A Focus on Problem Gambling

Results of the
2006/07 New Zealand Health Survey

Foreword

New Zealand continues to be a world leader in its approach to addressing gambling harm. Key to this approach is a strong research foundation that effectively and accurately focuses on those areas of most significance to problem gambling.

A Focus on Problem Gambling: Results of the 2006/07 New Zealand Health Survey examines in detail gambling behaviours in New Zealand, which sectors of the population are gambling, what they are gambling on and how much they are gambling and the social and health issues associated with problem gambling.

This information is central to the Ministry's role in preventing and minimising gambling harm and informing nationally and internationally on gambling patterns.

The report's findings, particularly that problem gambling continues to be a social and health issue in New Zealand and that Māori and Pacific peoples are disproportionately affected by gambling harm, are important areas for both policy initiatives at a central government level, and for the provision of intervention services and public health activities at the population level.

Comments on this report are welcome and should be directed to the National Problem Gambling Team, Minimising Harm Group, Population Health Directorate, Ministry of Health, PO Box 5013, Wellington.

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Contents

List of Tables

List of Figures

Executive Summary

Introduction

Problem gambling is a social and health issue in New Zealand that causes substantial problems for gamblers and the people around them, including family, whānau, friends, work colleagues and the wider community.

In New Zealand the Gambling Act 2003 was passed in September 2003. One of the key aims of this Act is to prevent and minimise the harm caused by gambling, including problem gambling. As part of its responsibilities under the Act the Ministry of Health has developed a strategic plan for preventing and minimising gambling harm (Ministry of Health 2005a). One of the key objectives in the strategic plan was to develop a programme of research and evaluation. The 2006/07 New Zealand Health Survey is a key source of information to fulfil the Ministry of Health's obligation to monitor the prevalence of problem gambling in New Zealand.

The 2006/07 New Zealand Health Survey involved interviews with 12,488 respondents aged 15 years and over who were usually resident civilians and living in permanent private dwellings in New Zealand. The questionnaire included the nine-question Canadian Problem Gambling Index (CPGI), an internationally recognised and widely used instrument for measuring the prevalence of low-risk, moderate-risk and problem gambling in a population.

This report presents key findings about problem gambling and gambling-related harm from the 2006/07 New Zealand Health Survey. The report provides evidence on: the level of gambling among the New Zealand population, key risk factors for problem gambling, other related health behaviours and outcomes, and people experiencing harm from other people's gambling.

Key findings

Past-year gambling

- Two in every three adults (65.3%) had gambled in the last 12 months.
- The gambling activities most widely participated in by adults during the previous 12 months were:
  - Lotto (55.2%)
  - Instant Kiwi (26.5%)
  - non-casino gaming machines (10.2%)
  - track betting (8.7%)
  - casino gaming machines (7.7%).
- Among people aged 15–17 years one in four (25.3%) had gambled in the last 12 months and one in six (17.5%) had played Instant Kiwi or other scratch tickets in the last 12 months, even though it is illegal for people younger than 18 years to purchase Instant Kiwi in New Zealand.

- From 2002/03 to 2006/07 there was a decrease in overall past-year gambling participation, and a decrease in past-year participation in the following activities: Lotto, Instant Kiwi, non-casino gaming machines, track betting and Keno (not in a casino). There was an increase in past-year sports betting.

Problem gambling

- The prevalence of problem gambling in New Zealand adults was 0.4%, representing an estimated 13,100 people aged 15 years and over.

- In addition, the prevalence of moderate-risk gambling was 1.3% among New Zealand adults, representing a further 40,900 adults.

- In total, 1 in 58 adults (1.7%) were experiencing either problem or moderate-risk gambling, representing approximately 54,000 adults in the total population.

Profile of people experiencing gambling problems

- People aged 35–44 years had a high prevalence of problem gambling (1.2%).

- Māori and Pacific adults were approximately four times more likely to be problem gamblers compared to males and females in the total population, after adjusting for age.

- The prevalence of problem gambling was higher for adults living in neighbourhoods of high deprivation than for adults living in neighbourhoods of low deprivation, after adjusting for age.

- Socio-demographic factors that were found in regression analysis to be significantly associated with problem gambling included:
  - being aged 35–44 years
  - identifying as being of Māori or Pacific ethnicity
  - having fewer educational qualifications
  - living in areas of higher neighbourhood deprivation.

Problem gambling and health

- Problem gambling was significantly associated with current smoking and hazardous alcohol consumption. Compared to people with no gambling problems, problem gamblers had:
  - 3.73 times the odds of being a current smoker
  - 5.20 times the odds of having hazardous drinking behaviour

  after accounting for possible confounding factors.

- Problem and moderate-risk gamblers were more likely to have a high or very high risk of an anxiety or depressive disorder (according to the K10 screen), compared to people with no gambling problems.

- Problem gamblers were more likely to have worse self-rated health, on a number of SF-36 health domains, compared to people with no gambling problems.

- Nine in ten (91.6%) problem gamblers had visited a general practitioner in the last 12 months, compared to eight in ten people with no gambling problems (81.2%).

- One in six problem gamblers (17.0%) had visited a psychologist, counsellor or social worker in the past 12 months, compared to 3.4% of people with no gambling problems.

Experiencing problems in the last 12 months due to someone's gambling

- Overall, 2.8% of people aged 15 years and over had experienced problems in the last 12 months due to someone's[1] gambling, representing about 87,000 adults.

- A large proportion of adults who had experienced problems due to someone's gambling in the last 12 months reported that the problems were due to gaming machines: either non-casino gaming machines (53.0%) or casino gaming machines (33.0%).

- Of those people who had experienced problems in the last 12 months due to someone's gambling, approximately 20% had not gambled in the last 12 months, 55% were recreational gamblers with no reported gambling problems, and 25% were either low-risk, moderate-risk or problem gamblers.

- There was a higher prevalence of experiencing problems due to someone's gambling among Māori adults, Pacific adults, and people living in neighbourhoods of high deprivation.

Conclusions

Overall, the results of this study indicate that problem gambling continues to be a social and health issue in New Zealand. The prevalence of problem gambling was 0.4%, with an additional 1.3% of adults identified as moderate-risk gamblers, who may or may not be experiencing harm due to their gambling. This represented 1 in 58 people (or an estimated 54,000 people) who were either problem or moderate-risk gamblers in New Zealand.

Furthermore, an estimated 87,000 adults had experienced problems due to someone's[1] gambling in the last 12 months. While these numbers are relatively small compared to the estimated number of adults with hazardous drinking behaviour (551,300) or who are current smokers (619,900) (Ministry of Health 2008a), this study has shown that there is still a burden of gambling-related harm in the New Zealand community.

Overall, the key findings from this study are as follows.

1. Māori and Pacific people experience more gambling-related harm.

2. People living in more deprived areas are more affected by problem gambling.

3. The results of this study will be useful to inform the provision of problem gambling intervention services and public health activity, as the study showed that:
   a. problem gamblers can be found in both urban and rural areas
   b. Māori and Pacific people appear to be under-represented in intervention services

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[1] 'Someone' can include oneself, if one is a gambler.

c.   people experiencing gambling problems are more likely than other people to be current smokers, have hazardous drinking patterns, have worse self-rated health, and have a high or very high probability of a mood or anxiety disorder.

This report has shown that gambling-related harm does not affect everyone in this country equally. The evidence suggests that gambling-related harm is disproportionately affecting Māori, Pacific people and people living in areas of higher socioeconomic deprivation. Furthermore, these inequalities were found not only for people experiencing gambling problems themselves, but also for the people experiencing problems due to someone's gambling, which may include family, whānau and the wider community. Given that the effects of problem gambling include financial and health problems, it would appear that gambling problems may perpetuate existing inequalities. It is therefore important that gambling-related harm – and in particular these existing inequalities – is addressed.

Chapter 1: Introduction

Introduction

Although gambling is generally considered to be a form of entertainment, for some people gambling can be problematic. Problem gambling has been defined as 'patterns of gambling behaviour that compromise, disrupt or damage health, personal, family or vocational pursuits' (Ministry of Health 2005a: 23). Gambling problems can have negative impacts on people's health, financial situation, relationships and general wellbeing, as well as affecting the people around them (Shaffer and Kidman 2004).

The Gambling Act 2003

In New Zealand a key aim of the Gambling Act 2003 is to prevent and minimise the harm caused by gambling, including problem gambling. The Gambling Act 2003 defines a problem gambler as 'a person whose gambling causes harm or may cause harm'. Under this Act, *harm* means 'harm or distress of any kind arising from, or caused or exacerbated by, a person's gambling; and includes personal, social, or economic harm suffered:

(i)   by the person; or

(ii)   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'.

Under the Act, the Ministry of Health has a responsibility for the prevention and minimisation of gambling-related harm. The Ministry has developed a strategic plan to fulfil this obligation, focusing on a public health approach (Ministry of Health 2005a). This strategy calls for population surveys to monitor the prevalence and incidence of problem gambling in New Zealand.

Objectives of report

This report presents the key findings from the problem gambling component of the 2006/07 New Zealand Health Survey, a national cross-sectional survey carried out by the Ministry of Health. The 2006/07 New Zealand Health Survey is a key source of information to fulfil the Ministry of Health's obligation to monitor the prevalence of problem gambling in New Zealand.

The objectives of this report are to:

- determine the prevalence of past-year participation in gambling in New Zealand in different population groups
- determine the prevalence of problem gambling in New Zealand in different population groups
- determine key risk factors for problem gambling in New Zealand
- investigate the prevalence of, and inequalities in, experiencing gambling-related harm

- where possible and valid, compare results with previous New Zealand and international studies.

Structure of report

- Chapter 1 provides an overview of the current gambling context in New Zealand, and a summary of information about problem gambling.

- Chapter 2 gives an overview of the data sources and methods used in this study.

- Chapter 3 focuses on past-year gambling behaviour, for overall participation in gambling and also by gambling activity. These more in-depth analyses have been provided because some forms of gambling are more associated with increased gambling-related harm.

- Chapter 4 examines the prevalence of problem gambling behaviour in New Zealand and the profile of people experiencing gambling problems. This chapter also looks at key risk factors for problem gambling.

- Chapter 5 focuses on health behaviours associated with problem gambling, including hazardous drinking, current smoking, fair or poor health and psychological distress. Descriptive analysis of self-rated health and past-year health service utilisation is also provided.

- Chapter 6 examines the prevalence of experiencing problems due to someone's gambling.

- Chapter 7 provides a discussion and conclusion based on the findings of this report.

- The Appendix presents additional tables of results.

This report adds to and extends the findings presented in *A Portrait of Health: Key results of the 2006/07 New Zealand Health Survey* (Ministry of Health 2008a).

Background

The following section gives a brief overview of gambling and problem gambling in New Zealand, covering:
- the availability of gambling opportunities in New Zealand
- expenditure on gambling
- the prevalence of problem gambling
- the number of people seeking help for their gambling problems.

Gambling availability in New Zealand

A wide range of gambling activities are available in New Zealand, including casino gambling, electronic gaming machines, Lotto, Instant Kiwi (scratch tickets), track betting, sports betting, Keno, housie (bingo), internet gambling and telephone gambling.

The number of casinos in New Zealand is limited to the current six by the Gambling Act 2003. Casinos were opened in Christchurch in 1994, Auckland in 1996, Dunedin in

1999, and Hamilton in 2002, with two casinos opening in Queenstown, in 1999 and 2000. Casinos provide table games and electronic gaming machines.

In addition, electronic gaming machines are available throughout New Zealand in licensed pubs, clubs and bars. These are collectively known as 'non-casino gaming machines', or NCGMs. In December 2008 there were 19,879 non-casino gaming machines in New Zealand, located at 1537 venues (Department of Internal Affairs 2009a). This represents a decrease in the number of NCGMs in New Zealand since the quarterly peak in June 2003, when there were 25,221 NCGMs located at 2122 venues (Figure 1).

Other forms of gambling in New Zealand include New Zealand Lotteries products, such as lotteries (Lotto and Big Wednesday), scratch tickets (Instant Kiwi) and Keno (not in a casino). Sports betting and track betting on horse and dog races can be carried out at TAB (Totalisator Agency Board) venues throughout New Zealand, and by phone, internet and interactive televisions. Housie, also known as bingo, is run by societies and individuals in New Zealand, in accordance with the Gambling Act 2003.

The Act set a legal age limit of 18 years of age for the gambling activities of Instant Kiwi, non-casino gaming machines and sports and race betting in New Zealand. A higher age limit of 20 years was imposed for all casino gambling (including tables and gaming machines).

Figure 1:   Number of non-casino gaming machines in New Zealand per year quarter, 31 December 1994 to 31 December 2008
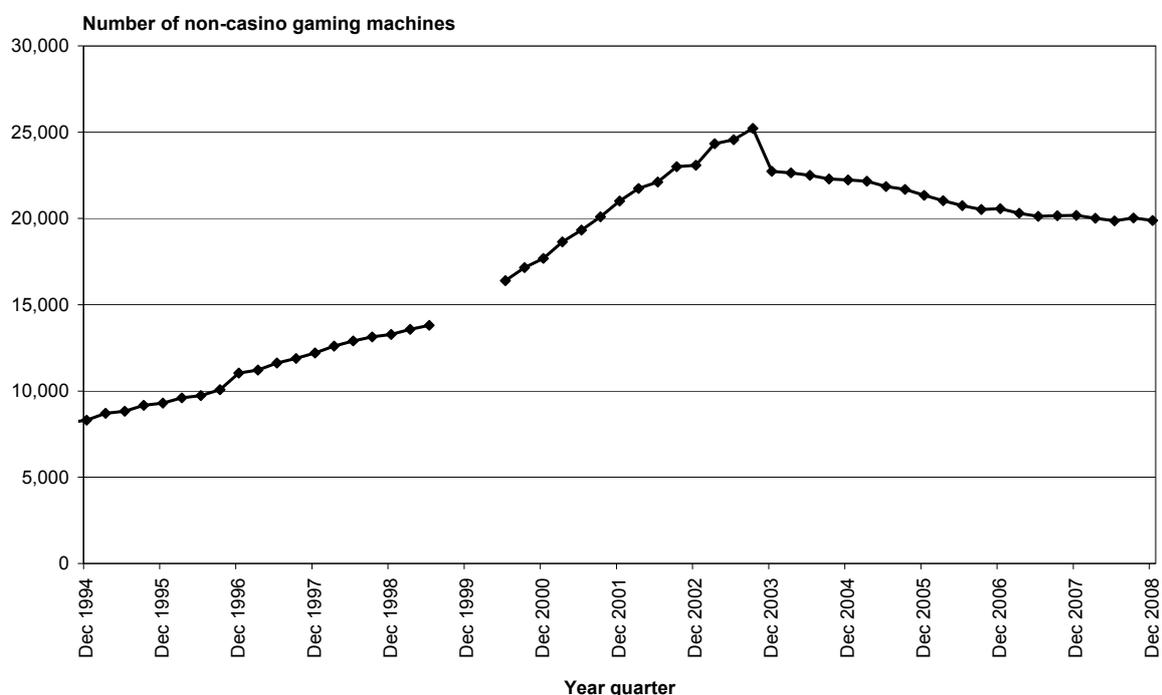
Source: Department of Internal Affairs 2009a

Note: Data were not available for the quarters September 1999 to March 2000.

Expenditure on gambling in New Zealand

In 2008 over two billion dollars ($2,034 million) was spent on gambling in New Zealand. Expenditure in 2008 increased slightly from 2007, when $2,020 million was spent on gambling (Figure 2), representing increases in expenditure on all forms of gambling except non-casino gaming machines. In 2008 expenditure on non-casino gaming machines made up almost half (46.1%, or $938 million) of the total expenditure on gambling in New Zealand. The other expenditure came from casinos (23.5%, or $477 million), lotteries (17.0%, or $346 million) and racing (13.4%, or $273 million) (Department of Internal Affairs 2009b).

Figure 2: Annual gambling expenditure in New Zealand, by gambling activity type, 1982–2008
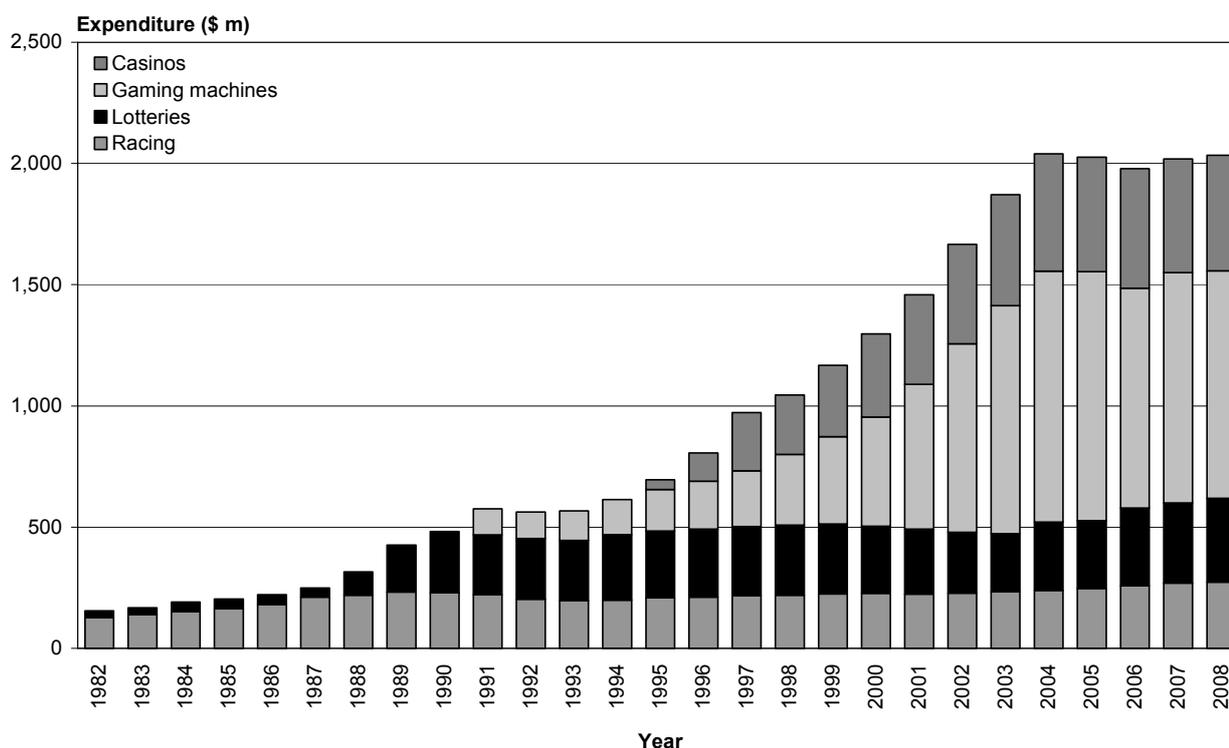
Source: Department of Internal Affairs 2009b

Note: Expenditure is the amount lost or spent by players, or the gross profit of the gaming operator. Expenditure represents actual dollars (non-inflation-adjusted) for gambling operators' financial year-end. Most gambling operators have a balance date of 30 June.

Gambling participation

Several studies have monitored gambling participation in New Zealand, including two national problem gambling prevalence studies (the 1991 national survey and the 1999 National Prevalence Survey) and a series of surveys on gambling participation.

The 1999 National Prevalence Survey found that 86.2% (95% confidence interval 85.2–87.2) of New Zealanders aged 18 years and over had gambled in the previous six months in 1999, showing a decrease from the 90% found in the 1991 national survey (Abbott and Volberg 1991, 2000). In these surveys, gambling included participation in a variety of gambling activities including Lotto, gaming machines, card games and making bets with friends.

Since 1985 the Department of Internal Affairs has run a survey every five years on participation in, and attitudes towards, gambling in New Zealand, among people aged 15 years and over. This series of surveys has found that past-year gambling participation rates have remained relatively stable over time, from 85% in 1985, to 90% in 1990, 90% in 1995, and 87% in 2000, although with a decrease to 80% in 2005 (Amey 2001; Christoffel 1992; Department of Internal Affairs 2008; Reid and Searle 1996; Wither 1987).

The 2006/07 Gaming and Betting Activities Survey, carried out for the Health Sponsorship Council, found that 83% of people aged 15 years and over had gambled in the past 12 months (including gambling activities such as making bets with friends) (Health Sponsorship Council and National Research Bureau 2007). In addition, the 2002/03 New Zealand Health Survey found that 69.4% (68.2–70.6) of New Zealanders aged 15 years and over had participated in the main forms of gambling in the last 12 months (which excluded gambling activities such as raffles, making bets with friends, and card games) (Ministry of Health 2006a).

Problem gambling

Gambling behaviour is generally thought of as being a continuum, ranging from no problems through to severe problems. Problem gambling has been defined as 'gambling behaviour that results in any harmful effects to the gambler, his or her family, significant others, friends, and co-workers' (National Research Council 1999: 21). The severest form of problem gambling, pathological gambling, is defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) as 'persistent and recurrent maladaptive gambling behaviour ... that disrupts personal, family or vocational pursuits' (American Psychiatric Association 2000: 671).

In New Zealand, the 1991 national survey estimated that 3.3% (2.6–4.3) of the adult population aged 18 years and over were current problem or pathological gamblers, according to the revised South Oaks Gambling Screen (SOGS-R) (Abbott and Volberg 1991). The 1999 National Prevalence Survey used the same screen to find a prevalence estimate for current problem and pathological gamblers of 1.3% (0.9–1.8) (Abbott and Volberg 2000). This suggested a decrease in the prevalence of problem gambling over that time, although the authors stated that the surveys were not strictly comparable, and that these results were likely to be conservative and should be interpreted with caution.

The 2002/03 New Zealand Health Survey also contained a short set of questions about gambling, including a 10-question problem gambling screen. This survey found a prevalence of problem gambling behaviour of 1.2% (1.0–1.5) among people aged 15 years and over (Ministry of Health 2006a). The problem gambling screen was developed for the survey and had not been used in any previous studies, and for this reason the results from this study were not directly comparable with the previous two surveys.

Risk factors for problem gambling

Although problem gambling affects people from all types of backgrounds, most studies have found demographic and socioeconomic risk factors for problem gambling. In New Zealand the 1991 national survey found risk factors for current problem gambling of being male, unemployed, under 30 years old, single, and of Māori or Pacific ethnicity (Abbott and Volberg 1991, 2000). The 1999 survey found a shift in some risk factors for current problem gambling, to include being in paid employment, lacking educational qualifications or having trade or vocational qualifications, living in Christchurch, being of Māori or Pacific ethnicity, being Catholic, living in a household with a total household income of $40,001–50,000, and being born outside New Zealand, Australia, Europe and North America (Abbott and Volberg 2000, 2001).

Similarly, the 2002/03 New Zealand Health Survey found key risk factors for current problem gambling of being aged 25–34 years, being of Māori or Pacific ethnicity, living alone, being less qualified, and being employed (Ministry of Health 2006a). Although the survey showed that problem gambling rates were higher for people living in the quintile of most socioeconomically deprived areas (1.9%, 1.3–2.4) compared to people living in the quintile of least deprived areas (0.8%, 0.3–1.3), regression analysis suggested that this difference was not statistically significant once ethnicity was taken into account (Ministry of Health 2006a). The survey showed that problem gambling rates did not differ between urban and rural areas, although people who lived in rural areas were significantly more likely to have gambled in the last year (75.1%, 71.9–78.3) compared to people living in urban areas (68.4%, 67.1–69.8) (Ministry of Health 2006a).

People seeking help for problem gambling

In New Zealand, problem gambling intervention services are available to people who are experiencing problems due to their own gambling or someone else's gambling. These services are for interventions across the continuum of support, and include:

- face-to-face intervention services
- a toll-free gambling telephone helpline ('Gambling Helpline').

Overall, the annual number of people seeking face-to-face counselling for their gambling peaked in the year ended 31 December 2004 for face-to-face gambling counselling (Figure 3), and around 2002–2004 for the Gambling Helpline (Figure 4) (Ministry of Health 2008b). In 2005 there was a substantial drop in the number of people seeking help from either type of service, although numbers appear to have been fairly stable since then.

Figure 3: Annual number of new full clients to face-to-face problem gambling intervention services, 1998–2007
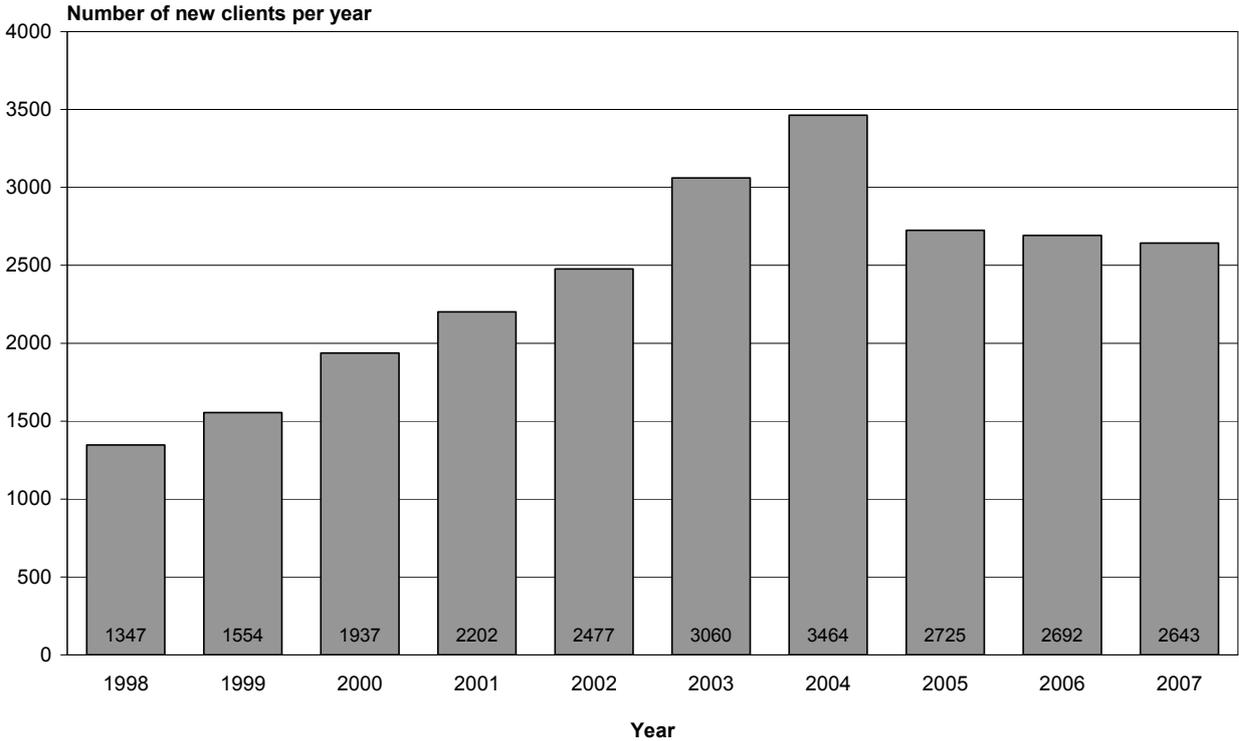
Source: Ministry of Health 2008b

Figure 4: Annual number of new callers to Gambling Helpline (gamblers), 1998–2007
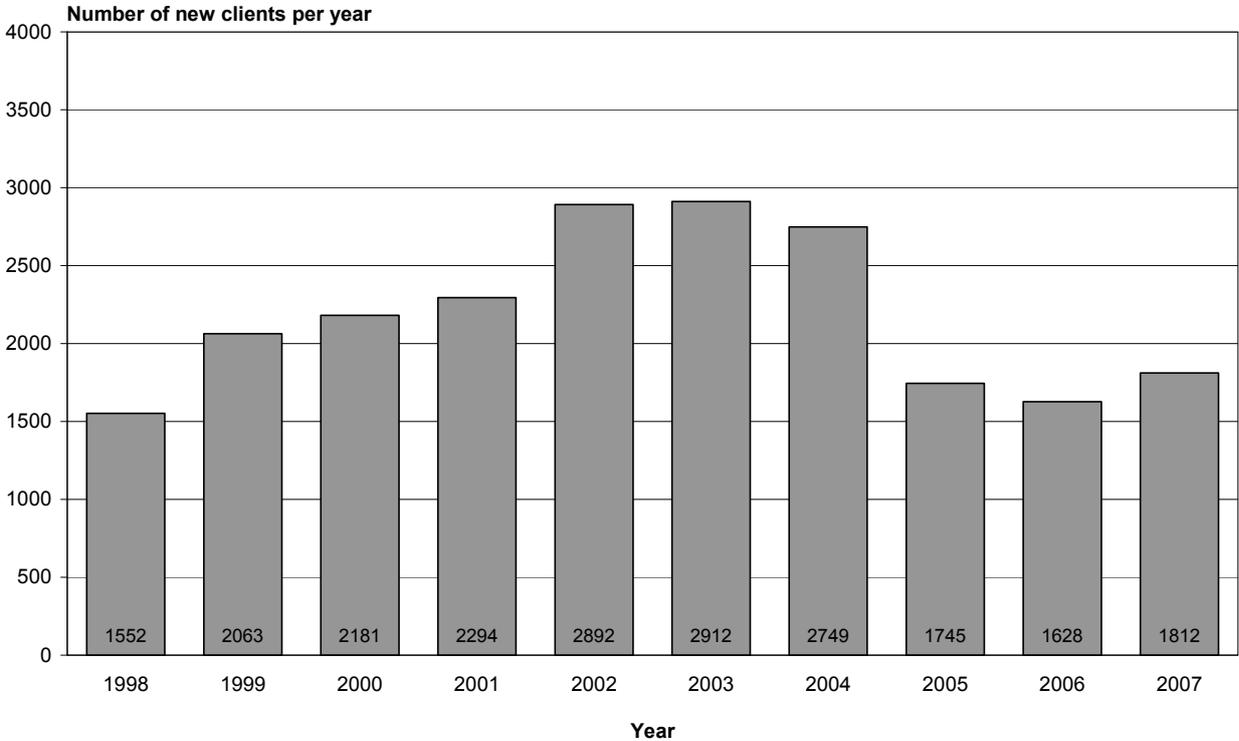
Source: Ministry of Health 2008b

In 2007 males comprised 57.1% of new full clients at face-to-face intervention services, and 51.3% of new callers to the Gambling Helpline (Ministry of Health 2008b). The age groups of 25–34 years and 35–44 years accounted for approximately half of the new clients to face-to-face intervention services and Gambling Helpline in 2007. Among new clients to face-to-face intervention services, NZ European/Pākehā made up 48.1%, Māori 28.6%, and Pacific people 7.2% (Ministry of Health 2008b).

It should be noted that the number of people seeking help for their gambling problems may not necessarily reflect the prevalence of problem gambling in the community. Help-seeking can depend on a variety of things, including ease of access, cost, level of severity of gambling problems, and capacity of services. However, help-seeking statistics can be a useful indicator of changes over time, and may also indicate possible gaps in service delivery.

Types of gambling activity

Electronic gaming machines, track betting and casino games have been cited as being more addictive and as causing more problems than other types of gambling such as lotteries, because they are forms of gambling that allow people to gamble continuously without stopping (Abbott and Volberg 2000). The majority of new clients at problem gambling intervention services in 2007 cited non-casino gaming machines as their primary mode of harmful gambling (66.8% of new clients to face-to-face services and 75.6% of new callers to Gambling Helpline) (Table 1). Overall, electronic gaming machines (both casino and non-casino) accounted for the primary mode of 76.5% of new face-to-face intervention clients, and 84.7% of new gambler callers to the Gambling Helpline (Ministry of Health 2008b).

Table 1: Primary mode of gambling for face-to-face problem gambling intervention services and Gambling Helpline, 2007

Primary mode of gambling	Face-to-face intervention services (% of new full clients)	Gambling Helpline (% of new gambler clients)
Non-casino gaming machines	66.8	75.6
Casino gaming machines	9.7	9.1
Casino tables	10.1	5.7
Track betting	3.4	5.5
Sports betting	3.0	1.5
Other	7.0*	2.5**

Source: Ministry of Health 2008b

* Includes Lotto/Keno/scratchies and other gambling.
** Includes other forms of gambling and multiple forms of gambling

Associations with problem gambling

Problem gambling can have negative impacts on many aspects of a person's life, including financial, personal, interpersonal and legal impacts, and impacts on their work and/or study (Productivity Commission 1999; Shaffer and Kidman 2004). For example, over half (51.1%) of new clients at New Zealand face-to-face problem gambling counselling services in 2007 had lost $1,000 or more on gambling in the four weeks prior to their first counselling assessment (Ministry of Health 2008b).

Problem gambling has also been shown to be associated with other risk behaviours. These include smoking (Abbott 2001; Ministry of Health 2006a; Petry and Oncken 2002; SERCIS 2001; Volberg et al 1999), alcohol problems and dependency (Abbott 2001; Ministry of Health 2006a; Toneatto et al 2002; Welte, Wieczorek, Barnes et al 2004; Welte, Wieczorek, Tidwell et al 2004), and drug use and dependency (Abbott 2001; Volberg et al 1999). Studies have also shown associations between gambling problems and reporting worse self-rated health (Ministry of Health 2006a; SERCIS 2001; Volberg et al 1999), and having more mental health issues (SERCIS 2001; Volberg et al 1999). Furthermore, a New Zealand study found a high prevalence of problem gambling (17%), according to the EIGHT problem gambling screen, among people admitted to the accident and emergency department of an Auckland hospital following a suicide attempt or self-harm episode (Penfold et al 2006).

Problem gambling can also result in harm to people other than the gambler, including their family, friends and the wider community. It has been estimated that between 7 and 17 people are affected by each problem gambler (Productivity Commission 1999).

These results suggest that problem gambling affects both the gambler and the people around them. The relationships between gambling problems and other aspects of health, such as the health behaviours of hazardous drinking and smoking, as well as worse self-rated health and mental health, emphasise the need to address these issues and to continue to work towards minimising gambling-related harm in the community.

Chapter 2: Data Sources and Methods

This chapter provides details on the data sources and methods used in this report. Further details on the methodology of the 2006/07 New Zealand Health Survey are available in the publications *A Portrait of Health: Key results of the 2006/07 New Zealand Health Survey* (Ministry of Health 2008a), and *Methodology Report for the 2006/07 New Zealand Health Survey* (Ministry of Health 2008c)*.

2006/07 New Zealand Health Survey

The 2006/07 New Zealand Health Survey is the fourth national health survey to be carried out in New Zealand. The survey collected information on adults aged 15 years and over, with an additional component relating to children aged 0–14 years. The survey measured self-reported physical and mental health status, including doctor-diagnosed health conditions, risk and protective behaviours for health outcomes, and the use of health care services among the usually resident non-institutionalised New Zealand population.

The New Zealand Health Survey is a key component of the New Zealand Health Monitor (NZHM), which is an integrated programme of household surveys and cohort studies managed by the Ministry of Health that monitors the health of the New Zealand population (Ministry of Health 2005b). It is also an important element of the cross-sector Programme of Official Social Statistics directed by Statistics New Zealand (Statisphere 2007).

The Ministry of Health developed the objectives and content of the 2006/07 New Zealand Health Survey, in consultation with stakeholders and an Independent Monitoring Group. The data collection was carried out by a specialist survey company, National Research Bureau, who undertook the interviewing and prepared the data sets. The Ministry of Health led the analysis and dissemination of the data.

The five overall objectives of the survey were to:

1. measure the health status of New Zealanders, and the prevalence of selected health conditions

2. measure the prevalence of risk and protective factors associated with these health conditions

3. measure the use of health services, including barriers to accessing health services

4. examine differences between population groups (as defined by age, gender, ethnicity, and socioeconomic position)

5. examine changes in key New Zealand Health Survey data over time.

The adult questionnaire in the 2006/07 New Zealand Health Survey included a set of questions about gambling and problem gambling. In particular, the survey collected information on past-year gambling participation, problem gambling behaviour, and whether the respondent had experienced problems due to someone's gambling.

Survey design

The target population for the 2006/07 New Zealand Health Survey was the usually resident civilian population of all ages living in permanent private dwellings in New Zealand. The sample frame excluded off-shore islands (those other than the North Island, South Island and Waiheke Island) due to the time and expense of getting to these places.

The survey had a complex multi-stage design. Firstly, a random sample of small areas (meshblocks) was selected, and from these a sample of households was selected, and from each household one adult and one child (if there were any residing in the household) were randomly selected with a Kish grid into the sample. Increased sampling was carried out for Māori, Pacific and Asian peoples to ensure sufficient sample sizes for these groups.

Data collection

The survey interviews were carried out between September 2006 and November 2007. The survey involved face-to-face interviews in people's homes, with a computer-assisted personal interview (CAPI).

The data collection, contracted to National Research Bureau, involved hiring, training and supervising approximately 120 interviewers. To ensure a good response rate, up to 10 call-backs were made on different days and at different times. Data cleaning and checking took place before accepting the final version of the data set.

The adult component of the survey resulted in a response rate of 68%. The final sample size for the adult component of the survey was 12,488 adults aged 15 years and over, which included 3160 Māori, 1033 Pacific, 1513 Asian and 8593 European/ Other adults.[2]

Data reliability

Two types of error are possible in an estimate based on a sample survey: sampling error and non-sampling error.

Estimates from this survey are subject to sampling error or variability because they are based on information that relates to a sample of persons rather than a full enumeration (census). That is, the estimates may differ from those that would have been produced if all the information had been obtained for all people in the population. The method used to calculate the sampling errors is outlined later in this chapter.

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[2]   Total response standard output for ethnic groups has been used, so these numbers will not add to the total sample size. See page 20 for more information on total response standard output.

Other inaccuracies are referred to as non-sampling errors, and may occur in any survey, regardless of whether it is a sample or full enumeration. Possible non-sampling errors include coverage errors, response bias and measurement errors. Although these elements cannot be measured, it is useful to be aware of them when interpreting the results of the survey. Also, significant effort is made to reduce non-sampling error by carefully designing and testing the survey, questionnaire and processes, and by ensuring quality control of procedures and data.

In the 2006/07 New Zealand Health Survey coverage errors may have occurred. Response bias may have occurred if there was differential non-response; that is, if the survey was less likely to be answered by certain people, such as a certain population group (eg, young males), or people who were not often home (which may have included heavy gamblers). The interview introduction was an important part of trying to ensure that people took part in the survey.

Measurement error might also have occurred in this survey. Many of the analyses in this report used self-reported information, which may have had some inaccuracies. Measurement errors include recall error (eg, mistakes made when respondents recall how often they have done something over the last 12 months), under- and over-reporting (which may be influenced by the respondent's perception of what is socially desirable), and item non-response (if the respondent does not answer certain questions).

Questionnaire

The 2006/07 New Zealand Health Survey collected information on the broad topics of health behaviours, chronic health conditions, health service utilisation and socio-demographics (Table 2). Where possible, questions were sourced from previous surveys. The full questionnaire for the 2006/07 New Zealand Health Survey is available online (www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health).

Table 2:   Summarised content of the 2006/07 New Zealand Health Survey adult questionnaire

Module	Topics	Details
Chronic health conditions	Heart disease, stroke, diabetes, asthma, chronic obstructive pulmonary disease, arthritis, spinal disorders, osteoporosis, cancer, mental health conditions, other long-term conditions, chronic pain	Prevalence of ever diagnosed, age of diagnosis, treatment
Health service utilisation	Primary health care, general practitioners, nurses, oral health care providers, medical specialists, prescriptions, complementary and alternative providers, other health care, telephone health advice, hospitals	Use in past 12 months, frequency of contact, reasons for visit, unmet need and barriers to access, measures of service for primary health care
Health risk and protective factors	High blood pressure, high blood cholesterol, cancer testing (breast, cervical and prostate), physical activity, tobacco smoking and second-hand smoke exposure, vegetable and fruit intake, alcohol, gambling	Prevalence
Health status	General health in past four weeks (physical and mental health), psychological distress	SF-36 Health Status Questionnaire and K10 Psychological Distress Scale
Socio-demographics	Gender, age, ethnicity, language, country of birth, education, income support, labour status, income, racial discrimination, household characteristics, living standards and deprivation characteristics	Standard questions and classifications
Anthropometry	Height, weight and waist circumference measurements	Using standardised equipment and procedures
Re-contact	Permission to re-contact within two years, contact details	

The module on health risk and protective factors included a set of questions about past-year gambling behaviour. This included questions about past-year participation in different types of gambling activities, problem gambling behaviour, and experiencing problems due to someone's gambling in the last 12 months.

All adult respondents were asked about which gambling activities they had participated in during the previous 12 months. They selected as many as applied from the following list:

- Lotto
- Instant Kiwi or other scratch tickets
- non-casino gaming machines
- track betting
- casino gaming machines
- sports betting
- casino table games
- Keno (not in a casino)
- housie
- internet-based gambling

- other gambling activity [specify].

The questionnaire did not specifically ask about participation in specific other forms of gambling (such as raffles), and therefore it is likely to have underestimated the prevalence of participation in 'other gambling activities'. For this reason, results have not been presented for other forms of gambling.

Measuring problem gambling

In population studies the prevalence of problem gambling is measured with a problem gambling 'screen'. These screens generally consist of a set of questions about gambling behaviour and gambling-related harm, which are scored to determine the likely problem gambling status of an individual. There is currently no 'gold standard' problem gambling screen in use internationally. In the past, commonly used screens included the South Oaks Gambling Screen (SOGS) (Lesieur and Blume 1987) and screens based on the Diagnostic and Statistical Manual of Mental Disorders criteria for pathological gambling (DSM-IV). However, these screens have been criticised for having been developed in a clinical setting rather than for population studies (Abbott and Volberg 1999). In New Zealand the 1991 and 1999 national problem gambling prevalence studies used the SOGS-R, a revised version of the SOGS developed for these surveys (Abbott and Volberg 1991, 2000). The 2002/03 New Zealand Health Survey used a set of gambling questions developed specifically for the survey (Ministry of Health 2006a).

For the 2006/07 New Zealand Health Survey it was decided to include the nine-question Problem Gambling Severity Index (PGSI), which is part of the Canadian Problem Gambling Index (CPGI) (Ferris and Wynne 2001). Developed in 2001, the full CPGI consists of 31 items, measuring frequency of gambling, adverse outcomes due to gambling in the last 12 months, and problems associated with gambling.

As part of this the CPGI includes a nine-item problem gambling screen, which measures the continuum of gambling problems, and can be used to derive the prevalence of:
- non-gambling
- non-problem gambling
- low-risk gambling
- moderate-risk gambling
- problem gambling.

The CPGI problem gambling screen has been used internationally in prevalence studies in Britain (Wardle et al 2007), Canada (Doiron 2006; Ministry of Public Safety and Solicitor General 2003; Smith and Wynne 2002) and Australia (AC Nielsen 2007; Queensland Treasury 2008). The CPGI was validated in 2001 in the Canadian adult population aged 18 years and over (Ferris and Wynne 2001).

In this current report, the term 'CPGI' is used to refer to the nine-question problem gambling screen (ie, the Problem Gambling Severity Index) that is part of the full CPGI questionnaire.

In the 2006/07 New Zealand Health Survey the CPGI was administered to all people aged 15 years and over who reported having gambled on one of the listed gambling activities in the last 12 months. Table 3 presents the nine CPGI problem gambling questions included as part of the 2006/07 New Zealand Health Survey. Each of these questions in the CPGI has four response options: 'never' (0 points), 'sometimes' (1 point), 'most of the time' (2 points) and 'almost always' (3 points). The points are summed for all nine questions, and the total score corresponds to a problem gambling level.

Table 3: Items in the nine-question Canadian Problem Gambling Index used in the 2006/07 New Zealand Health Survey

Area	Question
Loss of control	How often have you bet more than you could really afford to lose?
Motivation	Have you needed to gamble with larger amounts of money to get the same feeling of excitement?
Chasing	How often have you gone back another day to try to win back the money you lost?
Borrowing	How often have you borrowed money or sold anything to get money to gamble?
Problem recognition	How often have you felt that you might have a problem with gambling?
Criticism	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?
Feelings of guilt	How often have you felt guilty about the way you gamble or what happens when you gamble?
Negative effects on health	How often has gambling caused you any health problems, including stress or anxiety?
Financial problems	How often has your gambling caused any financial problems for you or your household?

Table 4 outlines the different levels of problem gambling risk derived from the CPGI problem gambling screen. For the purposes of this report, the term 'recreational gambler' has been used to describe past-year gamblers who did not report any gambling problems (that is, who were not low-risk, moderate-risk or problem gamblers according to the CPGI). However, it is acknowledged that gambling may also be a recreational activity for other gamblers.

Table 4: Scoring the nine-question Canadian Problem Gambling Index (CPGI)

Problem gambling level	Description	CPGI scores
Non-gambler	Did not gamble in the last 12 months.	Did not answer CPGI
Recreational gambler	Not experiencing any negative consequences of gambling. May gamble at low levels, or at social levels that are not problematic.	0

Low-risk gambler	Probably gambling at levels that are not leading to negative consequences.	1–2
Moderate-risk gambler	Gambling at levels that may or may not be leading to negative consequences.	3–7
Problem gambler	Gambling at levels that are leading to negative consequences. They may have lost control of their gambling behaviour.	8 or more (to a maximum of 27)

Source: Smith and Wynne 2002

For the purposes of this report, the CPGI score has been recorded as zero for respondents who had not participated on any of the ten main forms of gambling in the questionnaire, but who reported playing another gambling activity such as social gambling with friends. For this reason, prevalence estimates for problem gambling in this report may differ slightly from previously published results.

One measure of how well a screen works is the internal reliability. Analysis of the 2006/07 New Zealand Health Survey showed that the CPGI screen had good internal reliability, as indicated by the value for Cronbach's alpha of 0.89, where a value of greater than 0.7 is generally considered to show good reliability (Cronbach 1951; Graham and Lilly 1984).

Statistical methods

Weighting

Weights were used in all of the results presented in this report, so that estimates of population totals, averages and proportions can be said to be representative of the total resident population of New Zealand. A method called 'calibrated weighting' (Deville and Sarndal 1992) was used for weighting the 2006/07 New Zealand Health Survey. This results in:

- the weight being close to the inverse of the probability of selection of each participant
- the aggregated weights matching the known population counts for a range of sub-populations (eg, age-by-sex categories).

Calibrated weights were calculated using population counts from the 2006 Census, broken down by age, gender, District Health Board area and ethnic group. These variables were included in the calibration weighting because they are related to many health conditions and non-response, and are the output classifications for the survey. By using these variables in the calibration, if the sample differed from the population according to any of these categories, then the weighting corrected for the discrepancy. For example, if young men are under-represented in the sample relative to the census counts (as was the case due to non-response), the weights for young male participants are increased so that this group is correctly represented in estimates.

Sampling errors

Sampling error results from selecting a small number of people (a sample) in the population to represent the entire population, and is influenced by the complex design of

the survey (ie, some people had a higher chance of selection than others). Sample errors for survey estimates from this survey were calculated using a replicate method, called the delete-a-group jack-knife method (Kott 1998).

Ninety-five percent confidence intervals and p-values

Ninety-five percent confidence intervals have been used in this report to represent the sample errors for estimates. If multiple survey samples were obtained, even at the same time, they would provide results that differed. The 95% confidence interval is the interval that would be expected to contain the true population value 95% of the time, if many samples were taken. It should be noted that the confidence interval is influenced by the sample size of the group. When the sample size is small, the confidence interval becomes wider.

Ninety-five percent confidence intervals have been presented in parentheses after estimates in the text, and as error bars in graphs. The differences between variables are commented on in the text when they were found to be statistically significant at the 5% level. When the confidence intervals of two groups do not overlap, the difference in rates between the groups is statistically significant at the 5% level.

However, in some cases, when the confidence intervals of two groups overlap there may still be a statistically significant difference in rates, which can be formally tested for using a two-tailed t-test. In this report, if the confidence intervals overlap but the text reports the difference as being statistically significant (indicated by a p-value < 0.05), this indicates that the difference has been tested with a t-test.

The Korn and Graubard (1998) method was used to calculate 95% confidence intervals when only a small number of respondents (fewer than 30) answered 'yes' to a question, or when the original confidence interval included values outside the range 0–100%.

It should be noted that in this report the term 'significant' (or 'significance') refers to statistical significance.

Age-standardised rates

Unadjusted rates have been presented in this report for estimates of the prevalence in the total population and by age group. However, age is an important determinant of health, so populations with different age structures (eg, between men and women, due to women having a longer life expectancy) will have different rates due to these age differences. The statistical method of standardising for age has been used to adjust for the effects of any differences in the age distributions within population groups for some analyses. For this report, age standardisation was performed by the direct method using the World Health Organization (WHO) world population age distribution (Ahmad et al 2000).

Rate ratios

Age-standardised rate ratios have been presented in this report to compare each ethnic group with the total New Zealand population by gender (the reference group). The rate ratio graphs are explained in more detail at the end of this chapter.

Population estimates

Population estimates have been given for some analyses. These numbers reflect the true number of people affected by the outcome in the total population. However, readers should be aware that the survey only covered the usually resident population living in permanent private dwellings, so the survey did not include people living in institutions (such as prisons, hospitals, IHC and rest homes, and boarding schools), the homeless, short-term visitors and tourists.

Small numbers

Small numbers can affect both the reliability and confidentiality of results. Problems with reliability generally arise when the denominator (the number of people in the sample for a population group) is small, and consequently random variation is high, resulting in estimates that may change substantially if the survey was repeated. Problems with confidentiality can occur when it becomes possible to identify an individual, usually someone in a sub-group of the population within a small geographical area.

In order to ensure the survey data presented are reliable and that the confidentiality of the participants is protected, data have only been presented when the sample size in the denominator of a rate is at least 30. In most cases this has meant presenting the data in a sufficiently aggregated form and, in a small number of cases this has meant suppressing results for some cells in a table presented. Care has been taken to ensure that no participant can be identified in the results.

Logistic regression

Logistic regression was used to determine the significant risk factors associated with problem gambling behaviour, and to explore the associations between problem gambling and other health-related behaviours and outcomes. Appropriate methods and software were used to account for the complex sample design.

Risk factors for problem gambling were chosen based on the background literature review. The following risk factors were examined:
- sex
- age group
- prioritised ethnic group
- household composition
- education level
- employment status
- area-level deprivation
- urban/rural status.

The results for the regression analyses are presented as odds ratios. An odds ratio above 1 indicates a positive association (or 'risk factor'), while an odds ratio below 1

indicates a negative association (or 'protective factor'). An odds ratio is statistically significant if the confidence interval does not include 1 and the p-value is less than 0.05.

Prioritised ethnic groups were used in regression analysis because small numbers did not allow fitting a model with the appropriate main effects and interaction terms for total response ethnic groups (further information about the presentation of ethnicity data is presented in the following section). Household and personal income variables were considered for selection, but were not included because there was a high level of non-response for both of these questions. Reference groups were chosen for each risk factor, corresponding to the largest group or the group expected to have the lowest risk of problem gambling. Variables were retained in the model if they were significant at the p = 0.05 significance level, and interaction terms were examined.

Associations between problem gambling and other health-related outcomes were also explored using logistic regression. For each model, a health behaviour was selected as the dependent variable, and the model included a problem gambling variable, as well as controlling for other variables that may have been confounding the results. Interaction terms between potential confounding variables were tested using forward selection, and were included if they changed the odds ratio estimate for the problem gambling levels by 10% or more (according to the change-in-estimate methodology) compared to the full model (Rothman and Greenland 1998), or if they were considered to be important for overall model fit. Interaction terms between problem gambling and confounder variables were also tested. Model diagnostics were checked for all models. Analysis was carried out with SAS v9.1 and SUDAAN v9.01.

Data presentation

Demographic breakdowns

Descriptive analyses have been reported by key demographics, which include:

- gender: male and female
- ethnicity: Māori, Pacific, Asian and European/Other (total response ethnicity unless noted otherwise)
- age group: 15–17, 18–24, 25–34, 35–44, 45–54, 55–64, 65+ years
- neighbourhood deprivation: NZDep2006 quintiles based on meshblocks
- urban/rural classification: main urban, secondary urban, minor urban, rural areas.

Gender analyses

Data in this report have been presented by gender. Where statements regarding differences between males and females are made, the data have been age-standardised to account for the different age structures of the male and female populations.

Age group analyses

Data in this report have been presented by age group. For the purposes of the 2006/07 New Zealand Health Survey, adults were defined as being 15 years and over, and the majority of results in this report are for adults aged 15 years and over. However, the age limit for some gambling activities in New Zealand is 18 or 20 years. For this reason, some prevalence estimates for past-year gambling participation have been provided in the appendix for the total population aged 18 years and over, and for the total population aged 20 years and over.

Ethnic group analyses

Descriptive results in this report have been presented by total response ethnic group. Ethnicity is self-defined, and respondents were able to report affiliation with up to nine different groups, using the Statistics New Zealand standard ethnicity question and Level 4 response categories; 1578 adult participants (12.7%) in the 2006/07 New Zealand Health Survey reported more than one ethnic group.

For this report respondents' Level 4 ethnicity was aggregated to the following ethnic groups: European/Other, Māori, Pacific and Asian. Respondents were counted in each of the four aggregated ethnic groups they reported, and can be reported in more than one of the categories. For this reason, the sum of the individual ethnic group population totals may exceed the overall New Zealand population total. These ethnic groups are the most appropriate for representing valid multiple ethnic group data in the restricted space of this report (Callister et al 2007). In analyses presented here, the 'Other' ethnic group (comprising mainly Middle-Eastern, Latin-American and African ethnicities) has been combined with 'European' to avoid small number problems.

Because the ethnic groups used in this report are not independent, rate ratios have been presented which compare each ethnic group with the total New Zealand adult population, by gender (the reference group). The reference group does not represent 'the best health outcome group', but provides an indication of the current level in New Zealand for comparison. Readers should note that ethnic groups should not be compared with each other (eg, comparing Māori and Pacific data) using these analyses.

The unadjusted prevalence rates for most indicators have been presented to show the burden on different population groups, and to present population counts of the number of people affected.

In the logistic regression analyses prioritised ethnic groups were used. This method of reporting ethnic groups means that when a respondent identifies with two or more ethnic groups, the respondent was assigned to only one ethnic group in the prioritised order of Māori, Pacific, Asian and European/Other, according to the *Ethnicity Data Protocols for the Health and Disability Sector* (Ministry of Health 2004). For the purposes of this research, these were considered to be sufficient to represent ethnic groups while working within the limitations of small numbers. In these analyses ethnic group results can be compared.

Socioeconomic deprivation analyses

Analyses in this report have been presented by neighbourhood socioeconomic deprivation, as measured by the NZDep2006 Index of Deprivation (NZDep2006) quintiles. NZDep2006 is an area-based index of deprivation that measures the level of socioeconomic deprivation for each neighbourhood (meshblock) according to a combination of the following 2006 Census variables: income, benefit receipt, transport (access to car), household crowding, home ownership, employment status, qualifications, support (sole-parent families), and access to a telephone (Salmond et al 2007).

The predecessors of NZDep2006 (NZDep91, NZDep96 and NZDep2001) have been validated. This means that the index accurately describes levels of deprivation in small areas and is highly correlated with key health outcomes and behaviours, such as mortality and smoking (Crampton et al 2004). All analyses using NZDep2006 in this report have been adjusted for the differing age distributions within NZDep2006 quintile populations.

In the logistic regression analysis, results have been presented by NZDep2006 quintiles, as well as by education qualifications (no school qualification, school qualification and post-school qualification) and employment status (working, unemployed and not in the labour force). Household and personal income were not included in the analysis because there was a large amount of item non-response for these questions in the survey.

Urban/rural classification analyses

Data in this report have been presented by urban/rural classification (Department of Statistics 1992). This has been measured with the meshblock definitions derived in the 2006 Census. The following groups have been used:

- main urban areas (towns and cities with a minimum population of 30,000 people; eg, Whangarei, Auckland, Hamilton, Tauranga, Rotorua, Wellington, Nelson, Christchurch, Dunedin, Invercargill)

- secondary urban areas (towns with a population between 10,000 and 29,999 people; eg, Pukekohe, Tokoroa, Whakatane, Taupo, Levin, Blenheim, Greymouth, Timaru)

- minor urban areas (towns with a population between 1000 and 9999 people; eg, Kaitaia, Paeroa, Morrinsville, Dannevirke, Picton, Westport, Queenstown)

- rural areas (population of 999 people or less).

Comparisons with previous studies

Some comparisons of gambling participation have been made between the 2002/03 and the 2006/07 New Zealand Health Surveys. For these comparisons the 2002/03 New Zealand Health Survey data were reanalysed to ensure comparability with the 2006/07 New Zealand Health Survey data, and statistical tests for difference have been undertaken. Age-standardised rates were used to control for differing age structures of the population.

It should be noted that there are many difficulties in comparing prevalences of problem gambling from studies that have used different screens. Screens can measure different aspects of problem gambling, and generally have different scoring systems and thresholds. This limits comparability of prevalence estimates of problem gambling. Furthermore, when comparing international studies that have used the same problem gambling screen, results should be interpreted with caution because studies have different methodologies and population groups.

As a result, it is not possible to compare the estimates of problem gambling from the 2006/07 New Zealand Health Survey with those from previous New Zealand prevalence surveys due to the change in methodology used to measure problem gambling. Previous national problem gambling prevalence studies in New Zealand include the 1991 National Prevalence Study (Abbott and Volberg 1991), the 1999 National Prevalence Study (Abbott and Volberg 2000), and a section on gambling included in the 2002/03 New Zealand Health Survey (Ministry of Health 2006a). The 1991 and 1999 studies used a revised version of the South Oaks Gambling Screen (SOGS–R), and the 2002/03 New Zealand Health Survey used a set of questions developed specifically for the survey. Due to the difference in methodologies and problem gambling screens, it is not valid to compare the prevalence of problem gambling from these previous studies with that from this current study.

In the appendix prevalence estimates for problem gambling have been provided for a number of countries where similar surveys using the CPGI have been carried out. However, these comparisons must be interpreted with caution due to differences in survey design, age groups, time periods and methodologies (including telephone interviewing versus face-to-face interviewing).

Further advice for readers

The 2006/07 New Zealand Health Survey is a cross-sectional survey of the population, which can be used to examine associations between health states, individual health risk and protective behaviours and socio-demographic characteristics. Readers of this report need to be aware that associations do not necessarily imply causality. For example, if the survey finds that a particular behaviour is more common in people living in deprived areas, an association has been identified. This does not mean the condition is caused by living in a deprived area. In particular, associations between current health states and current behaviour, or current socio-demographic characteristics, need to be interpreted with caution, as current health states may reflect past rather than present behaviour, or childhood circumstances.

Readers should also be aware that the 2006/07 New Zealand Health Survey only includes the usually resident population living in private dwellings, so people living in institutions (hospitals, IHC and rest homes, prisons, boarding schools), the homeless, short-term visitors and tourists are not included.

Care and diligence have been taken to ensure the information in this report is accurate. The Ministry of Health accepts no liability for the accuracy of the information nor for its use or the reliance placed on it. If you suspect an error in any of the data contained in this report, please contact the author.

To see the data for all analyses presented in this report, please go to www.moh.govt.nz, where you can access the data tables online in Excel format.

How to interpret graphs in this report

Bar graphs

The following diagram shows how to interpret the bar graphs presented in this report.

The caption provides information about what the graph is about, and whether the data are unadjusted or age standardised.

The legend shows who is represented by the different colours on the graph.

The bar indicates the prevalence for each population group.

Figure X: Gambling in the last 12 months, by age group and gender (unadjusted prevalence)

Source: 2006/07 New Zealand Health Survey

Notes: Age standardised to WHO world population. Reference group, with a rate ratio of 1.0 (indicated by the bold line), is the total male or female population aged 15 years and over. Total response standard output for ethnic groups has been used.

The notes provide essential information about the graph, such as the data source.

This number is the value for the prevalence (%) for each data point.

The vertical line indicates the 95% confidence interval for the prevalence estimate. If two confidence intervals do not overlap, the difference between the two prevalence estimates is statistically significant. However, in some cases, two prevalences can be statistically significant even if the confidence intervals overlap.

Rate ratio graphs

The following diagram shows how to interpret the rate ratio graphs presented in this report.

The title provides information about what the graph is about, and that the data are age standardised.

The legend shows who is represented by the different shapes and colours on the graph.

This point indicates where the data point lies, compared to all males or females in the total population.

Figure Y: Gambling in the last 12 months, by ethnic group and gender (age-standardised rate ratio)

The bold line shows where the value is for males and females in the total population.
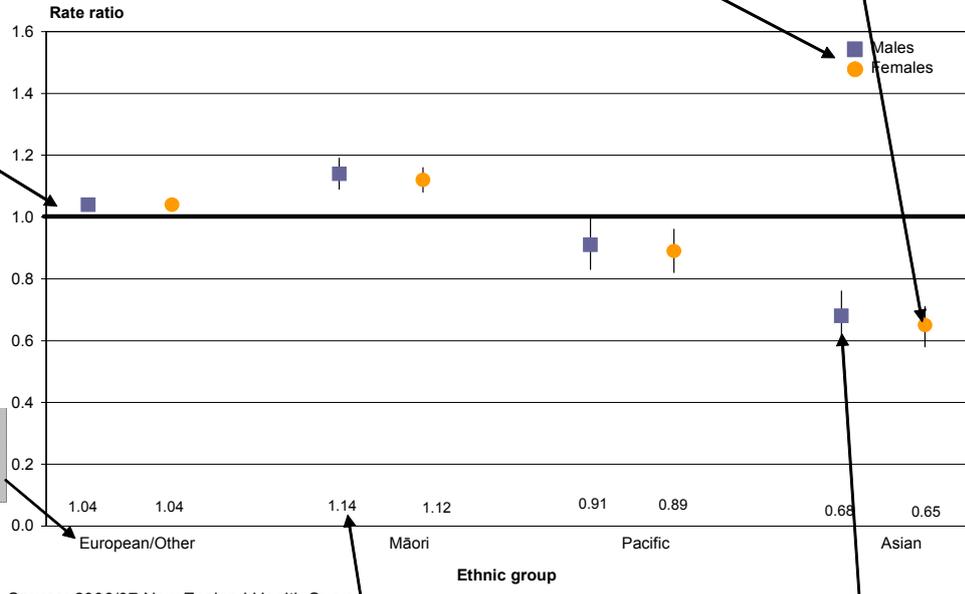
These labels indicate which ethnic group the data points are for.

Rate ratio

■ Males
● Females

	1.6
	1.4
	1.2
	1.0
	0.8
	0.6
	0.4
	0.2
	0.0

1.04   1.04   1.14   1.12   0.91   0.89   0.68   0.65

European/Other   Māori   Pacific   Asian

Ethnic group

Source: 2006/07 New Zealand Health Survey

Notes: Age standardised to WHO world population. Reference group, with a rate ratio of 1.0 (indicated by the bold line), is the total male or female population aged 15 years and over. Total response standard output for ethnic groups has been used.

The notes provide essential information about the graph, such as the standard population used in age standardisation, the reference group the rates are compared with, and what type of ethnic group has been used.

This number is the value for the standardised rate ratio for each data point.

The vertical line is the 95% confidence interval. If this line does not cross the bold line at 1.0, there is a statistically significant difference between the rate for this group and the rate for all males or females in the total population.

Chapter 3: Past-Year Gambling Participation

Key findings

- Two in every three adults (65.3%, 95% confidence interval 64.2–66.5) had gambled in the last 12 months.

- The most popular form of gambling was Lotto, with over half of all adults (55.2%, 54.0–56.4) having played Lotto in the last 12 months.

- The second most popular form of gambling was Instant Kiwi and other scratch tickets, with one in four adults (26.5%, 25.5–27.6) having played Instant Kiwi or other scratch tickets in the last 12 months.

- One in ten people (10.2%, 9.5–10.9) had gambled on non-casino gaming machines in the last 12 months.

- In the last 12 months, among people aged 15–17 years:
  - one in four (25.3%, 20.6–30.1) had gambled
  - one in six (17.5%, 13.1–21.8) had played Instant Kiwi or other scratch tickets, even though it is illegal for people aged under 18 to purchase Instant Kiwi tickets.

- Past-year participation in gambling had significantly decreased since 2002/03 among adults aged 15 years and over, from 69.4% (68.2–70.6) in 2002/03 to 65.3% (64.2–66.5) in 2006/07. There were similar differences after adjusting for age.

- In particular, past-year participation had significantly decreased from 2002/03 to 2006/07 in Lotto, Instant Kiwi, non-casino gaming machines, track betting and Keno (not in a casino), adjusting for age.

Introduction

Participation in gambling can differ markedly between population groups. Some forms of gambling (ie, continuous forms) are more linked with gambling problems than others (Abbott and Volberg 2000). These are types of gambling activities where a person can keep gambling without stopping, and include activities such as electronic gaming machines, track betting, casino gambling and scratch tickets.

The 2006/07 New Zealand Health Survey asked respondents aged 15 years and over whether they had participated in specific types of gambling activities in the previous 12 months (Question 3.41). Multiple responses were allowed.

The question asked about past-year participation in the following gambling activities:

- 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 (excluding office sweepstakes)
- sports betting at the TAB or with an overseas betting organisation
- gaming machines or pokies at one of the six casinos
- table games or any other games at one of the six casinos
- gaming machines or pokies in a pub or club (not in a casino)
- internet-based gambling
- other gambling activity.

Gambling participation

Overall, two in every three people aged 15 years and over (65.3%, 64.2–66.5) had gambled in the last 12 months. Lotto was the most commonly played form of gambling, with over half (55.2%, 54.0–56.4) of adults having played Lotto in the last 12 months (Table 5). Two in every five adults had participated in a gambling activity other than Lotto in the last 12 months (40.5%, 39.3–41.6).

One in four adults had played Instant Kiwi or other scratch tickets in the last year (26.5%, 25.5–27.6), while one in 10 adults had played on non-casino gaming machines in that time (10.2%, 9.5–10.9). Other gambling forms participated in included track betting (8.7%, 7.9–9.4), casino gaming machines (7.7%, 7.0–8.4) and sports betting (5.2%, 4.7–5.7). When looking at past-year gamblers, over one in three (38.0%, 36.6–39.4) had only gambled on Lotto in the last 12 months.

Table 5: Past-year participation in specific types of gambling activities, total population aged 15 years and over (unadjusted prevalence)

Gambling activity	Past-year participation (95% CI)		
	Prevalence (%) for total adults	Prevalence (%) for past-year gamblers	Estimated number of people
Any gambling activity	65.3 (64.2–66.5)	100.0	2,038,500 (2,003,500–2,075,300)
Any non-Lotto gambling activity	40.5 (39.3–41.6)	61.9 (60.6–63.3)	1,262,400 (1,226,400–1,298,200)
Lotto only	24.8 (23.8–25.8)	38.0 (36.6–39.4)	774,700 (742,700–805,100)
Lotto	55.2 (54.0–56.4)	84.5 (83.6–85.5)	1,722,900 (1,685,200–1,760,100)
Instant Kiwi or other scratch ticket	26.5 (25.5–27.6)	40.6 (39.3–42.0)	828,300 (795,800–861,300)
Non-casino gaming machines	10.2 (9.5–10.9)	15.6 (14.5–16.6)	317,700 (296,500–340,200)
Track betting	8.7 (7.9–9.4)	13.2 (12.2–14.3)	270,100 (246,500–293,300)
Casino gaming machines	7.7 (7.0–8.4)	11.8 (10.8–12.8)	240,800 (218,400–262,100)
Sports betting	5.2 (4.7–5.7)	8.0 (7.3–8.7)	162,700 (146,700–177,900)
Casino table games	2.1 (1.8–2.5)	3.3 (2.7–3.8)	66,500 (56,200–78,000)
Keno (not in a casino)	1.6 (1.3–1.8)	2.4 (2.1–2.8)	49,000 (40,600–56,200)
Housie	1.5 (1.3–1.8)	2.3 (2.0–2.7)	47,600 (40,600–56,200)
Internet-based gambling	0.4 (0.3–0.5)	0.6 (0.4–0.8)	12,600 (9,400–15,600)
Any gaming machine (casino or non-casino)	15.0 (14.3–15.8)	23.0 (21.9–24.2)	469,300 (446,300–493,100)
Any casino gambling (table games or gaming machines)	8.8 (8.1–9.5)	13.4 (12.4–14.5)	274,100 (252,800–296,500)

Source: 2006/07 New Zealand Health Survey

Number of gambling activities participated in during last 12 months

Overall, one in three adults (34.7%, 33.5–35.8) had not gambled in the last 12 months. A further one in three adults (32.4%, 31.3–33.5) had only participated in one form of gambling in the last 12 months (Table 6). By contrast, one in twenty adults (4.9%, 4.4–5.4) had participated in four or more types of gambling activity in the last 12 months.

Table 6: Number of gambling activities participated in during last 12 months, total population aged 15 years and over (unadjusted prevalence)

Number of gambling activities in last year	Past-year participation (95% CI)	
	Prevalence (%) for total adults	Prevalence (%) for past-year gamblers
0	34.7 (33.5–35.8)	–
1	32.4 (31.3–33.5)	49.6 (48.2–51.1)
2	19.8 (18.9–20.7)	30.3 (29.0–31.6)
3	8.2 (7.7–8.7)	12.6 (11.8–13.3)
4 or more	4.9 (4.4–5.4)	7.5 (6.8–8.3)

Source: 2006/07 New Zealand Health Survey

Table A1 in the appendix presents further information about past-year gambling, examining the number of gambling activities participated in during the last 12 months, by past-year gambling participation group.

Profile of past-year gamblers

The following section examines the profile of people who had gambled in the past 12 months. It focuses on general participation in gambling, as well as participation in specific gambling activities, particularly those activities more widely participated in. Comparisons for some population groups have been carried out using age-standardised rates to control for the different age structures of the population groups. All rates (unadjusted and age-standardised) are available on the web tables www.moh.govt.nz.

By gender

There was no significant difference in overall past-year participation in gambling between males and females, after adjusting for age (Figure 5). However, there were differences in the types of gambling activities that males and females had participated in. When adjusting for age, males were significantly more likely than females to have gambled on the following activities in the previous 12 months:

- non-casino gaming machines
- track betting
- sports betting
- casino tables
- internet gambling.

By comparison, females were significantly more likely than males to have participated in Instant Kiwi and housie in the last 12 months.

Figure 5: Past-year participation in specific gambling activities, by gender, total adult population (age-standardised prevalence)
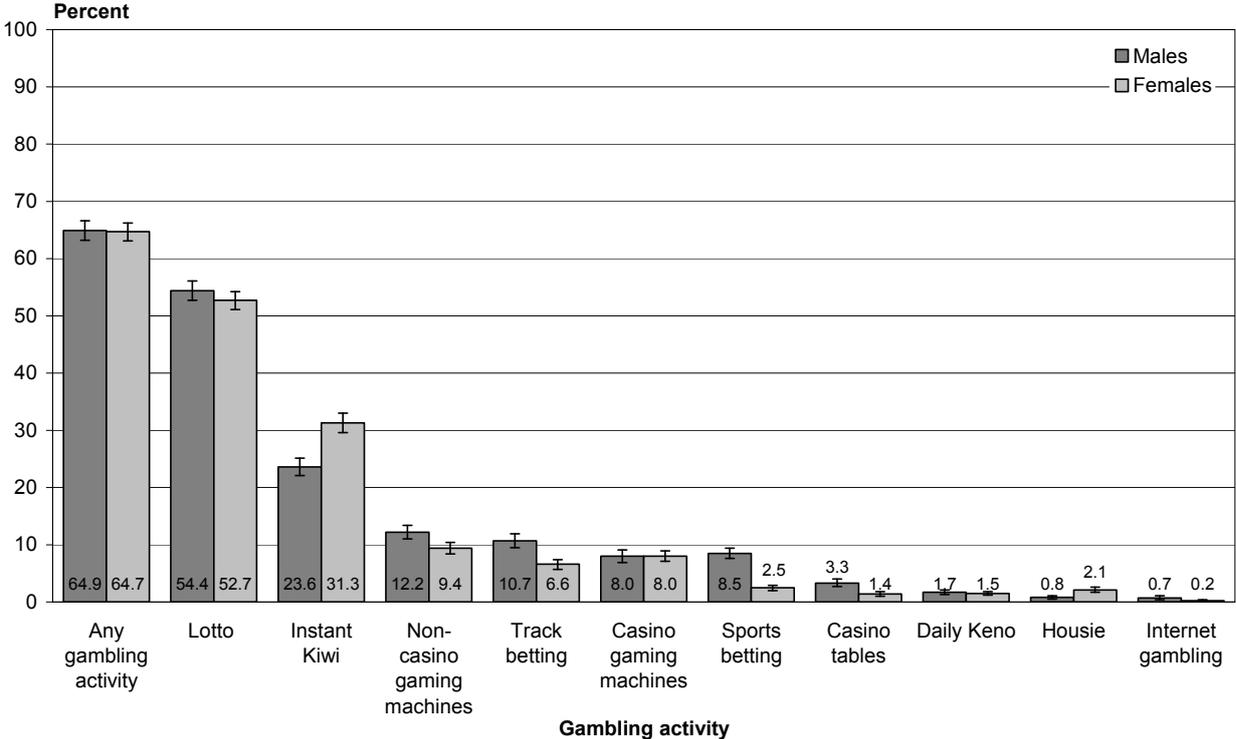
Source: 2006/07 New Zealand Health Survey

By age group

For males and females, past-year gambling participation was generally lower in the younger (aged 15–17 years) and older (aged 65 years and over) age groups than in other age groups (Figure 6). Overall, for people aged 35–64 years there were similar past-year gambling participation rates.

Figure 6: Gambling in the last 12 months, by age group and gender (unadjusted prevalence)
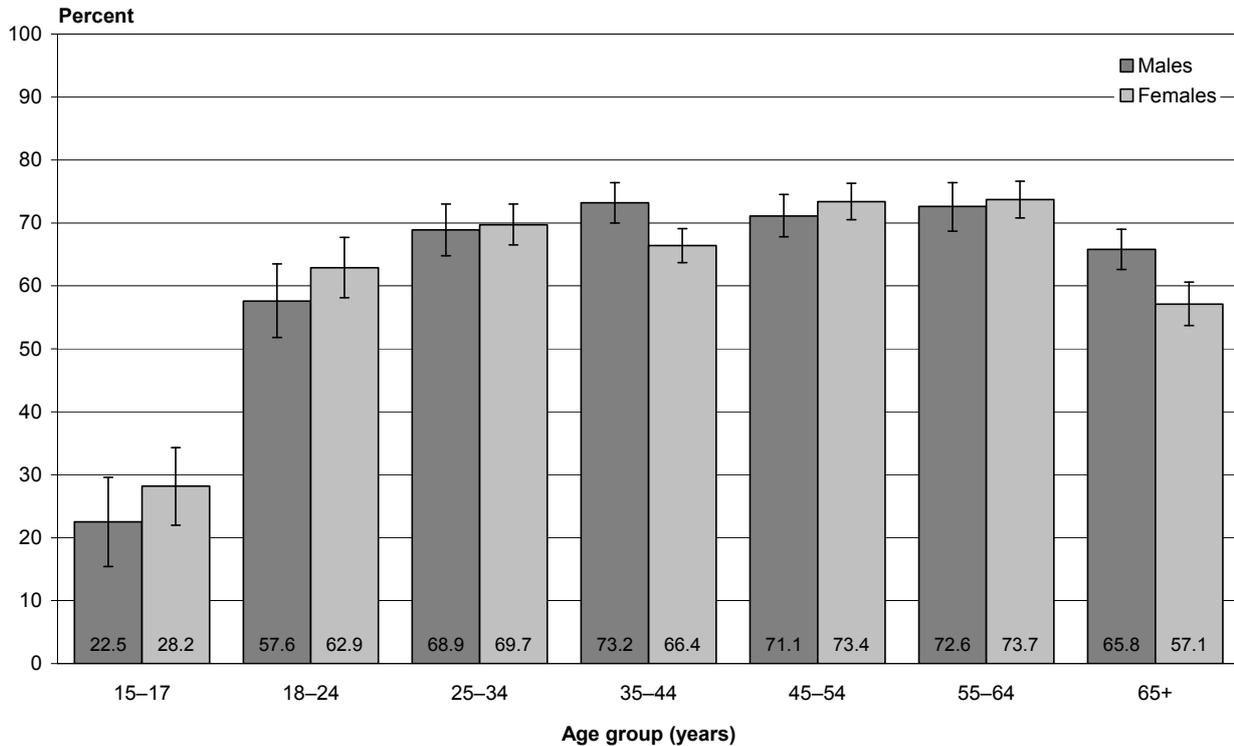
Source: 2006/07 New Zealand Health Survey

When examining different types of gambling activity, there were significant differences between age groups (Table 7). For example, people aged 35–64 years were generally more likely to have played Lotto in the last 12 months than people in other age groups (Figure 7).

Figure 7:   Gambling on Lotto in the last 12 months, by age group and gender (unadjusted prevalence)
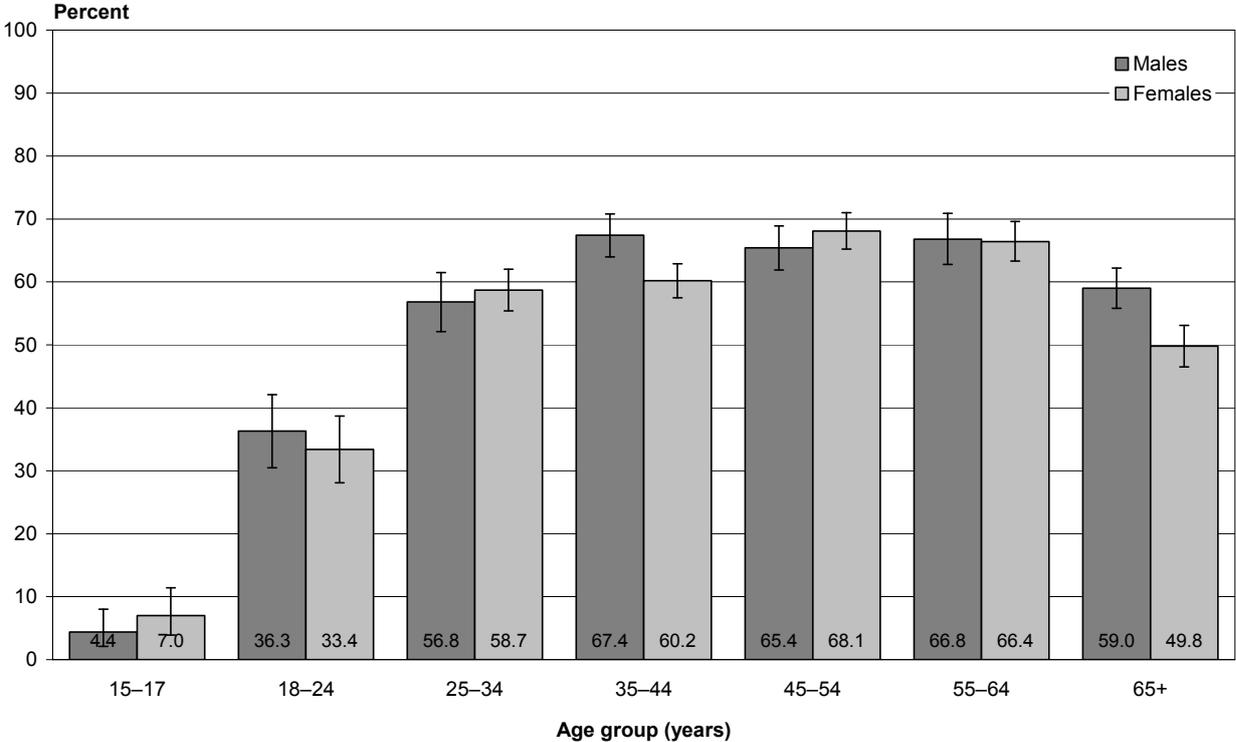
Source: 2006/07 New Zealand Health Survey

The highest participation in Instant Kiwi was in the age groups 18–24 years (36.8%, 33.3–40.4) and 25–34 years (33.9%, 31.1–36.6) (Table 7). Figure 8 shows that in several age groups females were significantly more likely than males to have played Instant Kiwi in the past year.

Figure 8:   Gambling on Instant Kiwi in the last 12 months, by age group and gender (unadjusted prevalence)
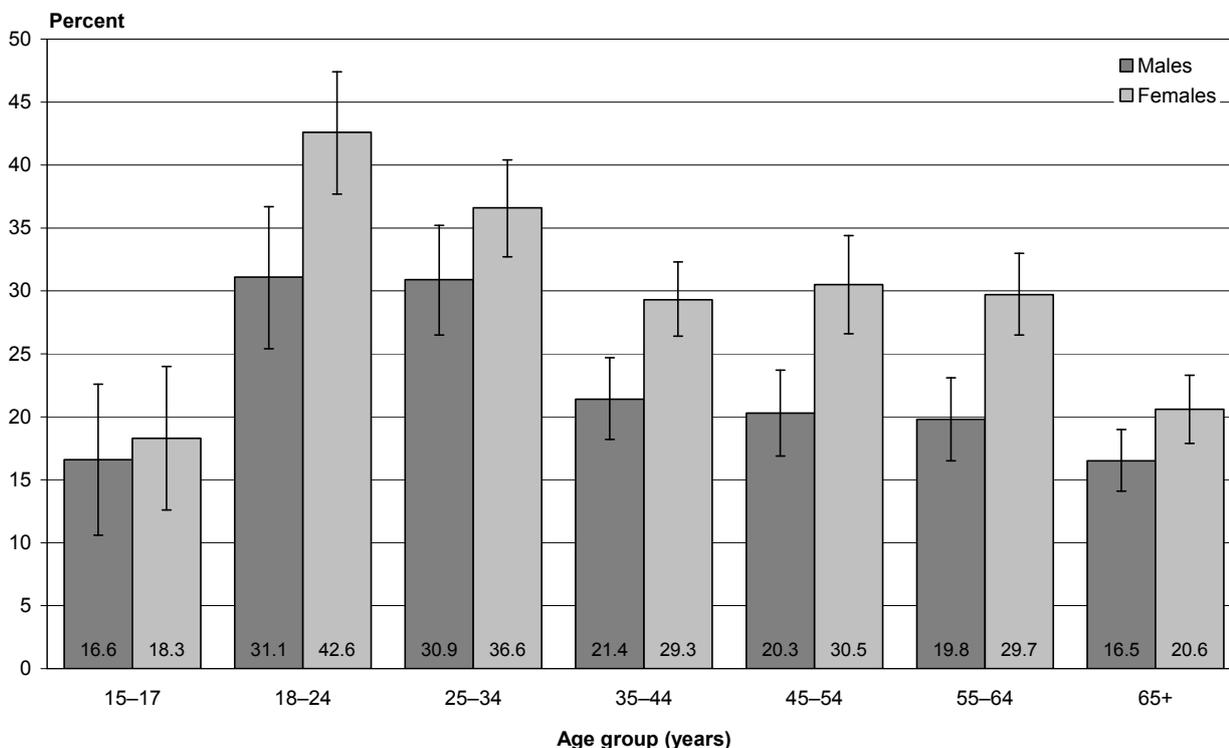
Source: 2006/07 New Zealand Health Survey

Similarly, the highest participation in non-casino gaming machines was among people aged 18–24 years (17.4%, 14.5–20.3) and 25–34 years (13.4%, 11.5–15.3) (Table 7). In particular, Figure 9 shows that for both males and females the age group 18–24 years had high participation in non-casino gaming machines, with participation decreasing with increasing age.

Figure 9: Gambling on non-casino gaming machines in the last 12 months, by age group and gender (unadjusted prevalence)
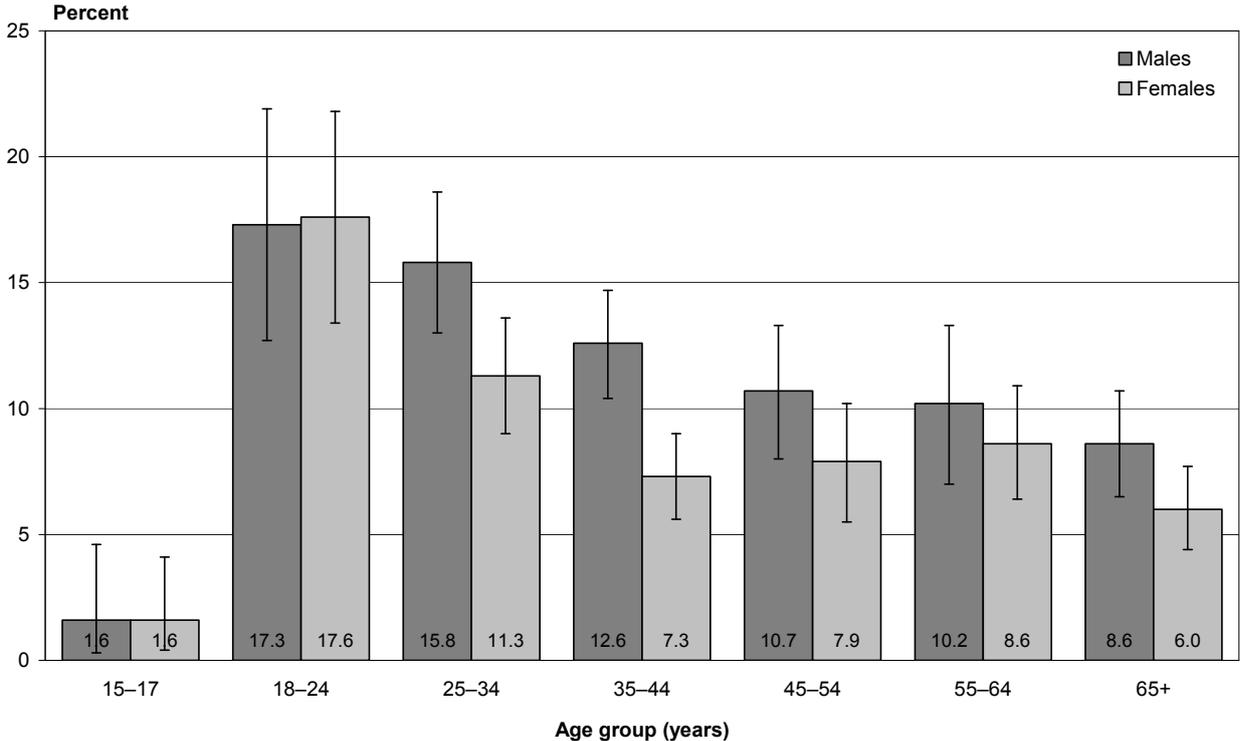
Source: 2006/07 New Zealand Health Survey

One in four people aged 15–17 years (25.3%, 20.6–30.1) had gambled in the last 12 months (Table 7). In this age group the highest participation rate was in Instant Kiwi, with one in six people aged 15–17 years (17.5%, 13.1–21.8) having played Instant Kiwi or some other scratch ticket in the last 12 months, even though it is illegal in New Zealand to purchase Instant Kiwi tickets at this age.

Table 7: Gambling participation by activity in the last 12 months, by age group, total population aged 15 years and over (unadjusted prevalence)

Gambling activity	Prevalence (%) for total adults (95% CI)						
	15–17 years	18–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65+ years
Any gambling activity	25.3 (20.6–30.1)	60.3 (56.8–63.8)	69.3 (66.8–71.8)	69.6 (67.5–71.7)	72.3 (70.0–74.6)	73.1 (70.7–75.6)	61.1 (58.5–63.6)
Lotto	5.7 (3.6–7.8)	34.9 (31.2–38.6)	57.8 (55.0–60.6)	63.6 (61.4–65.7)	66.8 (64.4–69.1)	66.6 (64.1–69.2)	54.0 (51.5–56.5)
Instant Kiwi	17.5 (13.1–21.8)	36.8 (33.3–40.4)	33.9 (31.1–36.6)	25.6 (23.3–27.9)	25.6 (23.0–28.1)	24.8 (22.5–27.2)	18.7 (16.9–20.6)
Non-casino gaming machines	1.6 (0.7–3.3)	17.4 (14.5–20.3)	13.4 (11.5–15.3)	9.8 (8.4–11.2)	9.2 (7.5–11.0)	9.4 (7.4–11.4)	7.2 (5.9–8.5)
Track betting	2.9 (1.4–5.3)	7.5 (5.2–9.7)	8.7 (7.0–10.4)	9.4 (7.8–11.0)	9.8 (8.4–11.2)	10.3 (8.4–12.1)	8.1 (6.6–9.6)
Casino gaming machines	0.9 (0.3–2.3)	10.2 (8.1–12.4)	10.8 (8.9–12.6)	8.2 (6.7–9.7)	7.1 (5.8–8.3)	7.6 (6.1–9.0)	5.7 (4.5–6.9)
Sports betting	0.9 (0.2–2.6)	5.9 (4.3–7.6)	7.2 (5.7–8.7)	5.8 (4.7–6.9)	6.5 (5.1–7.8)	4.6 (3.4–5.8)	2.7 (1.9–3.4)
Casino table games	0.3 (0.0–1.5)	3.8 (2.4–5.2)	3.4 (2.3–4.5)	2.5 (1.8–3.3)	2.2 (1.3–3.1)	1.0 (0.6–1.8)	0.7 (0.3–1.3)
Keno (not in a casino)	0.9 (0.3–2.3)	1.4 (0.6–2.6)	1.5 (1.0–2.0)	2.0 (1.4–2.6)	1.6 (0.9–2.2)	2.0 (1.4–2.7)	1.1 (0.6–1.5)
Housie	1.5 (0.6–2.9)	1.8 (0.9–3.1)	1.3 (0.8–1.8)	1.4 (0.9–1.8)	1.2 (0.7–1.7)	1.3 (0.8–1.9)	2.4 (1.7–3.1)
Internet gambling	*	0.7 (0.3–1.5)	0.7 (0.3–1.5)	0.5 (0.2–1.1)	0.4 (0.1–0.9)	0.2 (0.0–0.7)	0.1 (0.0–0.3)
Casino gaming tables or machines	0.9 (0.3–2.3)	11.6 (9.2–14.0)	12.7 (10.7–14.8)	9.3 (7.8–10.8)	8.5 (7.1–9.9)	8.0 (6.6–9.5)	6.1 (4.9–7.3)
Any type of gaming machine (casino or non-casino)	2.3 (1.1–4.1)	24.3 (21.3–27.3)	20.5 (18.2–22.8)	14.6 (12.8–16.4)	13.4 (11.5–15.2)	13.9 (11.8–16.1)	11.2 (9.6–12.8)

Source: 2006/07 New Zealand Health Survey

* Numbers were too low for reliable estimation for internet gambling among people aged 15–17 years.

By ethnic group

Table 8 presents an indication of the participation in gambling in New Zealand's main ethnic population groups. These results show very little difference in the overall unadjusted rates of past-year gambling between males and females in each ethnic group.

Table 8: Gambling in the last 12 months among adults, by ethnic group and gender (unadjusted prevalence)

Ethnic group	Gender	Prevalence (%) for total adults (95% CI)
European/Other	Males	68.0 (66.0–69.9)
	Females	67.3 (65.7–68.9)
	Total	67.6 (66.2–69.0)
Māori	Males	71.6 (68.7–74.5)
	Females	71.9 (69.6–74.3)
	Total	71.8 (69.8–73.7)
Pacific	Males	55.1 (49.4–60.7)
	Females	55.2 (50.5–60.0)
	Total	55.2 (51.2–59.1)
Asian	Males	44.9 (40.0–49.8)
	Females	43.3 (39.1–47.5)
	Total	44.0 (41.0–47.1)

Source: 2006/07 New Zealand Health Survey

Note: Total response ethnic group has been used. Ethnic groups cannot be compared using the unadjusted prevalence estimates presented in this table.

Adjusting for age, Māori and European/Other males and females were significantly more likely to have participated in gambling in the past 12 months, compared to males and females in the total population (Figure 10). By contrast, Pacific and Asian males and females were significantly less likely to have gambled in the last 12 months.

Figure 10: Gambling in the last 12 months, by ethnic group and gender (age-standardised rate ratio)
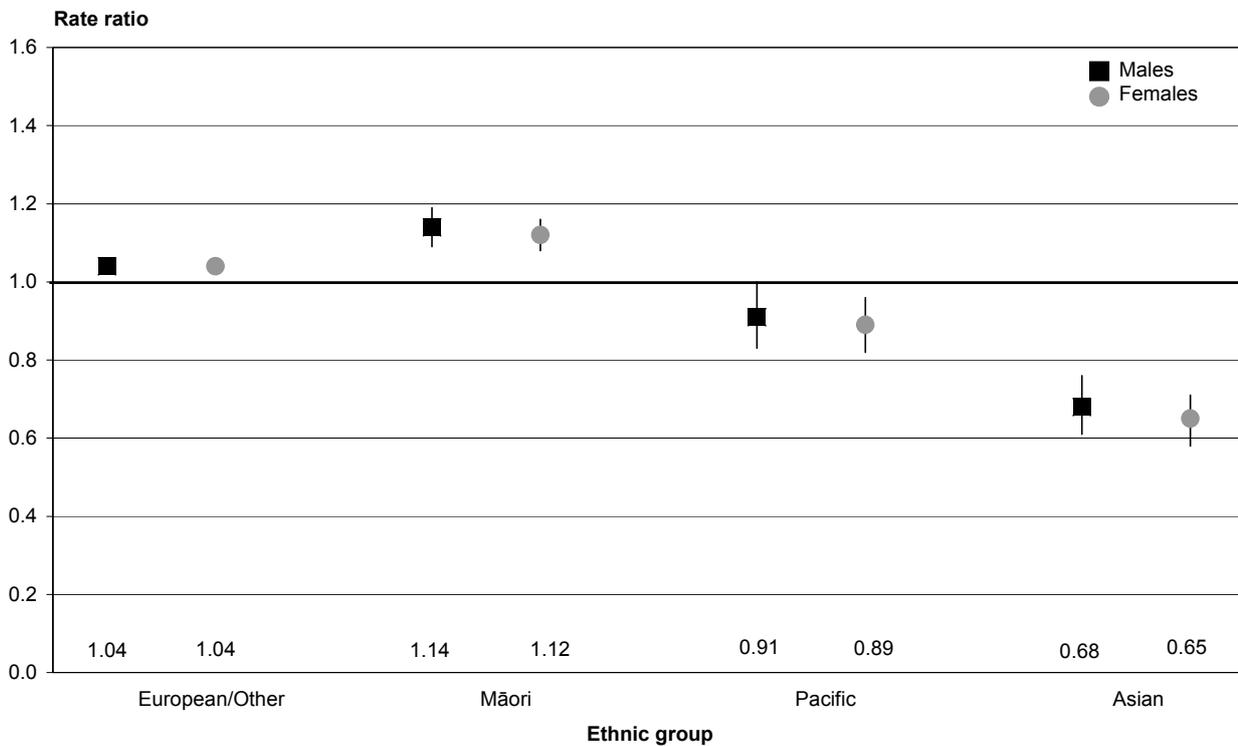
Source: 2006/07 New Zealand Health Survey

Notes: Age-standardised to WHO world population. Reference group, with a rate ratio of 1.0 (indicated by the bold line), is the total male or female population aged 15 years and over. Total response standard output for ethnic groups has been used.

Similarly, when looking at non-casino gaming machines, Māori and European/Other males and females were significantly more likely to have played on non-casino gaming machines in the last 12 months, compared to males and females in the total population, after adjusting for age (Figure 11).

Figure 11: Gambling on non-casino gaming machines in the last 12 months, by ethnic group and gender (age-standardised rate ratio)
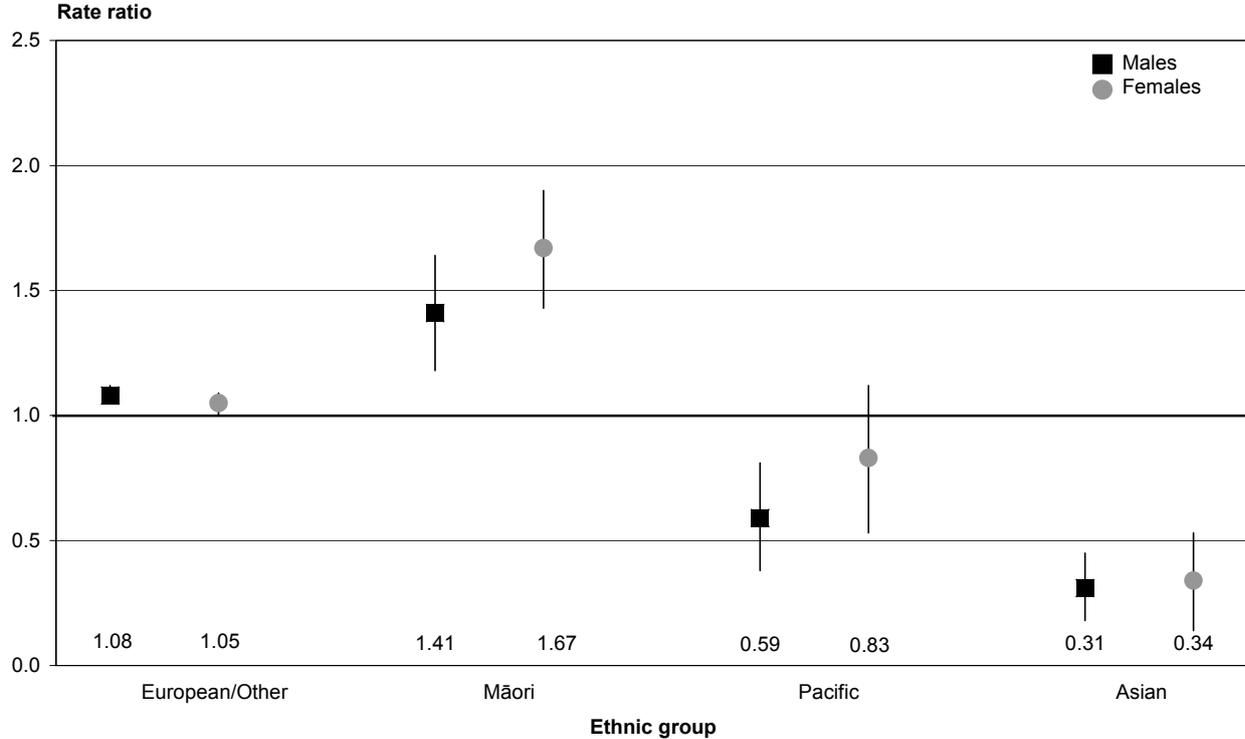
Source: 2006/07 New Zealand Health Survey

Notes: Age-standardised to WHO world population. Reference group, with a rate ratio of 1.0 (indicated by the bold line), is the total male or female population aged 15 years and over. Total response standard output for ethnic groups has been used.

There were some further significant differences in gambling participation between ethnic groups, after adjusting for age. For example, Māori and Pacific males and females were between two and four times more likely to have played Keno and housie in the last 12 months, compared to males and females in the total population. Compared to males and females in the total population, Asian males and females were significantly less likely to have gambled on the following activities in the last 12 months:

- Lotto
- Instant Kiwi
- non-casino gaming machines
- track betting
- sports betting
- housie (for males)
- internet gambling (for males).

There were no significant differences in past-year gambling on casino table games between Asian males and males in the total population, while Asian females were significantly less likely to have played these games than females in the total population.

By neighbourhood deprivation

There were no significant differences in past-year gambling between NZDep2006 quintile 1 (least deprived) areas and quintile 5 (most deprived) areas for males and females, after adjusting for age (Figure 12).

Figure 12: Gambling in the last 12 months, by NZDep2006 quintile and gender (age-standardised prevalence)
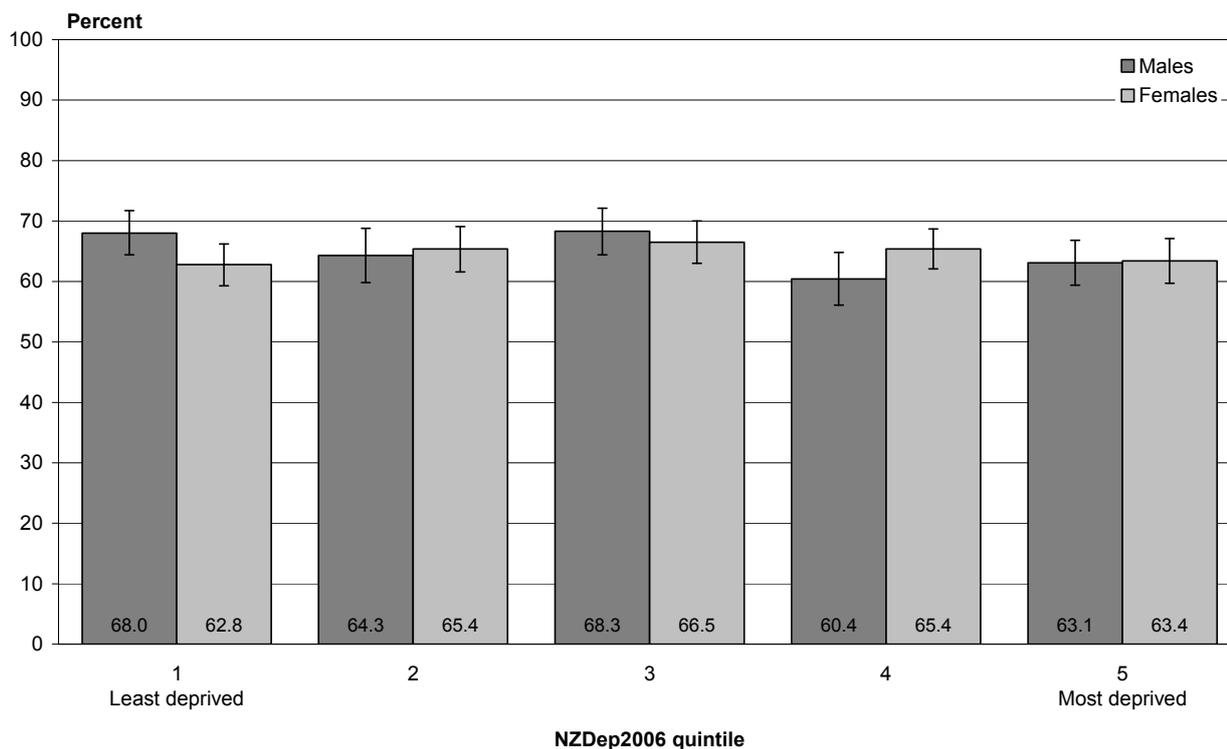
Source: 2006/07 New Zealand Health Survey

Males living in NZDep2006 quintile 1 (least deprived) were significantly more likely to have gambled on Lotto in the past year, compared to males living in quintile 5 (most deprived), when examining age-standardised prevalences (p-value < 0.05) (Figure 13).

Figure 13: Gambling on Lotto in the last 12 months, by NZDep2006 quintile and gender (age-standardised prevalence)
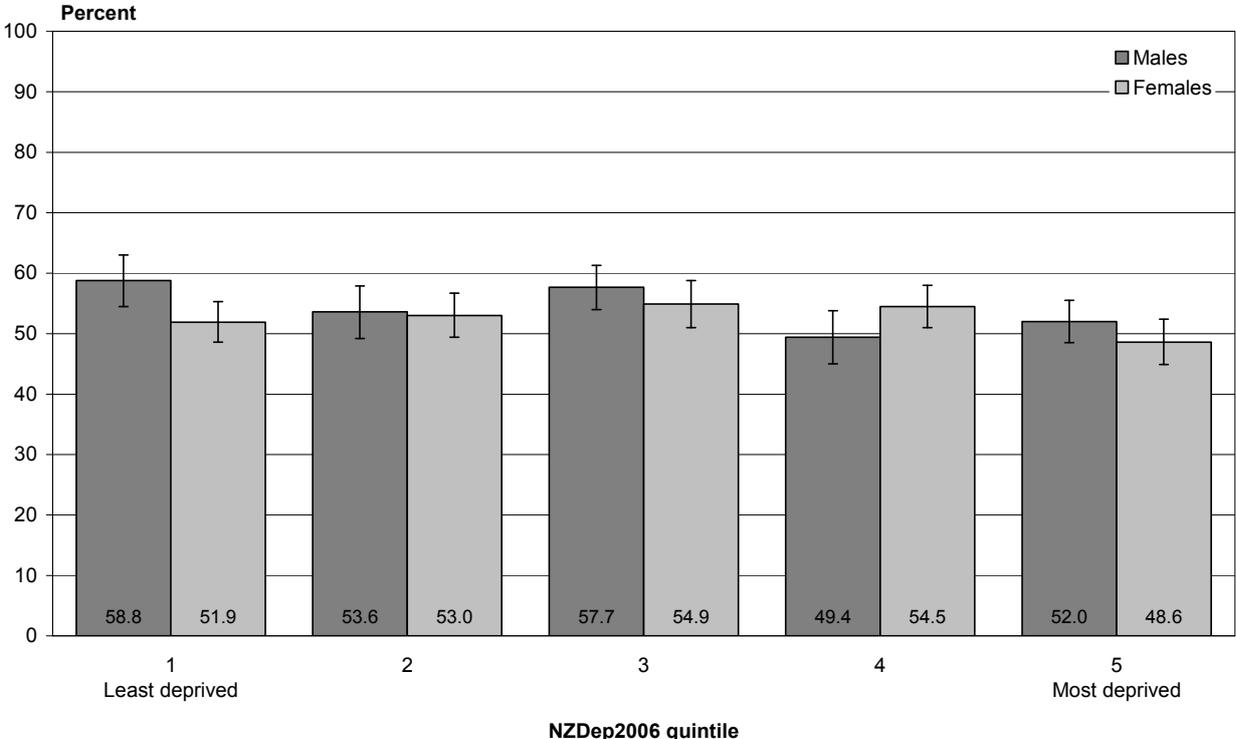
Source: 2006/07 New Zealand Health Survey

For non-casino gaming machines, males and females living in NZDep2006 quintile 5 (most deprived) areas were significantly more likely to have gambled on non-casino gaming machines in the previous 12 months than males and females living in quintile 1 (least deprived) areas (p-values < 0.05) (Figure 14).

Figure 1: Gambling on non-casino gaming machines in last 12 months, by NZDep2006 quintile and gender (age-standardised prevalence)
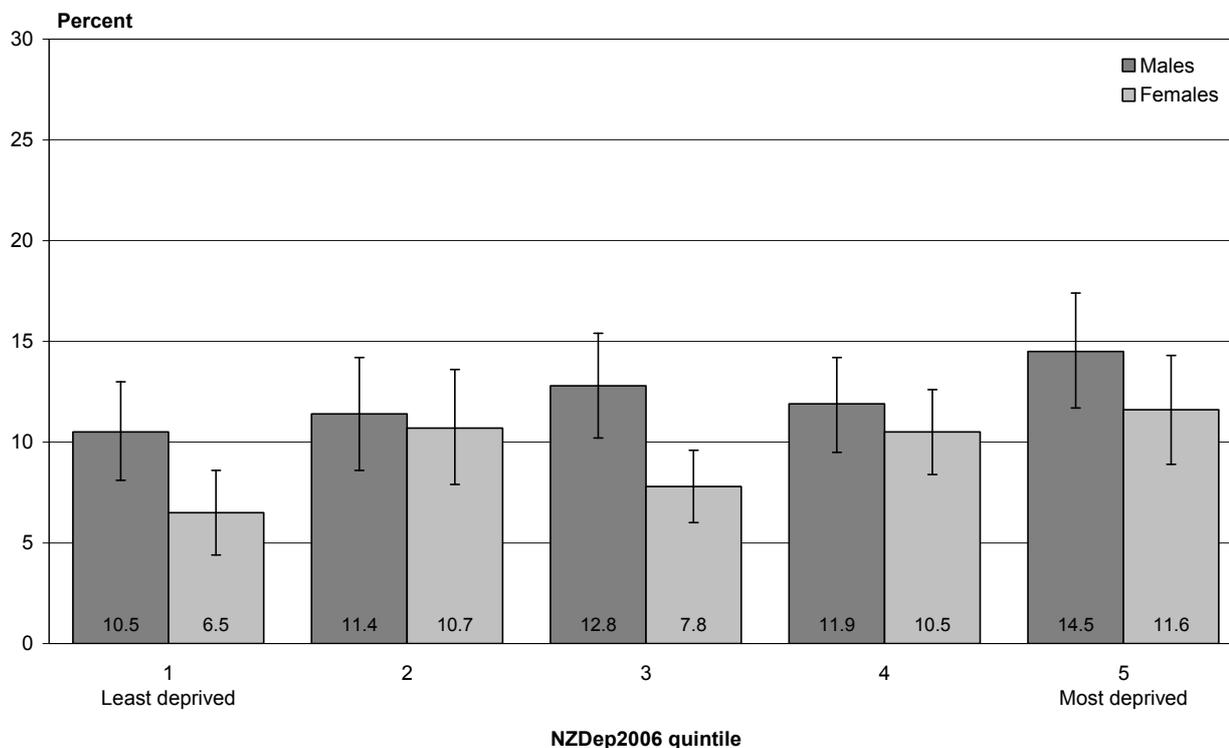
Source: 2006/07 New Zealand Health Survey

People living in NZDep2006 quintile 5 (most deprived) areas were also significantly more likely to have played Keno and housie in the last 12 months, compared to people living in quintile 1 (least deprived) areas, after adjusting for age. By comparison, people living in NZDep2006 quintile 1 (least deprived) areas were significantly more likely to have participated in sports betting in the past 12 months than people living in quintile 5 (most deprived) areas.

By urban/rural classification

Males and females living in secondary urban areas were significantly more likely to have gambled in the past year, compared to males and females living in main urban areas, after adjusting for age (Figure 15).

Figure 15: Gambling in the last 12 months, by urban/rural classification and gender (age-standardised prevalence)
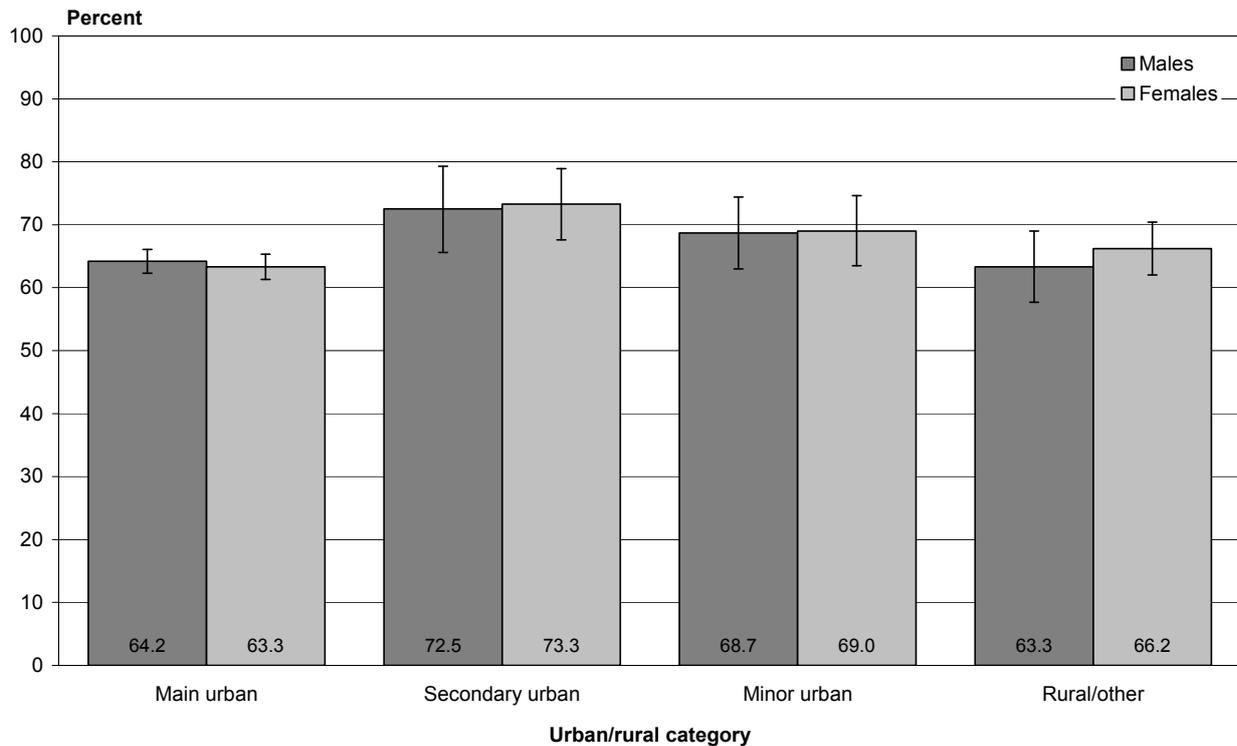
Source: 2006/07 New Zealand Health Survey

After adjusting for age, people living in secondary and minor urban areas were significantly more likely than other people to have participated in the following types of gambling in the last 12 months:

- Instant Kiwi
- non-casino gaming machines.

Changes in gambling participation since 2002/03

Both the 2002/03 and 2006/07 New Zealand Health Surveys asked respondents about gambling participation. Age-adjusted rates have been used to compare gambling participation rates from 2002/03 and 2006/07 to control for the different age structures of the populations at these points in time. However, the reader should interpret these comparisons with caution, due to the differences in the wording of the questions in the 2002/03 and 2006/07 New Zealand Health Surveys. This may have affected the responses given by respondents to this question. The wording of each of the questions is given below.

The 2002/03 New Zealand Health Survey asked all respondents aged 15 years and over the following question about gambling participation:

Which games, if any, have you played over the last 12 months? Any others?

- *Lotto*
- *Instant Kiwi*
- *Daily Keno*
- *casino (the main ones)*
- *gaming machine – pokies <u>not </u>in casinos*
- *TAB horses / dogs*
- *overseas horse and dog races*
- *track horse and dog races*
- *TAB sports*
- *overseas sports betting*
- *housie*
- *0900 gambling games*
- *internet gaming*
- *none of these.*

The 2006/07 New Zealand Health Survey asked respondents aged 15 years and over the following question about gambling participation:

Looking at Card X, 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 (excluding office sweepstakes)*
- *sports betting at the TAB or with an overseas betting organisation*
- *gaming machines or pokies at one of the six casinos*
- *table games or any other games at one of the six casinos*
- *gaming machines or pokies in a pub or club (not in a casino)*
- *internet-based gambling*
- *other gambling activity (specify)*
- *none of the above.*

For both of the above questions multiple responses were allowed.

Overall, the 2002/03 New Zealand Health Survey showed that almost seven in ten adults aged 15 years and over (69.4%, 68.2–70.6) had gambled in the last 12 months, compared to the 2006/07 New Zealand Health Survey, which found that 65.3% (64.2–66.5) of adults aged 15 years and over had gambled in the past 12 months.

Using age-adjusted rates to compare participation rates, Figure 16 shows there has been a significant decrease in participation in any gambling activity in New Zealand

between the 2002/03 and 2006/07 surveys. In addition, there have been significant decreases in past-year participation rates from 2002/03 to 2006/07 in the following gambling activities:

- Lotto
- Instant Kiwi
- non-casino gaming machines
- track betting
- Keno.

There was a significant increase in participation in sports betting from 2002/03 to 2006/07, after adjusting for age (p-value < 0.05).

Figure 16:   Comparison of participation in gambling activities, among total population aged 15 years and over, 2002/03 and 2006/07 (age-standardised prevalence)
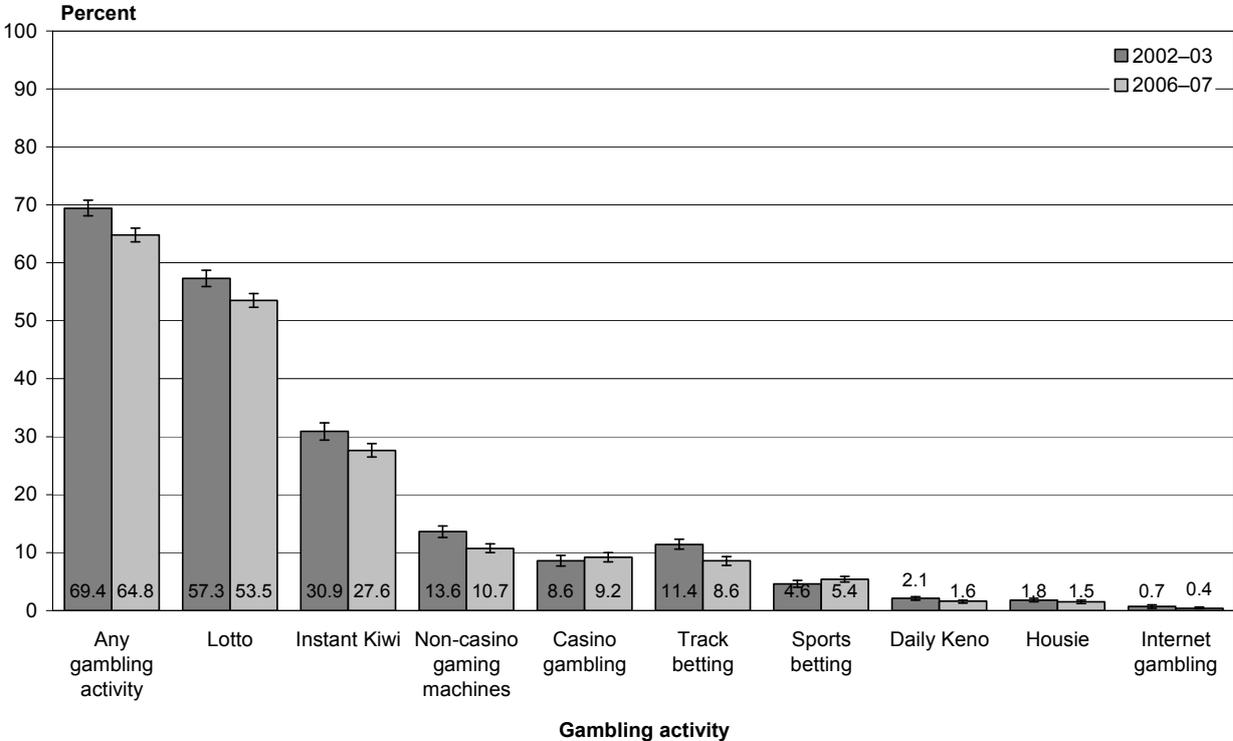
Sources: 2002/03 and 2006/07 New Zealand Health Surveys

Gambling participation rates dropped significantly for both males and females from 2002/03 to 2006/07, although Department of Internal Affairs statistics indicate that expenditure on gambling increased over this period. Although there appear to have been decreases in overall past-year gambling participation among Māori males and females, these were not statistically significant.

When looking only at the population aged 18 and over and/or 20 years and over, there was a similar significant decrease in past-year gambling participation. Additional tables showing these analyses have been provided in the appendix.

Chapter 4: Problem Gambling

Key findings

Prevalence of problem gambling

- In 2006/07 the prevalence of problem gambling in New Zealanders aged 15 years and over was 0.4% (95% confidence interval 0.3–0.5), as defined by the Canadian Problem Gambling Index (CPGI). This represents approximately 13,100 people aged 15 years and over.

- In addition, a further 1.3% (1.1–1.5) of adults were moderate-risk gamblers. This represents a further 40,900 people.

- Overall, 1.7% (1.5–2.0) of the adult population were problem or moderate-risk gamblers, representing 1 in 58 adults in the population, or an estimated 54,000 people.

Profile of people experiencing gambling problems

- The prevalence of problem gambling was highest among 35–44-year-olds (1.2%, 0.6–1.7).

- After adjusting for differences in age, Māori and Pacific males and females were approximately four times more likely to be problem gamblers, compared to males and females in the total population.

- Although Pacific males and females had significantly lower participation in gambling compared to the total male and female populations, they were significantly more likely to be problem gamblers.

- People living in more socioeconomically deprived areas (NZDep2006 quintile 5) were significantly more likely to be problem gamblers than other people, after adjusting for age. Half of problem gamblers (50.0%, 35.0–64.9) lived in quintile 5 (most deprived) areas, compared to approximately 20% of the total population.

- Socio-demographic factors that were found to be significantly associated with problem gambling in regression analysis included:
  – being aged 35–44 years
  – being of Māori or Pacific ethnicity
  – having fewer educational qualifications
  – living in more socioeconomically deprived areas (NZDep2006 quintiles 4 and 5).

  The risk factors of gender, work status, household size, employment status and urban/rural status were not statistically significant in the analysis.

- Although only 1 in 20 recreational gamblers had gambled on four or more activities in the last year (5.3%, 4.6–6.0), three in five problem gamblers had done so (60.0%, 47.8–72.2).

- Four in every five problem gamblers (81.7%, 72.3–91.1) had played on non-casino gaming machines in the past year, compared to 12.6% (11.6–13.7) of recreational gamblers.

Introduction

In the 2006/07 New Zealand Health Survey problem gambling was measured with the nine-question section of the Canadian Problem Gambling Index (CPGI), also known as the Problem Gambling Severity Index (PGSI) (Ferris and Wynne 2001). The CPGI consists of nine questions about problems that people may be experiencing due to their gambling. The responses are scored to a maximum of 27 points.

One of the advantages of the nine-question CPGI is that it measures the range of gambling problems, from no problems through to severe problems. Using the CPGI people can be grouped according to the following types of gambling:

- non-gambling (not gambled in the past 12 months)
- recreational (non-problematic) gambling
- low-risk gambling
- moderate-risk gambling
- problem gambling.

This is the first time the nine-question CPGI screen has been used in a population-based survey in New Zealand. It is important to note that the prevalence of problem gambling from this study is not directly comparable with estimates of problem gambling from previous New Zealand national surveys due to the use of different gambling screens.

Prevalence of problem gambling

Using the CPGI, 0.4% (95% confidence interval 0.3–0.5) of New Zealanders aged 15 years and over were found to be problem gamblers. This equates to about 13,100 people experiencing serious gambling problems (Table 9). In addition, a further 1.3% (1.1–1.5) of adults were moderate-risk gamblers, representing approximately a further 40,900 people. Moderate-risk gamblers were those people who may or may not have been experiencing harms already, but who were particularly at risk of developing problems in the future.

In total, 1 in 58 adults (1.7%, 1.5–2.0) were either problem gamblers or moderate-risk gamblers. This represented about 54,000 people in New Zealand who were gambling at levels that were likely to be leading to negative consequences. In addition, 1 in 30 people (3.5%, 3.1–3.9) were low-risk gamblers, indicating that they were probably gambling at levels that were not currently leading to negative consequences, but are potentially at risk in the future.

Table 9: Prevalence of problem gambling in New Zealand adults aged 15 years and over, according to Canadian Problem Gambling Index (unadjusted prevalence)

Problem gambling level	Prevalence (%) for total adults (95% CI)	Prevalence (%) for past-year gamblers (95% CI)	Estimated number of adults (95% CI)
Non-gambling	34.7 (33.5–35.8)	–	1,082,300 (1,045,400–1,117,200)
Recreational gambling	60.1 (58.9–61.3)	92.0 (91.4–92.7)	1,875,400 (1,838,100–1,913,000)
Low-risk gambling	3.5 (3.1–3.9)	5.3 (4.8–5.9)	109,000 (96,700–121,700)
Moderate-risk gambling	1.3 (1.1–1.5)	2.0 (1.7–2.3)	40,900 (34,300–46,800)
Problem gambling	0.4 (0.3–0.5)	0.6 (0.5–0.8)	13,100 (9,400–15,600)
Combined problem and moderate-risk gambling	1.7 (1.5–2.0)	2.7 (2.3–3.0)	54,000 (46,800–62,400)

Source: 2006/07 New Zealand Health Survey

Among past-year gamblers aged 15 years and over, the prevalence of problem gambling was 0.6% (0.5–0.8), and the prevalence of moderate-risk gambling was 2.0% (1.7–2.3) (Table 9). Overall, this indicates that 1 in 40 past-year gamblers (2.7%, 2.3–3.0) were either problem or moderate-risk gamblers.

When looking only at the total adult population aged 18 years and over, the prevalence estimate for problem gambling was 0.4% (0.3–0.6), while the prevalence estimates for moderate-risk and low-risk gambling were 1.4% (1.2–1.6) and 3.6% (3.2–4.0) respectively.

Profile of people experiencing gambling problems

Introduction

This section examines the profile of people experiencing gambling problems in New Zealand. It provides important information for investigating differences in gambling-related harm experienced by population groups, and for exploring inequalities in gambling-related harm. The section focuses on both problem gambling and moderate-risk gambling, as these two levels of gambling may both be leading to negative consequences for the individual, and therefore both gambling levels are of interest.

Results are presented by gender, age group, ethnic group, area-level socioeconomic deprivation and urban/rural classification. Comparisons for some population groups have been carried out using age-standardised rates, to control for the different age structures of the population groups. All rates (unadjusted and age standardised) are available on the web tables www.moh.govt.nz.

By gender

There were no significant differences by gender in the age-standardised prevalence of problem gambling (Figure 17). However, males were significantly more likely to be moderate-risk gamblers (2.0%, 1.5–2.4) than females (0.8%, 0.6–1.0), after adjusting for age. Overall, for combined problem and moderate-risk gambling, males had a significantly higher prevalence (2.5%, 2.0–3.0) than females (1.2%, 0.9–1.4), after adjusting for age.

Figure 17:   Problem gambling by CPGI level, among adults, by gender (age-standardised prevalence)
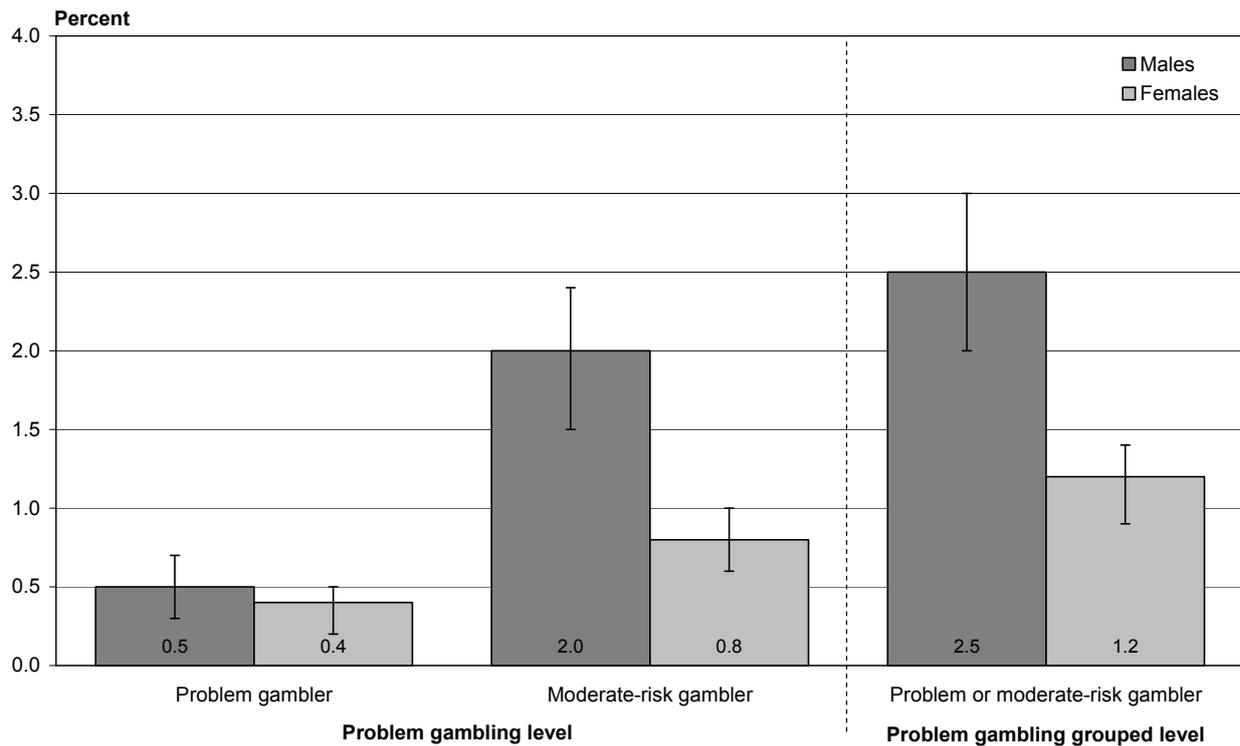
Source: 2006/07 New Zealand Health Survey

There were similar results when looking only at past-year gamblers. There were no significant differences in the prevalence of problem gambling between males and females, but males had significantly higher age-standardised prevalences than females, for both moderate-risk gambling and combined problem and moderate-risk gambling.

By age group

People aged 35–44 years were at least three times more likely than any other age group to be problem gamblers, with a prevalence of 1.2% (0.6–1.7) (Figure 18). The prevalence of problem gambling appears to be similar for people in the age groups 15–24 years, 25–34 years and 45–54 years, with a decrease in the rate of problem gambling in people aged 55 years and over.

Figure 18: Problem gambling among adults, by age group (unadjusted prevalence)
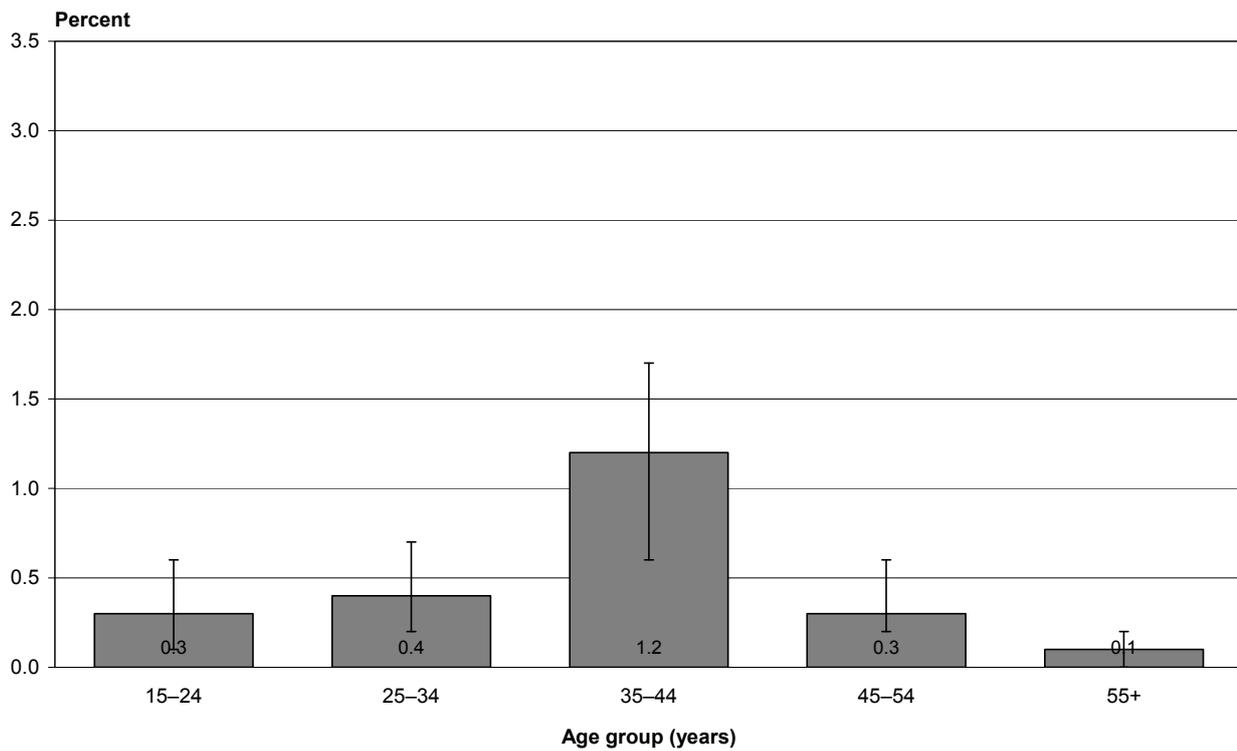
Source: 2006/07 New Zealand Health Survey

When looking at combined problem and moderate-risk gamblers, males had significantly higher rates than females in all age groups from 18 to 54 years (p-values < 0.05) (Figure 19).

Figure 19: Problem and moderate-risk gambling among adults, by age group and gender (unadjusted prevalence)
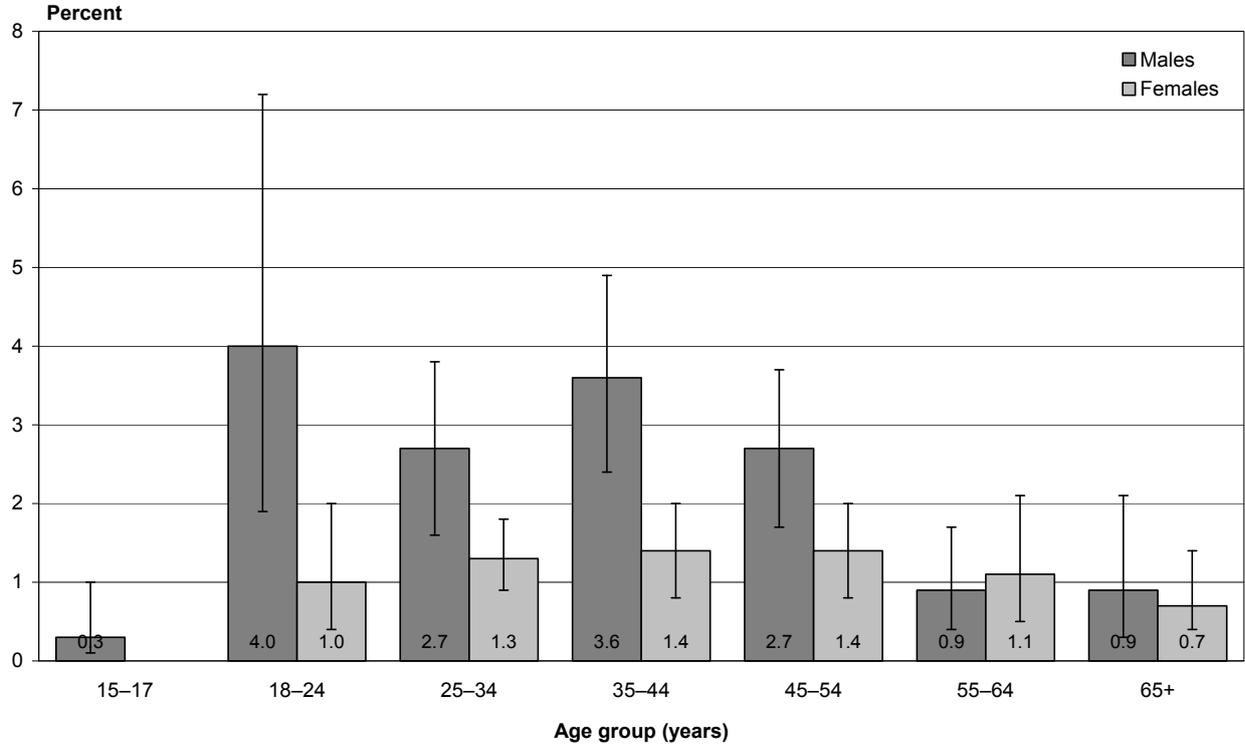
Source: 2006/07 New Zealand Health Survey

* Numbers were too low for reliable estimation for females aged 15–17 years.

By ethnic group

Table 10 presents an indication of the burden of problem gambling in New Zealand's main ethnic population groups. These results show that, overall, approximately 1 in 16 Māori and Pacific males and 1 in 24 Māori and Pacific females were either problem or moderate-risk gamblers.

Table 10: Problem gambling, by ethnic group and gender (unadjusted prevalence)

Ethnic group	Gender	Prevalence (%) for total adults (95% CI)			Estimated number of adults (95% CI)		
		Problem gambling	Moderate-risk gambling	Combined problem and moderate-risk gambling	Problem gambling	Moderate-risk gambling	Combined problem and moderate-risk gambling
European/ Other	Males	0.3 (0.1–0.5)	1.4 (0.9–1.9)	1.7 (1.2–2.2)	3,200 (1,200–6,100)	17,300 (11,000–23,300)	20,400 (14,700–27,000)
	Females	0.2 (0.1–0.4)	0.5 (0.3–0.7)	0.7 (0.4–0.9)	2,400 (1,300–5,300)	6,400 (4,000–9,300)	8,900 (5,300–11,900)
	Total	0.2 (0.1–0.4)	0.9 (0.7–1.2)	1.1 (0.9–1.4)	5,600 (2,600–10,200)	23,700 (17,900–30,600)	29,300 (23,000–35,700)
Māori	Males	2.0 (1.1–3.2)	4.2 (3.0–5.5)	6.2 (4.7–7.7)	3,300 (1,800–5,300)	6,900 (4,900–9,100)	10,200 (7,700–12,700)
	Females	1.5 (0.8–2.1)	2.8 (2.1–3.6)	4.3 (3.3–5.3)	2,800 (1,500–4,000)	5,400 (4,000–6,900)	8,200 (6,300–10,100)
	Total	1.7 (1.2–2.2)	3.5 (2.7–4.2)	5.2 (4.3–6.1)	6,000 (4,300–7,800)	12,400 (9,600–14,900)	18,400 (15,300–21,700)
Pacific	Males	1.8 (0.6–3.8)	4.9 (2.8–7.7)	6.6 (4.5–9.3)	1,400 (500–3,000)	3,800 (2,200–6,000)	5,200 (3,500–7,300)
	Females	1.6 (0.6–3.5)	2.6 (1.2–4.7)	4.1 (2.4–6.6)	1,400 (500–3,000)	2,200 (1,000–4,100)	3,600 (2,100–5,700)
	Total	1.7 (0.7–3.3)	3.7 (2.2–5.1)	5.3 (3.6–7.1)	2,800 (1,200–5,400)	6,000 (3,600–8,400)	8,800 (5,900–11,700)
Asian	Males	0.1 (0.0–0.5)	2.2 (1.1–4.0)	2.3 (1.2–4.1)	100 (0–700)	2,900 (1,400–5,200)	3,000 (1,600–5,300)
	Females	0.0 (0.0–0.3)	0.6 (0.2–1.5)	0.7 (0.2–1.5)	100 (0–400)	900 (300–2,200)	1,000 (300–2,200)
	Total	0.1 (0.0–0.3)	1.4 (0.8–2.2)	1.4 (0.8–2.3)	200 (0–800)	3,800 (2,200–6,100)	4,000 (2,200–6,400)

Source: 2006/07 New Zealand Health Survey

Notes: Total response ethnic group has been used. Ethnic groups cannot be compared using the unadjusted prevalence estimates presented in this table. Population estimates refer to the usually resident population in permanent private dwellings aged 15 years and over, in 2006/07.

After adjusting for age, Māori and Pacific males and females were approximately four times more likely to be problem gamblers, compared to males and females in the total population (Figure 20). However, although Māori had significantly higher gambling participation rates than the total population, Pacific people had significantly lower participation rates. European/Other and Asian males and females were significantly less likely to be problem gamblers.

Figure 20: Problem gambling, by ethnic group and gender, compared to the total population (age-standardised rate ratio)
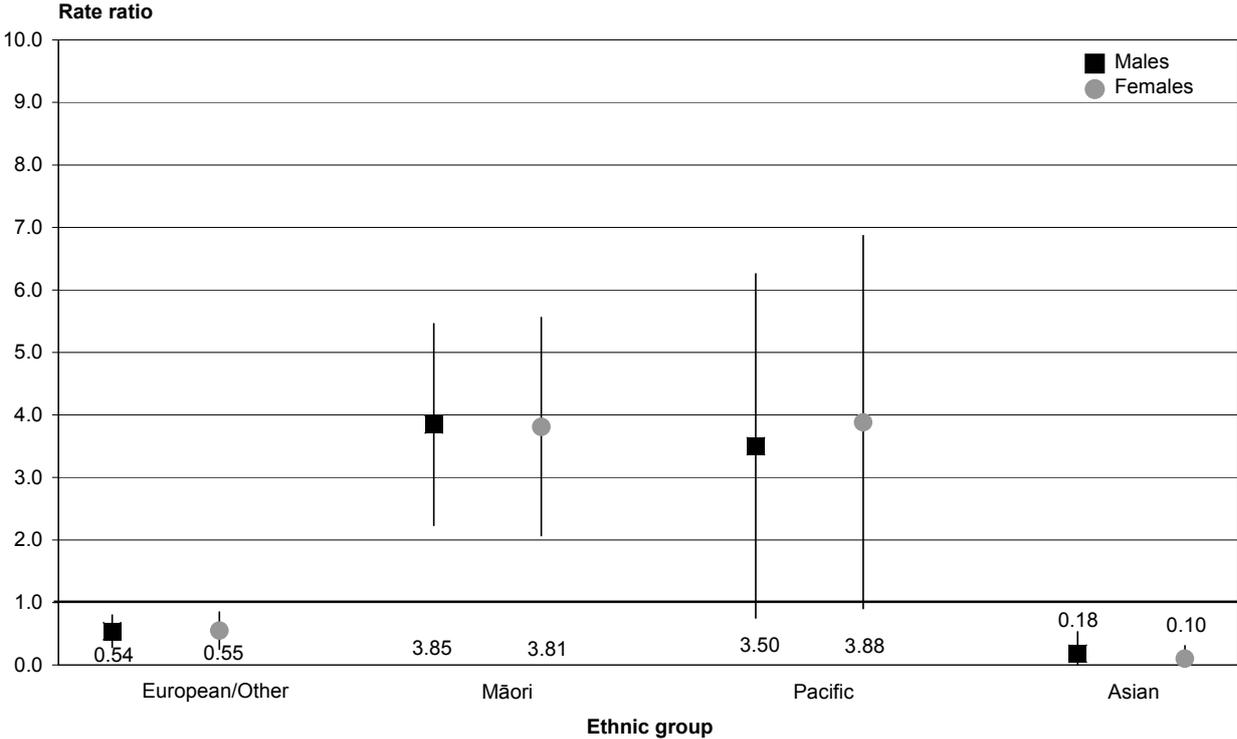
Source: 2006/07 New Zealand Health Survey

Notes: Age-standardised to WHO world population. Reference group, with a rate ratio of 1.0 (indicated by the bold line), is the total male or female population aged 15 years and over. Total response standard output for ethnic groups has been used.

When examining combined problem and moderate-risk gambling, Māori and Pacific females were over 3.5 times more likely to be problem or moderate-risk gamblers, compared to females in the total population, after adjusting for age (Figure 21). Additionally, Māori and Pacific males were significantly more likely to be problem or moderate-risk gamblers, compared to males in the total population.

European/Other and Asian females were significantly less likely to be problem or moderate risk gamblers, compared to females in the total population. There were no significant differences in the prevalence of problem and moderate-risk gambling between Asian males and males in the total population, after adjusting for age.

Figure 21: Combined problem and moderate-risk gambling, by ethnic group and gender (age-standardised rate ratio)
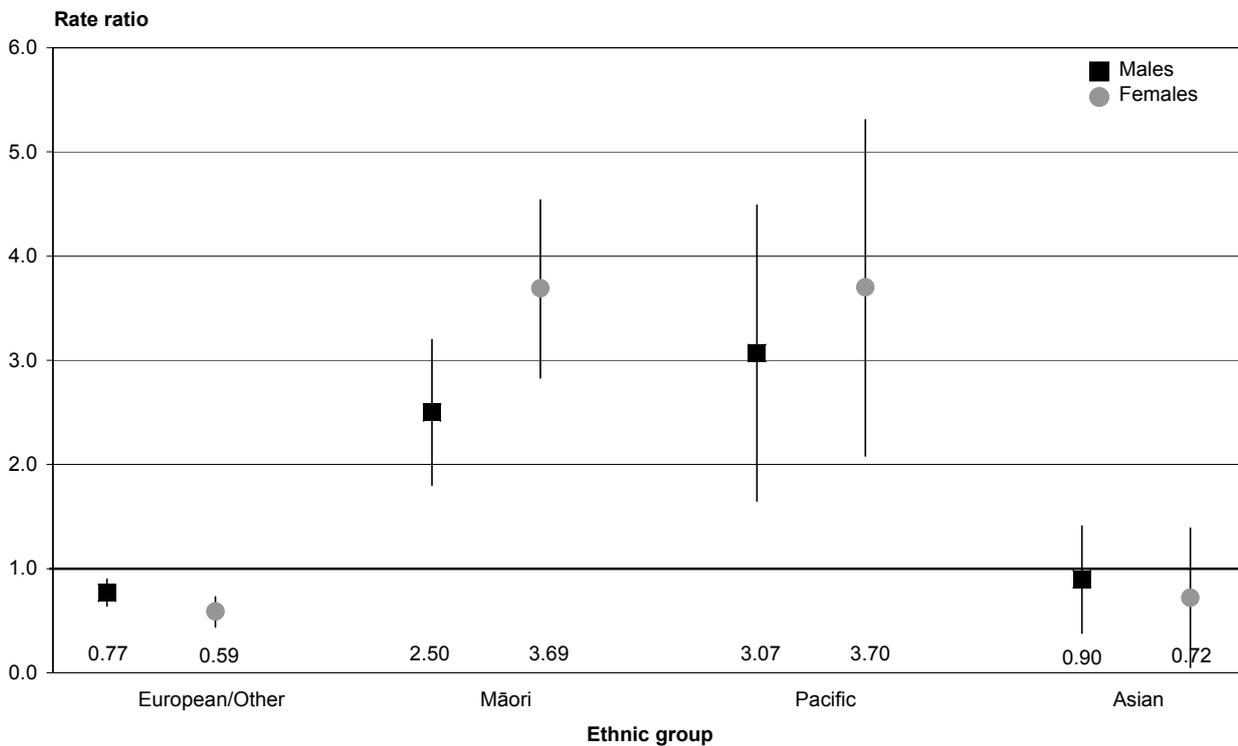
Source: 2006/07 New Zealand Health Survey

Notes: Age-standardised to WHO world population. Reference group, with a rate ratio of 1.0 (indicated by the bold line), is the total male or female population aged 15 years and over. Total response standard output for ethnic groups has been used.

By neighbourhood deprivation

Adjusting for age, there was a significant increase in problem gambling with increasing neighbourhood deprivation, according to NZDep2006 deprivation quintiles. People living in NZDep2006 quintile 5 (most deprived) areas were significantly more likely to be a problem gambler (1.2%, 0.8–1.7) than people living in any other deprivation quintiles.

There were similar findings when examining combined problem and moderate-risk gambling. Figure 22 shows that males and females living in NZDep2006 quintile 5 (most deprived) areas were significantly more likely to be problem or moderate-risk gamblers compared to males and females in all other NZDep2006 quintiles. Males living in NZDep2006 quintile 5 (most deprived) were over three times as likely to be problem or moderate-risk gamblers than males living in NZDep2006 quintile 1 (least deprived), after adjusting for age. Females living in NZDep2006 quintile 5 (most deprived) were significantly more likely than females living in any other NZDep2006 quintile to be a problem or moderate-risk gambler (p-values < 0.05).

Figure 22: Problem and moderate-risk gambling, by NZDep2006 quintile and gender (age-standardised prevalence)
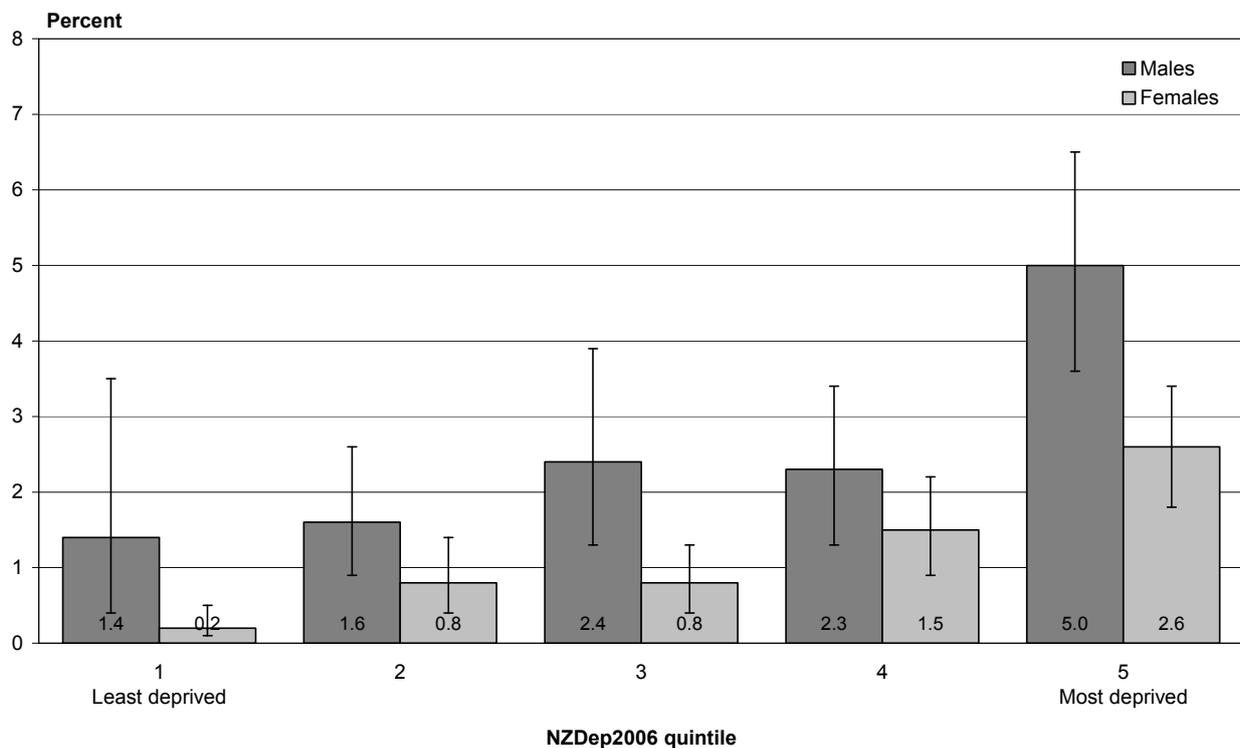
Source: 2006/07 New Zealand Health Survey

By urban/rural classification

When examining combined problem and moderate-risk gamblers, there was a significantly lower prevalence in males living in rural areas compared to males in main urban areas, after adjusting for age (p-value < 0.05) (Figure 23). For females, there were no significant differences in the prevalence of problem and moderate-risk gambling by urban area.

Figure 23: Problem and moderate-risk gambling, by urban classification and gender (age-standardised prevalence)
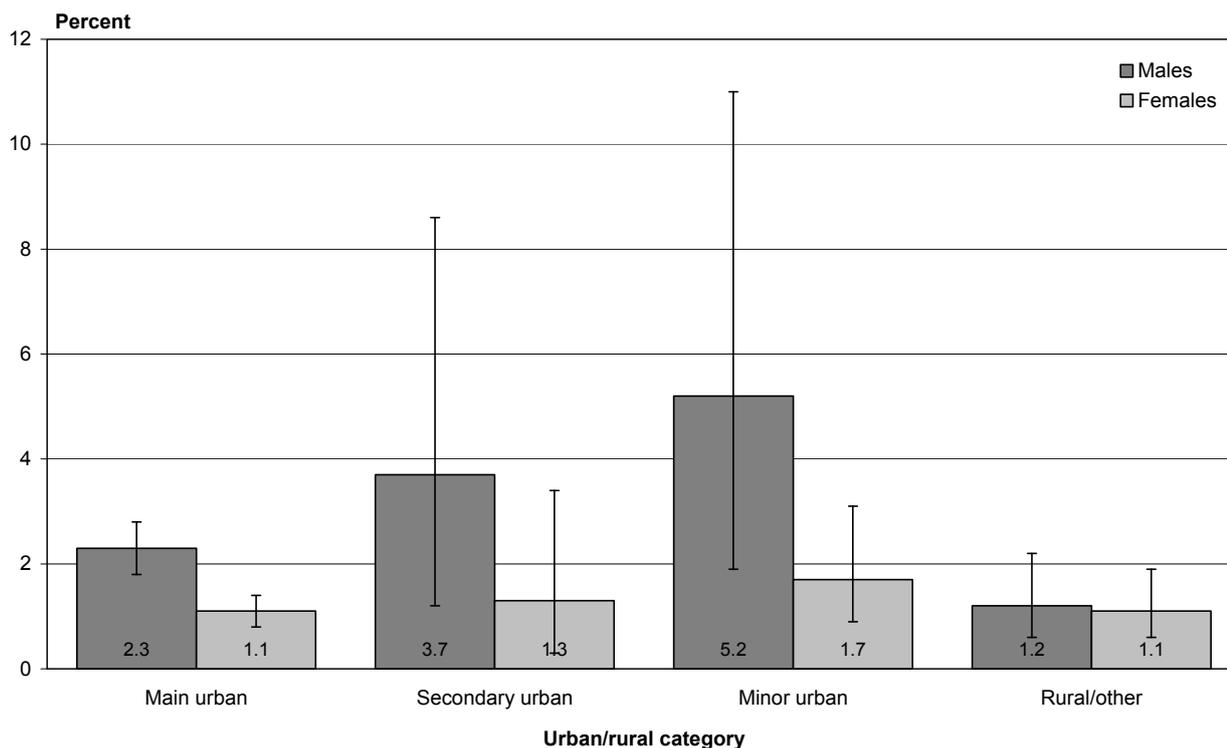
Source: 2006/07 New Zealand Health Survey

Characteristics of problem and moderate-risk gamblers

This section presents the characteristics of problem gamblers (as measured by the CPGI), compared to the characteristics of the total adult (15 years and over) population in the 2006 Census.

Table 11 shows that people aged 35–44 years were over-represented among problem gamblers, as were people of Māori and Pacific ethnicity and people living in NZDep2006 quintile 5 (most deprived) areas. Half of all problem gamblers (50.0%, 35.0–64.9) lived in NZDep2006 quintile 5 areas, which are the 20% most socioeconomically deprived areas in New Zealand according to the New Zealand Index of Deprivation, while an additional 28.4% (15.1–45.2) of problem gamblers lived in NZDep2006 quintile 4.

Table 11: Characteristics of people with gambling problems, by CPGI gambling type (unadjusted prevalence)

| Variable | Levels | Prevalence (%) for total adults (95% CI) | | | Adult population (aged 15 years and over) (2006 Census) (%) |
		Problem gambling (%)	Moderate-risk gambling (%)	Combined problem gambling and moderate-risk gambling (%)	
Gender	Males	55.9 (41.6–70.3)	68.4 (60.6–76.1)	65.4 (59.2–71.6)	48.0
	Females	44.1 (29.7–58.4)	31.6 (23.9–39.4)	34.6 (28.4–40.8)	52.0
Age group	15–24 years	11.4 (4.2–23.3)	19.7 (10.9–31.4)	17.7 (9.4–25.9)	17.7
	25–34 years	15.2 (7.4–26.4)	19.7 (12.7–26.7)	18.6 (12.8–24.4)	16.3
	35–44 years	55.1 (39.8–70.4)	19.2 (12.6–25.7)	27.9 (21.4–34.4)	19.5
	45–54 years	13.8 (6.5–24.5)	23.1 (16.2–30.0)	20.9 (15.4–26.3)	17.8
	55–64 years	4.0 (0.7–12.3)	9.0 (4.9–14.9)	7.8 (4.4–12.6)	13.4
	65+ years	0.6 (0.0–3.3)	9.3 (4.4–16.7)	7.2 (3.5–12.9)	15.3
Ethnic group (total response)*	European/Other	42.9 (26.7–60.2)	57.9 (49.6–66.2)	54.3 (47.0–61.5)	81.8
	Māori	46.1 (31.9–60.3)	30.2 (23.4–37.0)	34.0 (27.3–40.8)	11.4
	Pacific	21.1 (9.0–38.4)	14.7 (9.0–20.4)	16.2 (11.3–21.2)	5.3
	Asian	1.5 (0.1–5.8)	9.3 (5.2–15.1)	7.4 (4.4–11.7)	8.9
NZDep2006 quintile	Quintile 1 (least deprived)	1.1 (0.0–5.9)	10.6 (3.9–21.9)	8.3 (3.2–16.9)	21.6
	Quintile 2	7.0 (2.2–16.2)	15.0 (8.6–21.3)	13.0 (7.7–18.4)	19.5
	Quintile 3	13.5 (5.0–27.5)	19.5 (11.3–27.8)	18.1 (11.7–24.4)	20.7
	Quintile 4	28.4 (15.1–45.2)	20.2 (12.8–27.7)	22.2 (15.4–29.0)	20.5
	Quintile 5 (most deprived)	50.0 (35.0–64.9)	34.6 (26.2–43.1)	38.4 (31.5–45.2)	17.7

Source: 2006/07 New Zealand Health Survey. Adult population is the usually resident population according to the 2006 Census.

* Total response ethnicity has been used, and thus each ethnic group includes all people who reported that ethnic group. For this reason, percentages may not sum to 100%.

For combined problem and moderate-risk gambling, males were also over-represented, with two in three problem and moderate-risk gamblers being male. People aged 35–44 years were also over-represented, with one in four problem and moderate-risk gamblers (27.9%, 21.4–34.4) falling within this age group.

Risk factors for problem gambling

Introduction

This section presents an analysis of the socio-demographic factors associated with problem gambling. Logistic regression was used to determine the association of selected demographic and socioeconomic variables with problem gambling behaviour, while adjusting for all other factors. In the full logistic regression model interaction effects were tested, and backward model selection using the Wald test was used to fit the final model.

The variables included in the regression analysis were chosen on the basis of the background literature review of the most likely factors associated with problem gambling and based on analysis conducted in previous New Zealand problem gambling studies. Many variables could affect the problem gambling status of an adult, and it was not possible within the scope of this survey to examine all of these possibilities and combinations. The initial analysis included the following variables: gender, age group, prioritised ethnic group, household size, education, work status, area deprivation and urban/rural classification.

Prioritised ethnic groups were used rather than total response ethnic groups because fitting a model with total response ethnic groups is difficult when modelling (particularly with small numbers) due to the limitations relating to fitting the main effects terms and interaction terms.

Key results

The key risk factors for problem gambling are presented in Table 12.

Significant risk factors for problem gambling included:

- age: people aged 35–44 years were at greater risk
- ethnicity: people of Māori or Pacific ethnicity were at greater risk
- education: people with lower educational attainment were at greater risk
- area deprivation: people living in the 40% more deprived areas (NZDep2006 quintiles 4 and 5) were at greater risk.

The regression analysis found that gender, household size, work status and urban/rural classification were not significantly associated with problem gambling, after taking other factors into account. The analysis suggested that the total risk among Māori and Pacific peoples was not fully explained by the other variables included in this analysis.

Table 12: Socio-demographic risk factors for problem gambling (odds ratios and 95% confidence intervals)

Variable	Levels	Odds ratio (95% CI)	p-value
Gender	Male	1.46 (0.75–2.85)	0.265
	Female	1	–
Age group	15–24 years	1	–
	25–34 years	2.03 (0.62–6.60)	0.236
	35–44 years	7.12 (2.28–22.23)	< 0.001
	45–54 years	1.93 (0.49–7.60)	0.341
	55+ years	0.36 (0.04–2.96)	0.337
Ethnic group (prioritised)	European/Asian/Other	1	–
	Māori	5.18 (2.43–11.04)	< 0.001
	Pacific	5.17 (2.00–13.34)	< 0.001
Household size	1 person	1	–
	2 people	0.62 (0.30–1.28)	0.193
	3 people	0.36 (0.12–1.08)	0.067
	4 people	0.51 (0.17–1.49)	0.214
	5 people	0.46 (0.18–1.19)	0.109
Educational status	No secondary school qualifications	3.10 (1.17–8.20)	0.023
	Secondary school qualifications	2.45 (1.04–5.80)	0.041
	Post-secondary school qualifications	1	–
Employment status	Working	1	–
	Unemployed	1.42 (0.54–3.78)	0.475
	Not in labour force	0.92 (0.45–1.88)	0.812
NZDep2006 quintile	Quintile 1 and 2 (least deprived)	1	–
	Quintile 3	2.66 (0.68–10.37)	0.157
	Quintile 4	4.55 (1.58–13.10)	0.005
	Quintile 5 (most deprived)	5.28 (1.85–15.05)	0.002
Urban/rural	Main urban	1	–
	Secondary urban	1.09 (0.10–12.18)	0.941
	Minor urban	1.14 (0.34–3.86)	0.830
	Rural/other	0.72 (0.25–2.13)	0.551

Source: 2006/07 New Zealand Health Survey

Note: For each variable, the reference category has an odds ratio of 1.

Gambling behaviours and problem gambling

Number of gambling activities participated in during last 12 months

The number of gambling activities participated in during the last 12 months was examined by problem gambling level. Figure 24 shows that the prevalence of gambling on four or more activities in the last year increased with problem gambling severity. While only 1 in 20 recreational gamblers had gambled on four or more activities in the last year (5.3%, 4.6–6.0), three in five problem gamblers had done so (60.0%, 47.8–72.2).

Figure 24: Number of gambling activities participated in during last 12 months, total population aged 15 years and over, by problem gambling level (unadjusted prevalence)
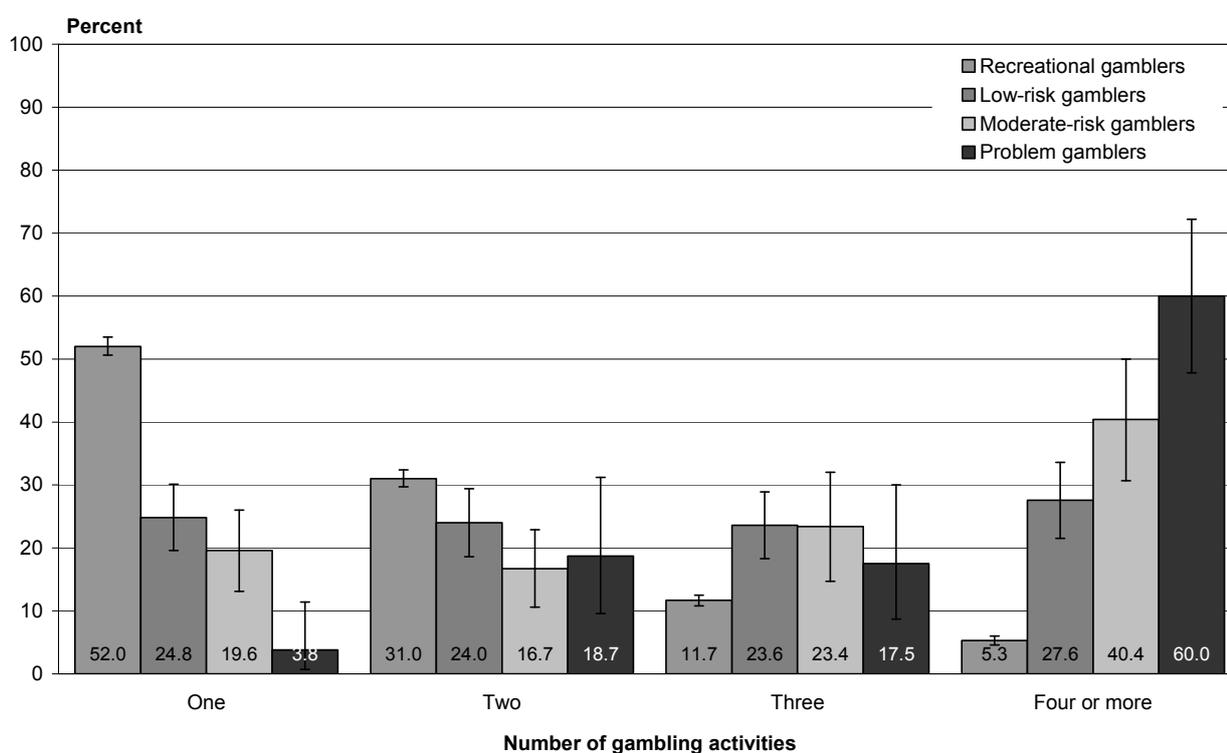
Source: 2006/07 New Zealand Health Survey

Participation in gambling activities in last 12 months

Table 13 presents the rates of participation in different gambling activities in the past year, by problem gambling level. These results show that while 84.2% (75.5–92.9) of problem gamblers had played Lotto in the past 12 months, only 0.5% (0.0–2.6) of problem gamblers had played *only* Lotto in the past 12 months.

Over nine in ten problem gamblers (93.0%, 87.4–98.5) had gambled on a gaming machine in the last 12 months, either in a casino, pub or club. This proportion decreased with decreasing severity of gambling problems, to three in four moderate-risk gamblers (74.2%, 66.6–81.8), just over one in two low-risk gamblers (57.6%, 51.5–63.6), and one in five other past-year gamblers (19.4%, 18.1–20.7).

Table 13: Past-year participation in specific types of gambling activities, by problem gambling level, total population aged 15 years and over (unadjusted prevalence)

Gambling activity	Past-year participation (95% CI)			
	Prevalence (%) for problem gamblers	Prevalence (%) for moderate-risk gamblers	Prevalence (%) for low-risk gamblers	Prevalence (%) for recreational gamblers
Any non-Lotto gambling activity	99.5 (97.4–100.0)	93.2 (89.2–97.3)	88.0 (84.5–91.5)	59.5 (58.1–60.9)
Lotto only	0.5 (0.0–2.6)	6.8 (3.3–12.1)	12.0 (8.5–15.5)	40.4 (39.0–41.9)
Lotto	84.2 (75.5–92.9)	79.7 (73.0–86.3)	78.0 (73.2–82.7)	85.0 (84.0–86.0)
Instant Kiwi or other scratch ticket	67.3 (56.1–78.5)	50.7 (42.0–59.5)	49.2 (43.7–54.7)	39.7 (38.4–41.1)
Non-casino gaming machines	81.7 (72.3–91.1)	62.3 (53.5–71.1)	40.8 (34.6–46.9)	12.6 (11.6–13.7)
Track betting	28.5 (16.4–43.4)	32.3 (22.9–41.7)	28.2 (21.8–34.6)	11.9 (10.8–12.9)
Casino gaming machines	54.7 (43.6–65.9)	36.3 (28.2–44.4)	31.2 (25.2–37.2)	9.9 (8.8–11.0)
Sports betting	28.9 (16.1–44.8)	26.1 (17.2–35.0)	19.0 (13.8–24.1)	6.8 (6.1–7.5)
Casino table games	15.9 (6.8–29.5)	12.4 (6.9–20.0)	11.1 (7.4–14.7)	2.5 (2.0–3.0)
Keno (not in a casino)	17.9 (9.7–28.9)	13.0 (7.9–18.0)	7.9 (4.9–11.0)	1.7 (1.4–2.1)
Housie	14.8 (6.6–26.9)	8.4 (4.5–14.1)	6.0 (3.2–8.8)	1.9 (1.5–2.3)
Internet-based gambling	3.1 (0.3–11.2)	6.0 (2.0–13.2)	2.8 (1.3–5.2)	0.4 (0.2–0.6)
Any gaming machine (casino or non-casino)	93.0 (87.4–98.5)	74.2 (66.6–81.8)	57.6 (51.5–63.6)	19.4 (18.1–20.7)
Any casino gambling (table games or gaming machines)	54.7 (43.6–65.9)	39.5 (31.0–48.1)	34.6 (28.6–40.5)	11.4 (10.3–12.5)

Problem gambling prevalence by past-year gambling behaviour

Table 14 presents the prevalence of problem gambling and moderate-risk gambling, according to past-year participation in different types of gambling activities. Among people who had played Lotto in the past year, 0.6% (0.4–0.8) were problem gamblers, and a further 1.9% (1.5–2.2) were moderate-risk gamblers. Overall, 1 in 40 (2.5%, 2.1–2.9) past-year Lotto players were problem or moderate-risk gamblers. Among people who had played on non-casino gaming machines in the past year, 1 in 30 (3.4%, 2.2–4.5) were problem gamblers, and a further 1 in 13 were moderate-risk gamblers. Overall, this meant that 1 in 9 (11.4%, 9.2–13.6) past-year non-casino gaming machine players were either problem or moderate-risk gamblers.

There were similar findings among people who had played casino table games, Keno (not in a casino) and housie. The prevalence of problem gambling was 3.1% (1.3–6.3) among people who had played casino table games in the past year, 4.8% (2.4–8.3) among past-year Keno players, and 4.1% (1.7–8.0) among past-year housie players. The combined prevalence of problem and moderate-risk gambling was also higher for past-year players of these three gambling types (casino table games: 10.7%, 6.4–15.1; Keno: 15.6%, 10.3–20.9; and housie 11.3%, 6.6–16.0).

Table 14: Prevalence of problem gambling by past-year participation in specific types of gambling activities, total population aged 15 years and over (unadjusted prevalence)

Past-year gambling group (by gambling activity)	Prevalence (%) for total adults (95% CI)		
	Problem gambling	**Moderate-risk gambling**	**Combined problem and moderate-risk gambling**
Among past-year gamblers	0.6 (0.5–0.8)	2.0 (1.7–2.3)	2.7 (2.3–3.0)
Among past-year Lotto players	0.6 (0.4–0.8)	1.9 (1.5–2.2)	2.5 (2.1–2.9)
Among past-year Instant Kiwi (or other scratch ticket) players	1.1 (0.7–1.4)	2.5 (1.9–3.2)	3.6 (2.8–4.4)
Among past-year non-casino gaming machines gamblers	3.4 (2.2–4.5)	8.0 (6.2–9.8)	11.4 (9.2–13.6)
Among past-year track betting gamblers	1.4 (0.7–2.5)	4.9 (3.3–6.5)	6.3 (4.4–8.2)
Among past-year casino gaming machines gamblers	3.0 (1.8–4.1)	6.2 (4.6–7.7)	9.1 (6.9–11.4)
Among past-year sports betting gamblers	2.3 (1.2–4.0)	6.6 (4.1–9.1)	8.9 (6.0–11.7)
Among past-year casino table games gamblers	3.1 (1.3–6.3)	7.6 (4.3–12.4)	10.7 (6.4–15.1)
Among past-year Keno (not in a casino) gamblers	4.8 (2.4–8.3)	10.8 (6.3–15.4)	15.6 (10.3–20.9)
Among past-year housie gamblers	4.1 (1.7–8.0)	7.3 (3.9–12.2)	11.3 (6.6–16.0)

Among past-year internet-based gamblers	3.2 (0.3–12.2)	19.4 (6.8–39.3)	22.6 (9.3–41.8)

Source: 2006/07 New Zealand Health Survey

It is helpful to interpret these findings in the context of other results presented in this report. For example, results suggest that 15.6% of all past-year Keno players are problem or moderate-risk gamblers (Table 14). However, only 1.6% of the total adult population had played Keno in the past 12 months (Table 5), and approximately 80% of these past-year Keno players had played three or more gambling activities in the past year, compared to 20% of all past-year gamblers (Table A1 in the appendix). This may reflect how people with gambling problems tend to play on a wider variety of gambling activities compared to non-problematic gamblers, and suggests that it is not necessarily possible to use these results to determine the problematic form(s) of gambling for individuals.

CPGI items

Table 15 presents the responses to the nine individual questions included as the Canadian Problem Gambling Index (CPGI) in the 2006/07 New Zealand Health Survey. These results show that 1 in 30 people (3.1%, 2.7–3.4) had bet more than they could afford in the last 12 months, and 1 in 50 people (2.1%, 1.9–2.4) had felt guilty about their gambling in the past year.

Overall, 0.8% (0.6–1.0) of the adult population reported that gambling had caused health problems, such as stress or anxiety, in the past 12 months.

Table 15: Responses to individual CPGI items: prevalence of experiencing gambling behaviours in the last 12 months, among the total population aged 15 years and over (unadjusted prevalence)

Area	Indicator	Prevalence (%) for total adults (95% CI)	Estimated number of adults (95% CI)
Loss of control	Betting more than could afford	3.1 (2.7–3.4)	96,000 (84,300–106,100)
Motivation	Needing to gamble with more money to get same feeling of excitement	1.0 (0.8–1.2)	31,100 (25,000–37,400)
Chasing	Returning later to win back losses	1.7 (1.5–2.0)	53,700 (46,800–62,400)
Borrowing	Borrowing money or selling items to get money to gamble	0.4 (0.3–0.5)	12,400 (9,400–15,600)
Problem recognition	Feeling might have a problem with gambling	1.2 (1.0–1.4)	36,600 (31,200–43,700)
Criticism	Other people criticising gambling	1.4 (1.2–1.6)	43,600 (37,400–49,900)
Feelings of guilt	Feeling guilty about gambling	2.1 (1.9–2.4)	67,000 (59,300–74,900)
Negative effects on health	Gambling causing health problems including stress or anxiety	0.8 (0.6–1.0)	24,800 (18,700–31,200)

| Financial problems | Gambling causing financial problems for oneself or household | 0.8 (0.6–1.0) | 25,700 (18,700–31,200) |

Source: 2006/07 New Zealand Health Survey

Note: Includes the responses 'sometimes', 'most of the time' and 'always'.

Chapter 5: Problem Gambling and Health

Key findings

- Problem gambling was strongly associated with current smoking and hazardous alcohol consumption. Increased severity of gambling problems was associated with increased prevalence of tobacco use, as well as increased prevalence of hazardous drinking.

- Compared to people with no gambling problems, problem gamblers had:
  - 3.73 (1.91–7.28) times the odds of being a current smoker
  - 5.20 (2.70–10.01) times the odds of having hazardous drinking behaviour

  even when accounting for possible confounding factors (ie, sex, age group, prioritised ethnic group, household size, work status, education level, NZDep2006 quintiles and urban/rural status).

- Problem and moderate-risk gamblers were significantly more likely to have a high or very high probability of an anxiety or depressive disorder, compared to people with no gambling problems, after adjusting for possible confounding factors (ie, sex, age group, prioritised ethnic group, household size, education level, NZDep2006 quintiles and urban/rural status).

- Problem gamblers were significantly more likely to have worse self-rated health on a number of SF-36 health domains, after adjusting for age.

- Nine in 10 (91.6%, 86.3–97.0) problem gamblers had visited a general practitioner in the last 12 months, compared to eight in ten people with no gambling problems (81.2%, 80.2–82.2).

- One in six problem gamblers (17.0%, 8.0–30.0) had visited a psychologist, counsellor or social worker in the past 12 months, compared to 3.4% (3.0–3.8) of people with no gambling problems.

Introduction

This section examines associations between problem gambling and other health-related issues, such as:

- current cigarette smoking
- hazardous drinking (AUDIT)
- fair or poor general health
- high or very high probability of anxiety or depressive disorder (K10).

Descriptive analyses have also been presented for self-rated health (SF-36), as well as for past-year use of health services, including seeing a general practitioner (GP), or a psychologist, counsellor or social worker. Although the reasons for these visits are not known, this is still valuable information about whether people with gambling problems are accessing health care in New Zealand.

Current smoking

Introduction

Tobacco smoking has long been known to be a major cause of death and ill health. Smoking is the main cause of lung cancer and chronic obstructive pulmonary disease (COPD), and is a primary risk factor for cardiovascular disease, cancers of the mouth, oesophagus, pharynx and larynx, and many other cancers and chronic diseases (Ministry of Health 2008a). Previous studies have suggested a link between smoking and gambling problems (Abbott 2001; Ministry of Health 2006a; Petry and Oncken 2002; SERCIS 2001).

In the 2006/07 New Zealand Health Survey participants were asked a series of questions about their smoking habits, including the frequency and quantity of tobacco smoking. A current smoker, based on the World Health Organization (WHO) definition, is someone who has smoked more than 100 cigarettes in their lifetime and is currently smoking at least once a month (World Health Organization 1998).

Results

In the total adult population aged 15 years and over the prevalence of current smoking was 19.9% (95% CI 18.9–20.8). Figure 25 shows that the prevalence of current smoking increased with increasing severity of gambling problems, for both males and females. The prevalence of current smoking was highest among problem gamblers, with three in four male problem gamblers (76.3%, 56.8–90.0) and one in two female problem gamblers (58.4%, 35.5–79.0) being current smokers.

Figure 25: Prevalence of current smoking among problem gamblers and adults aged 15 years and over, by gender (unadjusted prevalence)
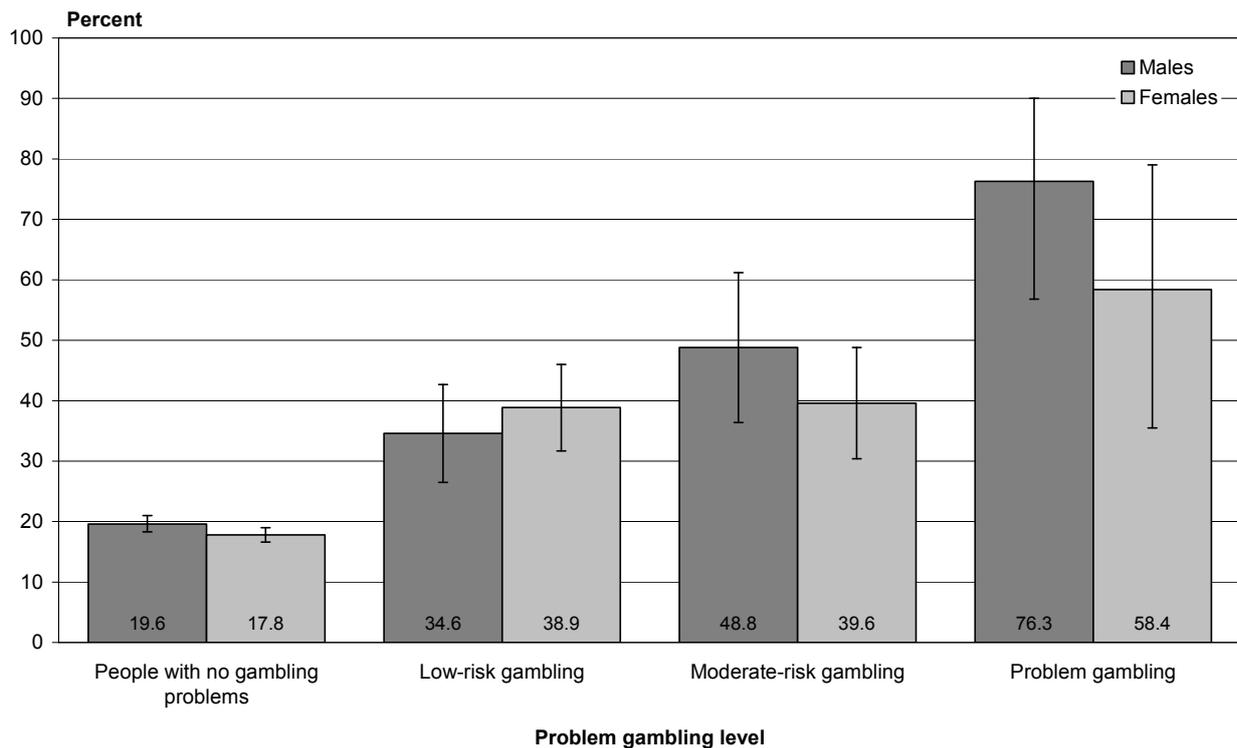
Source: 2006/07 New Zealand Health Survey

Note: 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

After adjusting for possible confounding variables, the association between current smoking and problem gambling status remained significant. Table 16 shows that problem gamblers had over 3.7 times the odds of being a current smoker, than people who were not experiencing gambling problems (that is, who were not problem, moderate-risk or low-risk gamblers).

Table 16: Odds ratio of being a current smoker, by gambling level, adjusting for other possible confounders

Gambling level	Odds ratio (95% CI)	p-value
Problem gambling	3.73 (1.91–7.28)	0.0002
Moderate-risk gambling	2.26 (1.39–3.67)	0.0013
Low-risk gambling	2.00 (1.55–2.60)	< 0.0001
People with no gambling problems	1	–

Source: 2006/07 New Zealand Health Survey

Note: Logistic regression analysis controlled for sex, age group, prioritised ethnic group, household size, work status, education level, NZDep2006 quintiles and urban/rural status. 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

Hazardous drinking behaviour

Introduction

Alcohol is the most commonly used recreational drug in New Zealand, with the majority of New Zealanders consuming alcohol at least occasionally (Ministry of Health 2007). Excess consumption of alcohol causes a range of adverse effects on health, including cirrhosis of the liver, pancreatitis, gastritis, high blood pressure, haemorrhagic stroke, and several cancers. Alcohol also contributes to death and injury due to traffic accidents, drowning, suicide, assaults and domestic violence (Conner et al 2005). High levels of alcohol use are also associated with alcohol dependence and abuse. Studies have shown possible links between hazardous drinking behaviour and gambling problems (Abbott 2001; Ministry of Health 2006a; Toneatto et al 2002; Welte, Wieczorek, Barnes et al 2004; Welte, Wieczorek, Tidwell et al 2004).

In the 2006/07 New Zealand Health Survey, adult participants who had consumed an alcoholic drink in the past 12 months were asked 10 questions about their alcohol use, called the Alcohol Use Disorders Identification Test (AUDIT). The AUDIT questionnaire covers the volume and frequency of alcohol consumption, alcohol-related problems and abnormal drinking behaviour, and was developed by the World Health Organization (Babor et al 1992). Each question is scored from 0 to 4, and the questionnaire has a maximum score of 40.

In this report, the definition of hazardous drinking is an AUDIT score of 8 or more, representing an established pattern of drinking that carries a high risk of future damage to physical or mental health, but may not yet have resulted in significant adverse effects (Babor et al 2001).

Results

In the total adult population, the prevalence of hazardous drinking behaviour was 17.7% (16.8–18.5). Figure 26 shows that the prevalence of hazardous drinking increased significantly with severity of gambling problems. Among both males and females, people with at least low-risk gambling were significantly more likely to have hazardous drinking behaviour, compared to other people. Three in four male problem gamblers (72.6%, 51.3–88.4) and one in three female problem gamblers (37.6%, 17.0–62.1) had hazardous drinking behaviour.

Figure 26: Prevalence of hazardous drinking behaviour, by problem gambling level and gender, among adults aged 15 years and over (unadjusted prevalence)
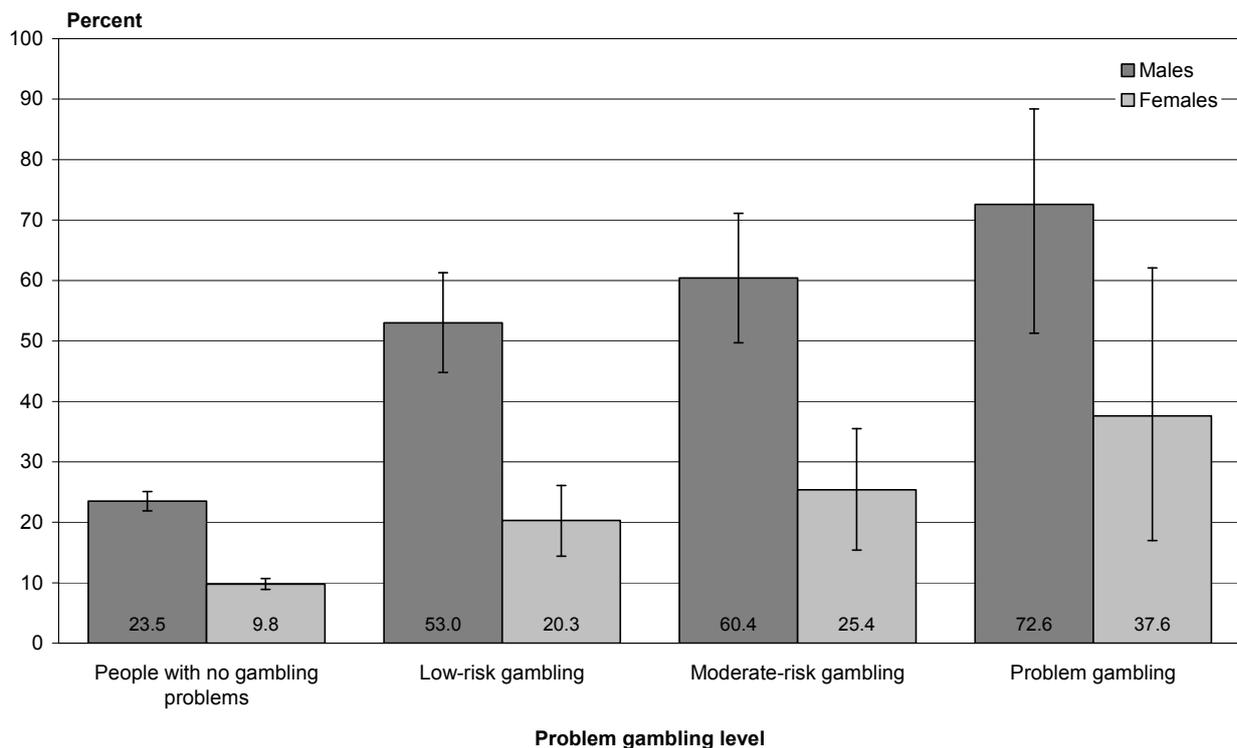
Source: 2006/07 New Zealand Health Survey

Note: 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

After adjusting for confounding, there still remained an association between hazardous drinking behaviour and problem gambling, with the relationship showing a dose-response effect. Problem gamblers had over five times the odds (odds ratio: 5.20, 2.70–10.01) of having hazardous drinking behaviour, compared to people with no gambling problems.

Table 17: Odds ratio of hazardous drinking, by gambling level, adjusting for other possible confounders

Gambling level	Odds ratio (95% CI)	p-value
Problem gambling	5.20 (2.70–10.01)	< 0.0001
Moderate-risk gambling	4.08 (2.75–6.03)	< 0.0001
Low-risk gambling	2.91 (2.18–3.89)	< 0.0001
People with no gambling problems	1	–

Source: 2006/07 New Zealand Health Survey

Notes: Logistic regression analysis controlled for sex, age group, prioritised ethnic group, household size, work status, education level, NZDep2006 quintiles and urban/rural status. 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

Fair or poor general health

Introduction

Adult participants in the New Zealand Health Survey were asked to summarise their perception of their own health status by indicating whether, in general, they would say their health was *excellent, very good, good, fair* or *poor.*

This internationally used question, known as the general self-rated health summary, is simple, encompassing both mental and physical health status. The question has been found to be a powerful predictor of future health care use and mortality, independent of other medical, lifestyle or psychosocial risk factors (Idler and Benyamini 1997; McCallum et al 1994; Miilunpalo et al 1997). Previous studies have suggested a link between worse self-rated health and problem gambling (Ministry of Health 2006a; SERCIS 2001; Volberg et al 1999).

Results

In the total adult population, the prevalence of having fair or poor general health was 10.3% (9.6–11.0). Figure 27 shows that the prevalence of rating general health as fair or poor generally increased with increasing severity of gambling problems, although the results for problem gambling had wide confidence intervals, indicating uncertainty in these results.

Figure 27: Prevalence of having fair or poor general health, among problem gamblers and among adults aged 15 years and over (unadjusted prevalence)
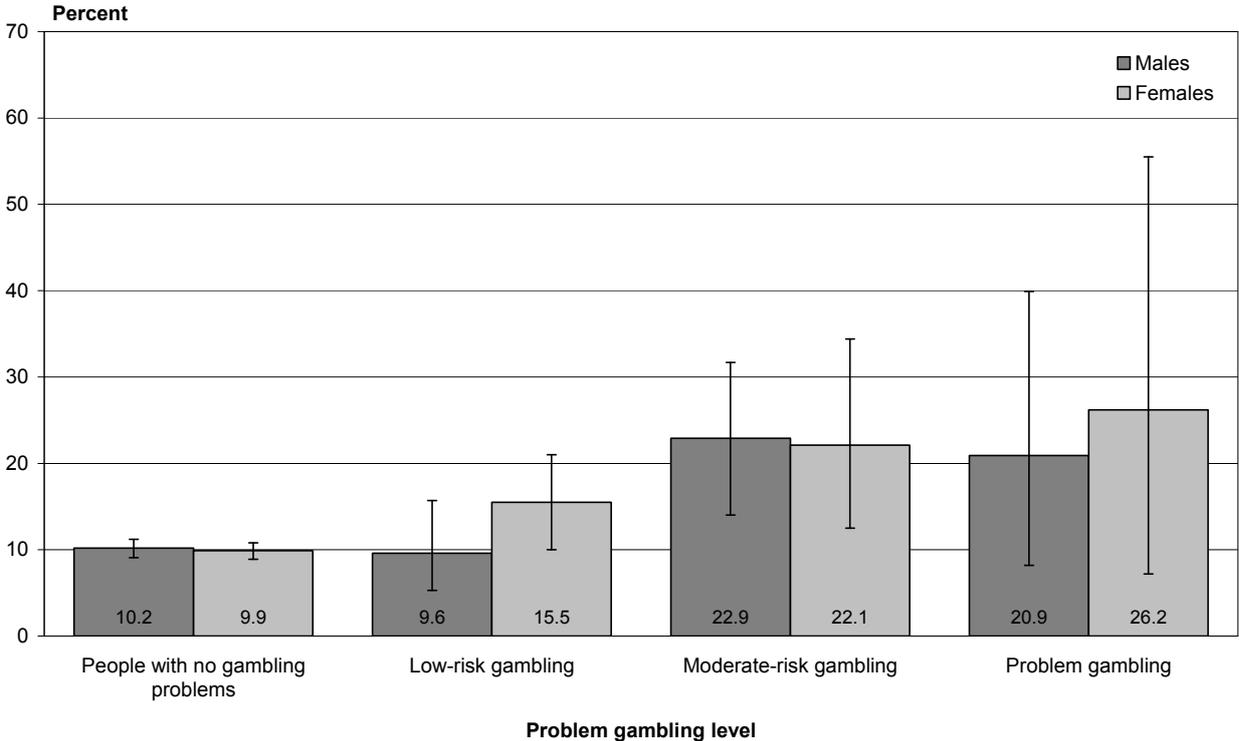
Source: 2006/07 New Zealand Health Survey

Note: 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

After adjusting for confounding, a similar relationship remained. Moderate-risk gamblers had significantly higher odds of rating their health as fair or poor compared to people with no gambling problems (Table 18). Although problem gamblers and low-risk gamblers also had higher odds of having fair or poor general health, these results were not statistically significant.

Table 18: Odds ratio of having fair or poor general health, by gambling level, adjusting for other possible confounders

Gambling level	Odds ratio (95% CI)	p-value
Problem gambling	1.89 (0.93–3.86)	0.0783
Moderate-risk gambling	2.14 (1.41–3.25)	0.0005
Low-risk gambling	1.19 (0.84–1.70)	0.3297
People with no gambling problems	1	–

Source: 2006/07 New Zealand Health Survey

Notes: Logistic regression analysis controlled for sex, age group, prioritised ethnic group, household size, education level, NZDep2006 quintiles and urban/rural status. 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

Psychological distress

Introduction

The Kessler 10-item Scale (K10) is a set of 10 questions used internationally to screen populations for non-specific psychological distress and serious mental illness (Kessler et al 2003). Many studies have found that the higher the K10 score, the more likely it is that a respondent has symptoms that meet the criteria for any mental disorder using the Diagnostic and Statistical Manual of Mental Disorders criteria (American Psychiatric Association 1994), especially anxiety and mood disorders (Furukawa et al 2003; Kessler et al 2002). There is a strong association between a K10 score of 12 or more and having a mental disorder, both for the previous month and the previous 12 months (Andrews and Slade 2001).

In the 2006/07 New Zealand Health Survey, adult participants were asked to recall how often in the past four weeks they felt:
1. tired out for no good reason
2. nervous
3. so nervous that nothing could calm them down
4. hopeless
5. restless or fidgety
6. so restless they could not sit still
7. depressed
8. so depressed that nothing could cheer them up
9. worthless
10. that everything was an effort.

Responses are based on a five-point scale from 'None of the time' to 'All of the time', and scored from 0 to 4.

In keeping with other studies (M Oakley Brown, personal communication, 25 March 2008), participants were said to have the following likelihood of an anxiety or depressive disorder by categorising the K10 scores as follows:
- no or low probability (K10 score of 0–5)
- moderate probability (K10 score of 6–11)
- high probability (K10 score of 12–19)
- very high probability (K10 score of 20–40).

Previous studies have shown associations between gambling problems and having mental health issues (Abbott and Volberg 1992; SERCIS 2001; Volberg et al 1999).

Results

In the total adult population the prevalence of psychological distress (ie, having a high or very high probability of an anxiety or depressive disorder according to the K10 screen) was 6.6% (6.0–7.1). Figure 28 shows that there appears to be an increase in the prevalence of having a high or very high probability of anxiety or depressive disorder with increased problem gambling severity. However, there were different patterns for males and females.

Among males, one in five (20.9%, 13.1–28.7) problem and moderate-risk gamblers were at high or very high probability of anxiety or depressive disorder. This was significantly higher than for males at all other gambling levels. For males there were no significant differences in the prevalence of psychological distress between those with low-risk gambling and those with no gambling problems.

By contrast, females with low-risk, moderate-risk or problem gambling were significantly more likely to have a high or very high probability for an anxiety or depressive disorder, compared to females with no gambling problems (Figure 28).

Figure 28:   Prevalence of high or very high probability of anxiety or depressive disorder, among problem gamblers and among adults aged 15 years and over (unadjusted prevalence)
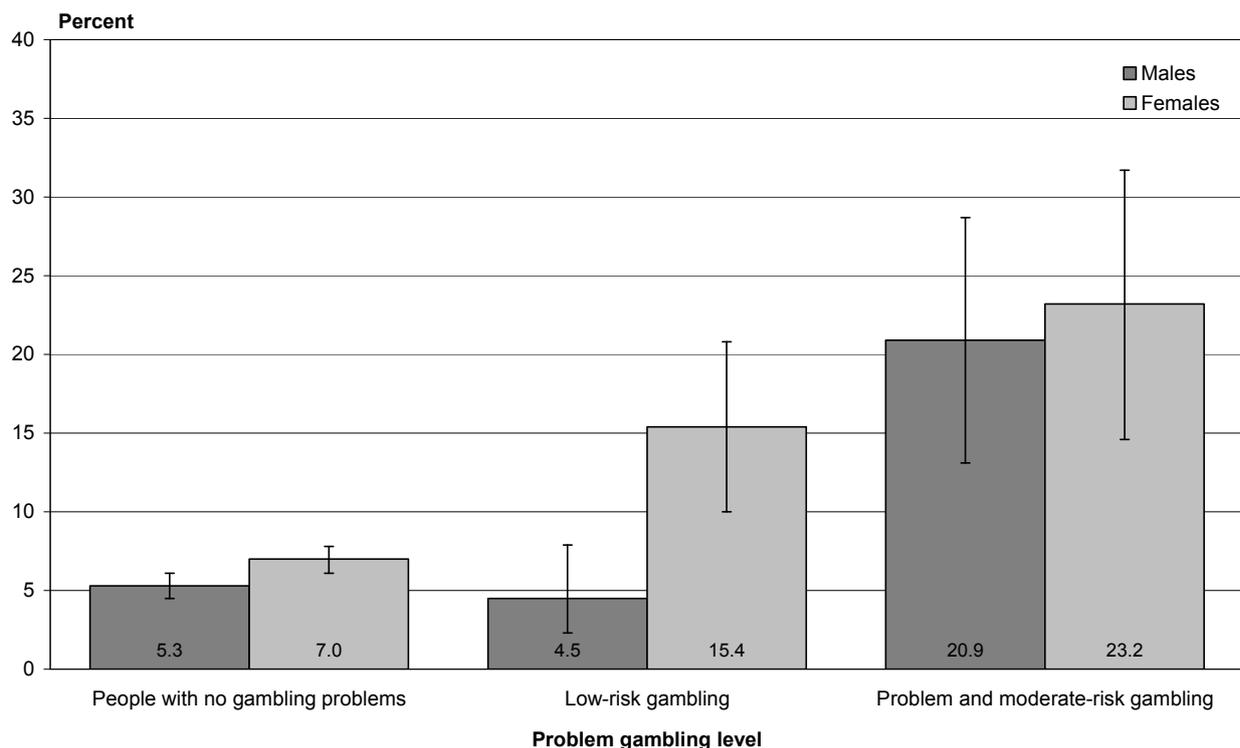
Source: 2006/07 New Zealand Health Survey

Notes: Having a high or very high probability of anxiety or depressive disorder is defined as having a score of 12 or more on the Kessler 10-item (K10) scale. Problem gambling and moderate-risk gambling were combined due to wide confidence intervals. 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

This same pattern by gender was evident when examining the association between problem gambling levels and psychological distress, after controlling for confounding (Table 19). For males, problem and moderate-risk gamblers had significantly higher odds of having a high or very high probability of anxiety or depressive disorder, compared to people with no gambling problems, while low-risk gamblers had similar odds to those with no gambling problems. However, for females, being either a low-risk, moderate-risk or problem gambler was associated with significantly higher odds of having a high or very high probability of anxiety or depressive disorder compared to females with no gambling problems.

Table 19: Odds ratio of having a high or very high risk of anxiety or depressive disorder, by gambling level, adjusting for other possible confounders

Gambling level in past year	Males		Females	
	Odds ratio (95% CI)	p-value	Odds ratio (95% CI)	p-value
Problem and moderate-risk gambling	3.49 (2.11–5.76)	< 0.0001	2.64 (1.59–4.38)	0.0002
Low-risk gambling	0.68 (0.34–1.33)	0.2560	2.01 (1.34–3.01)	0.0007
People with no gambling problems	1		1	

Source: 2006/07 New Zealand Health Survey

Note: Logistic regression analysis controlled for sex, age group, prioritised ethnic group, household size, education level, NZDep2006 quintiles and urban/rural status. 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

Self-rated health (SF-36)

Introduction

Self-rated health is an important indicator of health and wellbeing. Studies have shown associations between gambling problems and reporting worse self-rated health (Ministry of Health 2006a; SERCIS 2001; Volberg et al 1999).

The SF-36 is a widely-used standard set of 36 questions that asks about people's physical and mental self-rated health across eight health domains. The 2006/07 New Zealand Health Survey included the New Zealand edition for version 2 of the SF-36.

For each of the eight health domains a series of questions are asked, which are used to derive an overall score for the domain. These scores range from 0 (worse self-rated health) to 100 (better self-rated health). Table 20 presents the interpretation of scores for the eight health domains included in the SF-36.

Table 20: Interpretation of SF-36 domain scores

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

Source: Ministry of Health 2008a

Note: A four-week recall period is used in all domains, except GH, which uses an 'in general' recall period.

Interpretation of the SF-36 is based on the mean average scores. The domains are independent of each other and domain scores cannot be compared. However, within each domain, means for population subgroups (eg, people of different gambling levels) can be compared. The ordering of the domains used in this report is an international standard, with the order from left to right representing the extent to which each scale measures physical health (closer to the left) or mental health (closer to the right).

Results

Figure 29 shows that people with increasing severity of gambling problems were significantly more likely to report worse self-rated health, on almost all of the health domains, and particularly on the domains of mental health (MH) and role emotional (RE).

Figure 29: Mean SF-36 scores for adults, by gambling status (age-standardised)
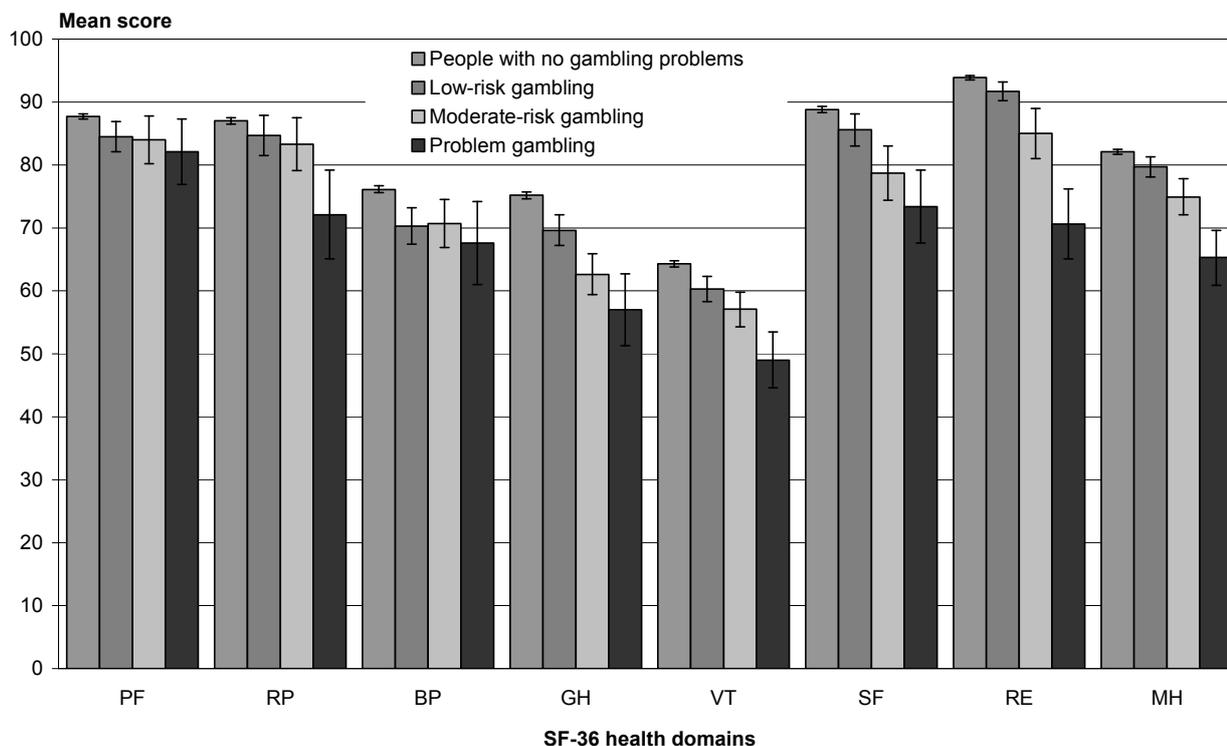
Source: 2006/07 New Zealand Health Survey

Note: 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

Use of health services

This section examines the use of health services by people experiencing gambling problems. The following use of health services in the last 12 months was examined:

- use of GP in the last 12 months
- unmet need for GP in the last 12 months (including due to cost)
- use of psychologist, counsellor or social worker.

Results

Table 21 shows that nine in ten (91.6%, 86.3–97.0) problem gamblers had seen a GP in the past 12 months. This was significantly higher than for people experiencing no gambling problems (81.2%, 80.2–82.2). Moderate-risk gamblers were significantly more likely to have had unmet need for a GP in the last 12 months (17.4%, 11.3–23.4), compared to people with no gambling problems (6.0%, 5.5–6.6). While the prevalence for unmet need was also higher for problem gamblers (12.0%, 5.6–21.5) than for people with no gambling problems, this was not statistically significant. However, low-risk gamblers, moderate-risk gamblers and problem gamblers were all significantly more likely to have had unmet need for a GP in the last 12 months due to cost, compared to people with no gambling problems.

These results also showed that one in six problem gamblers (17.0%, 8.0–30.0) had seen a psychologist, counsellor or social worker in the previous 12 months. This was significantly higher than for low-risk gamblers (4.5%, 2.5–7.2) and people not experiencing gambling problems (3.4%, 3.0–3.8).

Table 21: Use of health care services in the previous 12 months, by CPGI category (unadjusted prevalence)

Use of health care services	Use of health care services in past 12 months (95% CI)				
	Prevalence (%) for problem gamblers	Prevalence (%) for moderate-risk gamblers	Prevalence (%) for low-risk gamblers	Prevalence (%) for people with no gambling problems	Prevalence (%) for total adults
Saw a GP in the previous 12 months	91.6 (86.3–97.0)	80.7 (73.9–87.5)	83.7 (79.1–88.2)	81.2 (80.2–82.2)	81.3 (80.3–82.3)
Unmet need for GP services in previous 12 months	12.0 (5.6–21.5)	17.4 (11.3–23.4)	9.6 (6.7–12.4)	6.0 (5.5–6.6)	6.3 (5.8–6.9)
Unmet need for GP services in previous 12 months due to cost	5.8 (2.1–12.5)	7.7 (4.1–12.9)	3.8 (2.0–6.5)	1.5 (1.2–1.8)	1.7 (1.4–1.9)
Saw a psychologist, counsellor or social worker in the previous 12 months	17.0 (8.0–30.0)	4.3 (1.5–9.4)	4.5 (2.5–7.2)	3.4 (3.0–3.8)	3.5 (3.1–3.9)

Source: 2006/07 New Zealand Health Survey

Note: 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers (that is, those people who were not classified as low-risk, moderate-risk or problem gamblers).

There were similar results when adjusting for age.

Chapter 6: People Affected by Problem Gambling

Key findings

- Overall, approximately 2.8% (95% confidence interval 2.5–3.1) of people aged 15 years and over had experienced problems in the last 12 months due to someone's gambling. This represented an estimated total of 87,000 adults in the New Zealand population.

- A large proportion of adults who had experienced problems due to someone's gambling in the last 12 months reported that the problems were due to gaming machines: either non-casino gaming machines (53.0%, 47.5–58.6) or casino gaming machines (33.0%, 27.8–38.2).

- Of those people who had experienced problems in the last 12 months due to someone's gambling, approximately 20% (17,300 adults) had not gambled in the last 12 months, a further 55% (48,000 adults) were recreational gamblers with no reported gambling problems, and an estimated 25% were low-risk, moderate-risk or problem gamblers.

- Māori and Pacific males and females were between two and three times more likely to have experienced problems due to someone's gambling in the last 12 months, compared to males and females in the total population.

- Adults living in NZDep2006 quintile 5 (most deprived) areas were over twice as likely to have experienced problems due to someone's gambling, compared to adults living in NZDep2006 quintiles 1 and 2 (least deprived) areas, after adjusting for age.

Introduction

Problem gambling can affect not only the gamblers themselves but also the people around them. These may include significant others, such as spouses, partners, children, parents, whānau, friends and work colleagues, and the wider community. This section examines the prevalence of experiencing problems due to someone's gambling in the last 12 months.

In the 2006/07 New Zealand Health Survey, all adult participants (aged 15 years and over) were asked whether they had experienced problems due to someone's gambling in the last 12 months, irrespective of whether or not they had gambled in the last 12 months. Readers should note that this wording allows for the participant to report problems due to their own gambling, as well as due to other people's gambling, so that the total number of adults in the population affected by problem gambling can be monitored.

People reporting that they had experienced problems due to someone's gambling in the last 12 months were asked whether they knew which gambling activity was involved. They were allowed to report multiple gambling activities.

Experiencing problems due to someone's gambling

Overall, 2.8% (95% confidence interval 2.5–3.1) of people aged 15 years and over had experienced problems due to someone's gambling in the past 12 months. This represented approximately 87,000 adults in the New Zealand population.

Gambling activity involved

The majority of people experiencing problems reported that gaming machines were involved, either machines not in casinos (53.0%, 47.5–58.6) or those in casinos (33.0%, 27.8–38.2) (Figure 30).

Figure 30: Gambling activity involved in causing problems, reported by people experiencing problems due to someone's gambling (unadjusted prevalence)
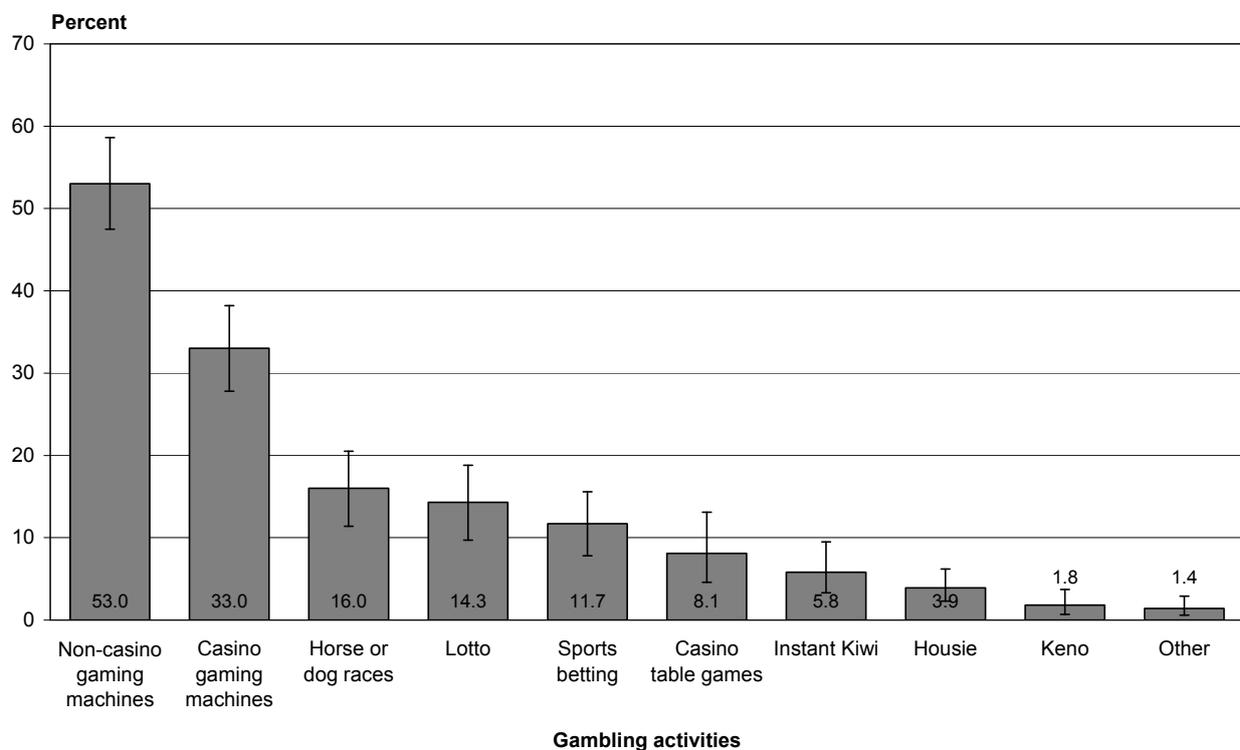
Source: 2006/07 New Zealand Health Survey

Note: Multiple gambling activities could be reported, so percentages may not sum to 100%.

Problem gambling status of people affected

The prevalence of experiencing problems due to someone's gambling increased with increasing severity of gambling problems (Table 22). One in three (38.1%, 25.7–51.7) problem gamblers reported experiencing problems in the past 12 months due to someone's gambling, compared to 2.6% (2.1–3.0) of recreational gamblers and 1.6% (1.2–2.0) of non-gamblers.

Overall, these results suggest that approximately 20% of all people who had experienced problems had not gambled themselves in the past 12 months (17,300 adults out of the total 87,000 adults). A further 55% of people who had experienced problems were recreational gamblers with no reported gambling problems themselves (48,000 adults out of 87,000). An estimated 25% were low-risk, moderate-risk or problem gamblers.

These results indicate that approximately three in four people who had experienced problems in the past 12 months due to someone's gambling were unlikely to be experiencing any problems due to their own gambling (that is, they were either non-gamblers or recreational gamblers).

Table 22: Experienced problems in the last 12 months due to someone's gambling, by problem gambling level (unadjusted prevalence and the estimated number of people affected in the total adult population)

Problem gambling level	Prevalence (%) for total adults (95% CI)	Estimated number of adults (95% CI)
Non-gambler	1.6 (1.2–2.0)	17,300 (13,000–21,600)
Recreational gambler	2.6 (2.1–3.0)	48,000 (39,400–56,300)
Low-risk gambler	10.3 (6.9–13.7)	11,200 (7,500–14,900)
Moderate-risk gambler	13.4 (8.2–18.6)	5,500 (3,400–7,600)
Problem gambler	38.1 (25.7–51.7)	5,000 (3,400–6,800)
Total	2.8 (2.5–3.1)	87,000 (78,000–96,700)

Source: 2006/07 New Zealand Health Survey

Profile of people experiencing problems due to someone's gambling

By gender

There were no significant differences between females (3.3%, 2.8–3.8) and males (2.6%, 2.1–3.2) in experiencing problems due to someone's gambling in the last 12 months, after adjusting for age.

By age group

The proportion of adults experiencing problems from someone's gambling in the last 12 months was similar for the age groups 15–44 years for males and 15–54 years for females. The proportion decreased in the older age groups (Figure 31).

Figure 31: Experienced problems due to someone's gambling in the last 12 months, by age group and gender (unadjusted prevalence)
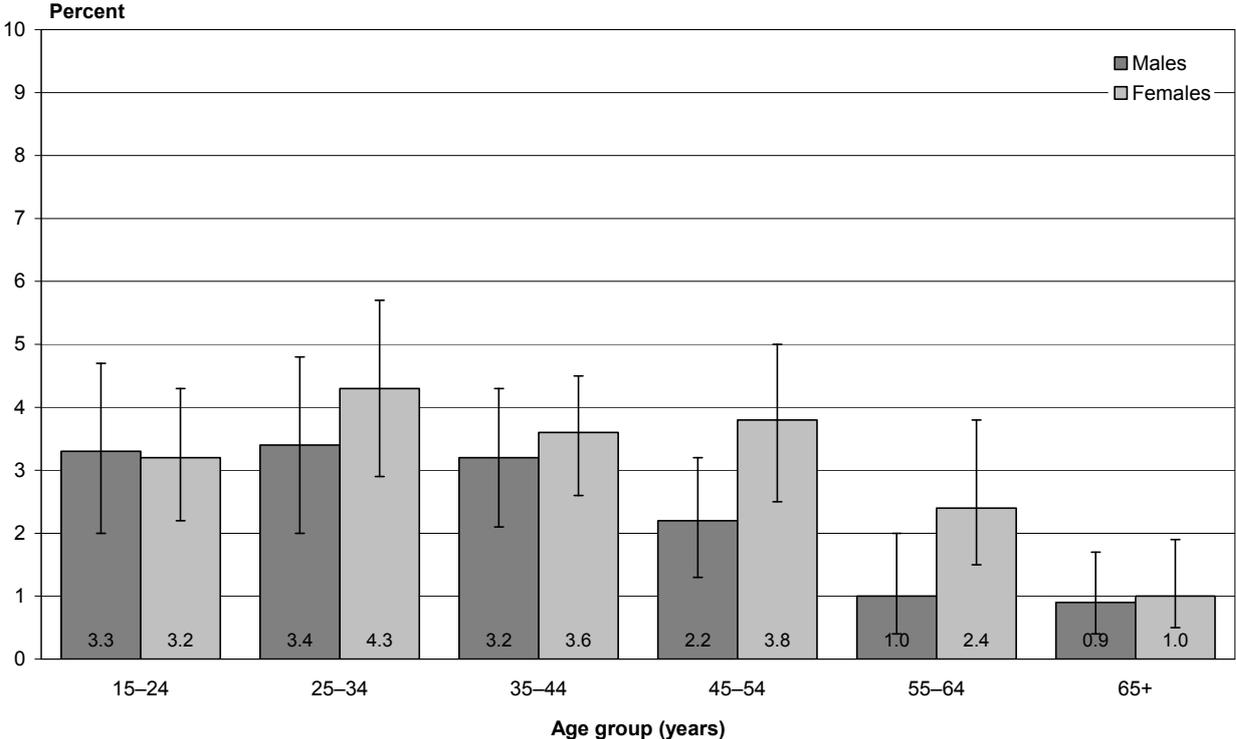
Source: 2006/07 New Zealand Health Survey

By ethnic group

Table 23 presents an indication of the burden of experiencing problems in the last 12 months due to someone's gambling by the main ethnic population groups in New Zealand.

These results show that Māori and Pacific people experienced a high burden of problems due to someone's gambling. One in 12 (8.6%, 6.9–10.3) Māori females and 1 in 20 (5.3%, 3.7–6.8) Māori males had experienced problems due to someone's gambling in the last 12 months. Furthermore, approximately 1 in 13 (7.6%, 5.6–9.7) Pacific people had experienced problems due to someone's gambling.

Table 23: Experienced problems due to someone's gambling in the last 12 months, by ethnic group and gender (unadjusted prevalence)

Ethnic group	Gender	Prevalence (%) for total adults (95% CI)	Estimated number of adults (95% CI)
European/Other	Males	1.9 (1.3–2.4)	22,700 (16,000–29,500)
	Females	2.4 (1.9–2.9)	31,400 (25,200–38,400)
	Total	2.1 (1.8–2.5)	54,100 (45,900–63,800)
Māori	Males	5.3 (3.7–6.8)	8,700 (6,100–11,200)
	Females	8.6 (6.9–10.3)	16,300 (13,100–19,600)
	Total	7.0 (5.9–8.2)	25,000 (21,000–29,100)
Pacific	Males	7.8 (4.2–11.4)	6,100 (3,300–8,900)
	Females	7.5 (4.8–10.2)	6,500 (4,100–8,800)
	Total	7.6 (5.6–9.7)	12,600 (9,200–16,000)
Asian	Males	2.4 (1.0–4.6)	3,100 (1,300–6,000)
	Females	2.1 (1.1–3.6)	3,200 (1,600–5,400)
	Total	2.2 (1.3–3.2)	6,300 (3,600–8,900)

Source: 2006/07 New Zealand Health Survey

Note: Total response ethnic group has been used. Ethnic groups cannot be compared using the unadjusted prevalence estimates presented in this table.

When adjusting for age, Māori males were two times more likely, and Pacific males almost three times more likely, to have experienced problems due to someone's gambling in the last 12 months, compared to males in the total population (Figure 32). Māori and Pacific females were 2.5 times more likely to have experienced problems due to someone's gambling, compared to females in the total population. European/Other males and females and Asian females were significantly less likely to have experienced problems in the last 12 months due to someone's gambling, compared to males and females in the total population.

Figure 32: Experienced problems due to someone's gambling in the last 12 months, by ethnic group and gender (age-standardised rate ratio)
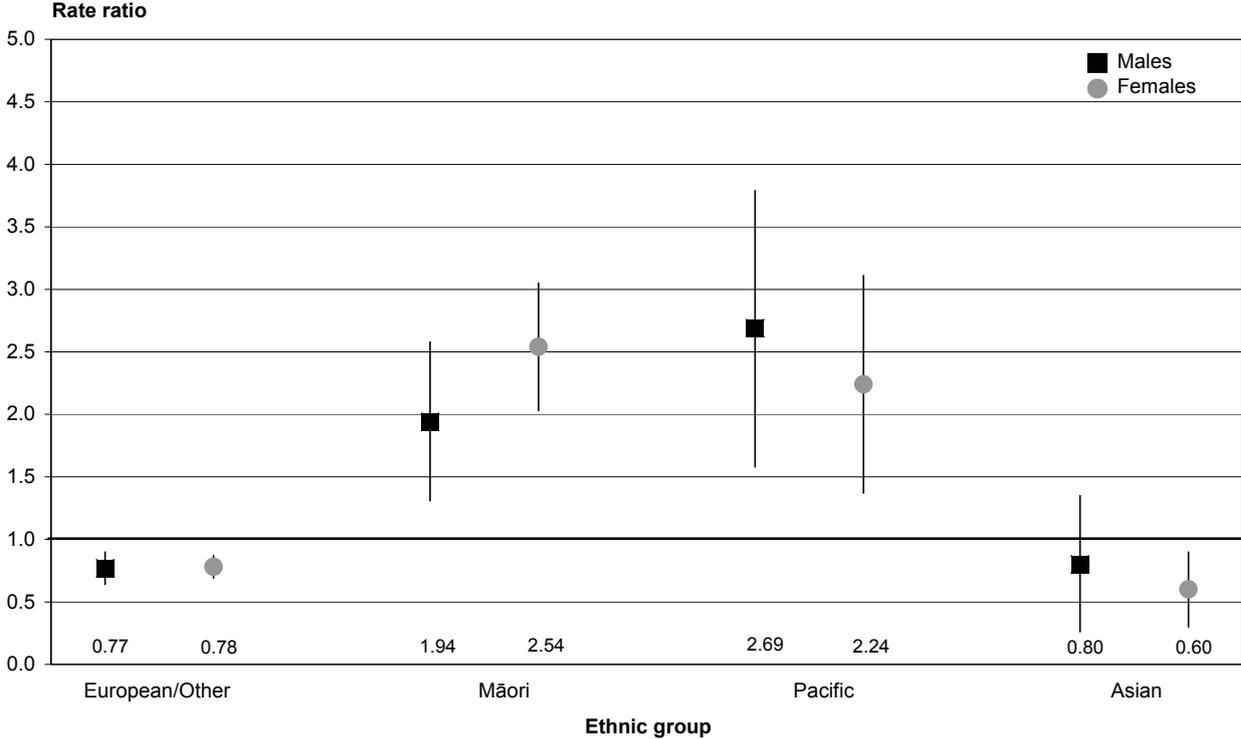
Source: 2006/07 New Zealand Health Survey

Notes: Age-standardised to WHO world population. Reference group, with a rate ratio of 1.0 (indicated by the bold line), is the total male or female population aged 15 years and over. Total response standard output for ethnic groups has been used.

It was also useful to examine these results among only non-gamblers and recreational gamblers, given that these people were unlikely to have experienced problems due to their own gambling. From these results it appears that Māori and Pacific people had a higher burden of experiencing problems due to someone's gambling (Table 24). For example, almost 1 in 20 (4.6%, 2.6–7.5) Pacific non-gamblers had experienced problems due to someone's gambling in the last 12 months.

**Table 24:** Experienced problems due to someone's gambling in the last 12 months, by ethnic group and gender, among non-gamblers and recreational gamblers (unadjusted prevalence)

Ethnic group	Prevalence (%) for non-gamblers (95% CI)	Prevalence (%) for recreational gamblers (95% CI)	Prevalence (%) for all non-gamblers and recreational gamblers (95% CI)
European/Other	1.2 (0.7–1.7)	2.0 (1.6–2.5)	1.8 (1.4–2.1)
Māori	3.8 (2.6–5.1)	6.3 (4.9–7.8)	5.5 (4.5–6.6)
Pacific	4.6 (2.6–7.5)	7.5 (4.4–10.6)	6.0 (4.1–7.9)
Asian	0.9 (0.2–2.5)	2.8 (1.4–4.9)	1.7 (0.9–2.7)
Total	1.6 (1.2–2.0)	2.6 (2.1–3.0)	2.2 (1.9–2.5)

Source: 2006/07 New Zealand Health Survey

Note: Total response ethnic group has been used. Ethnic groups cannot be compared using the unadjusted prevalence estimates presented in this table.

When looking only at non-problem gamblers (ie, people who were either non-gamblers or recreational gamblers), Māori and Pacific males and females were still approximately two to three times more likely to have experienced problems due to someone's gambling, compared to males and females in the total population (after adjusting for age) (Figure 33).

Figure 33: Experienced problems due to someone's gambling in the last 12 months, among non-problem gamblers (combined non-gamblers and recreational gamblers), by ethnic group and gender, (age-standardised rate ratio)
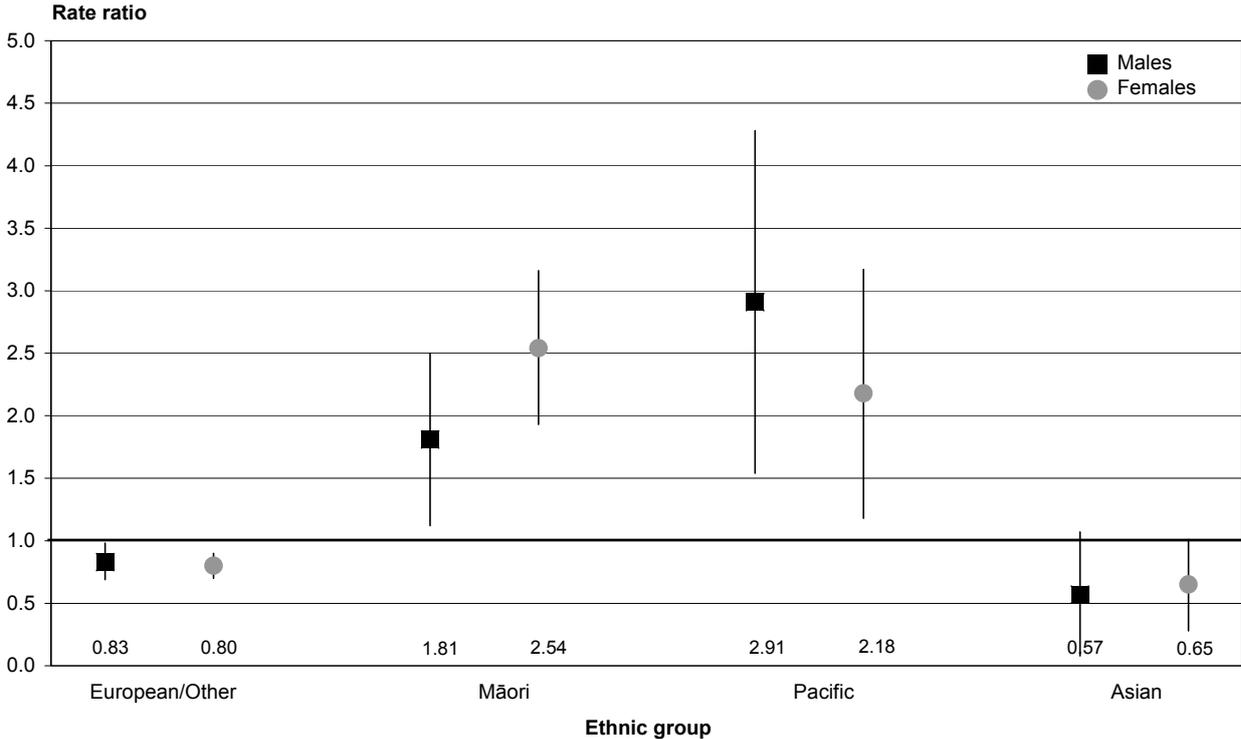
Source: 2006/07 New Zealand Health Survey

Notes: Age-standardised to WHO world population. Reference group, with a rate ratio of 1.0 (indicated by the bold line), is the total male or female population aged 15 years and over. Total response standard output for ethnic groups has been used.

By neighbourhood deprivation

Among both males and females, people living in NZDep2006 quintile 5 (most deprived) areas were significantly more likely to have experienced problems in the last 12 months due to someone's gambling, compared to people living in NZDep2006 quintiles 1, 2 and 3 areas, when adjusting for age (Figure 34).

Figure 34: Experienced problems due to someone's gambling in the last 12 months, by NZDep2006 quintile and gender (age-standardised prevalence)
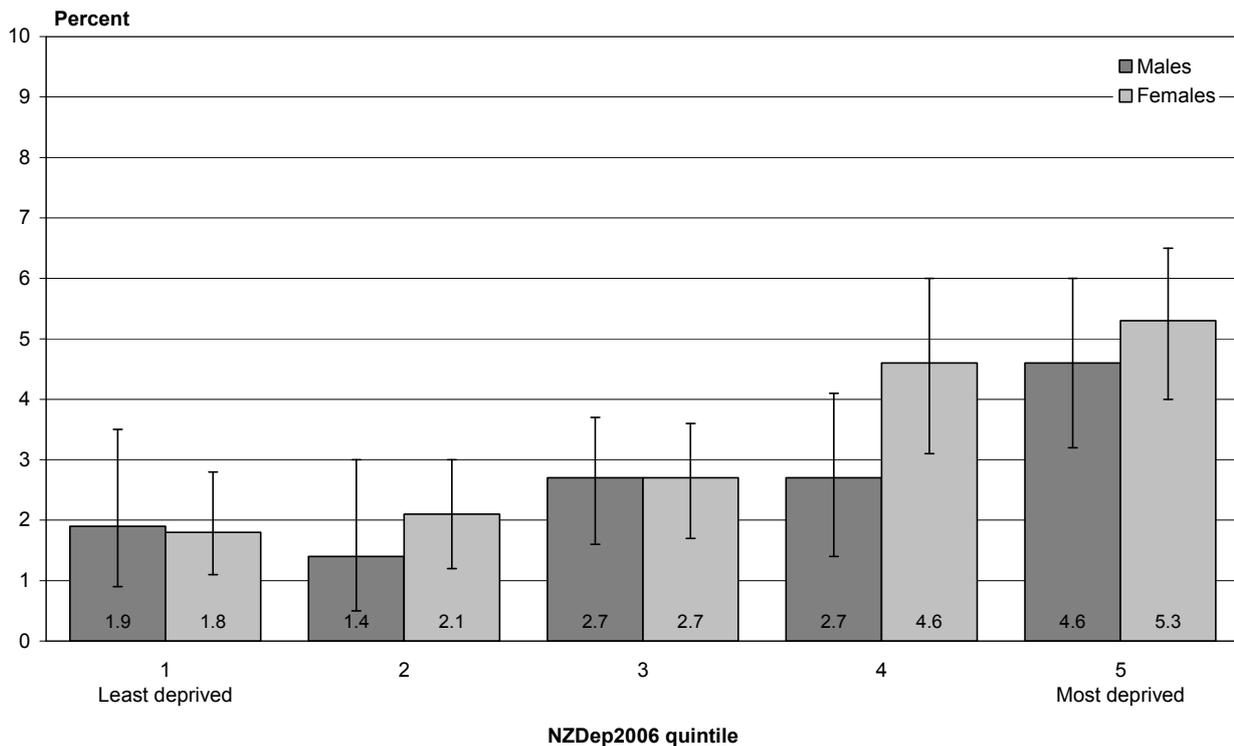
Source: 2006/07 New Zealand Health Survey

By urban/rural classification

When adjusting for age, there were no significant differences in experiencing problems due to someone's gambling in the last 12 months by urban/rural classification (Figure 35).

Figure 35: Experienced problems due to someone's gambling in the last 12 months, by urban classification (age-standardised prevalence)
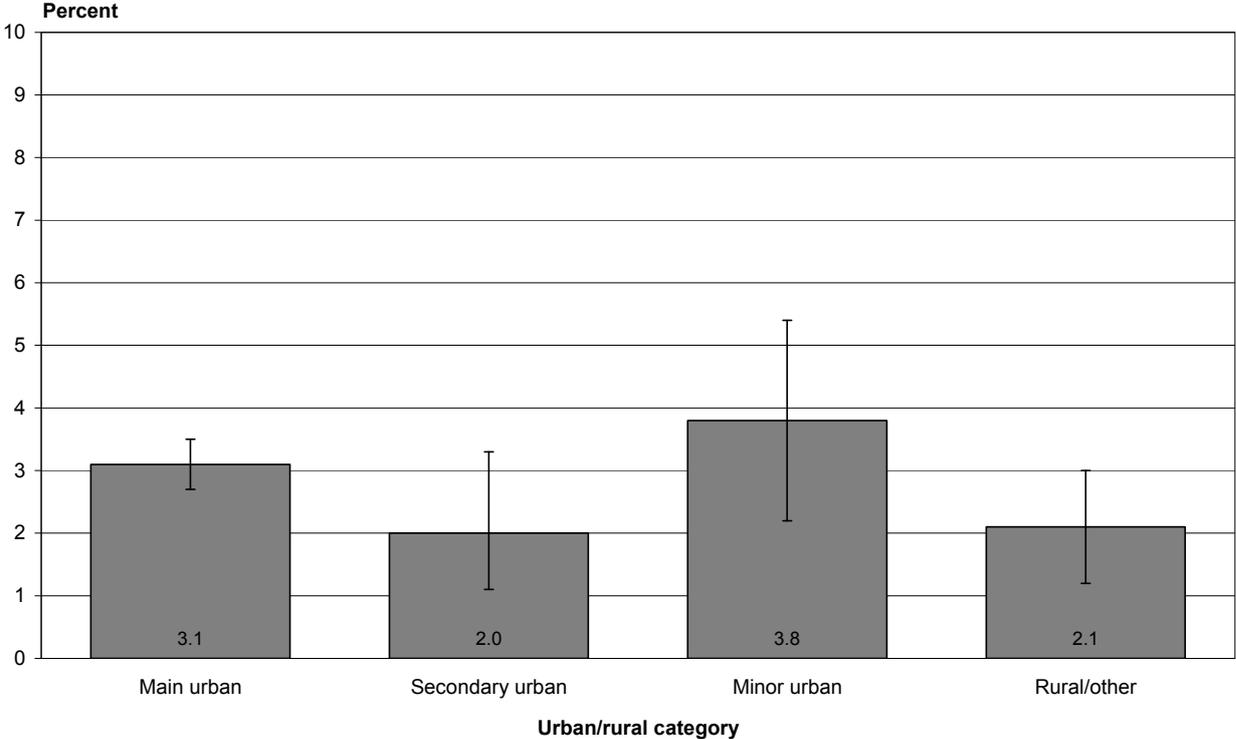
Source: 2006/07 New Zealand Health Survey

Chapter 7: Discussion and Conclusion

Discussion

Overall results

This study estimated that severe gambling problems are being experienced by approximately 13,100 gamblers in the general New Zealand population, with a further 40,900 people gambling at levels that may or may not be leading to negative consequences (moderate-risk gambling). Furthermore, 87,000 adults reported experiencing problems from someone's gambling in the last 12 months, the majority of whom (65,300 adults) were classified as either non-gamblers or recreational gamblers, and were therefore unlikely to be experiencing problems from their own gambling.

There were distinct trends in gambling and experiencing gambling-related harm, with some population groups being disproportionately more affected by gambling-related harm.

Gender

Males and females had similar levels of problem gambling (the more severe form of gambling problems), although males were significantly more likely to be moderate-risk gamblers. This suggested that males experienced a higher overall prevalence of gambling problems when using a broader definition of gambling problems to include people with either severe or moderate gambling problems.

Age group

This study found that people aged 35–44 years (and particularly males in this age group) had the highest prevalence of problem gambling. Being in this age group remained a key risk factor for problem gambling even after controlling for other risk factors.

There has been general concern about youth gambling, with some studies conducted overseas finding that the prevalence of gambling problems among youth to be at least as high as that for adults in the population. In New Zealand the Gambling Act 2003 tightened the age restrictions on some forms of gambling, and there is now an age limit of 18 years for Instant Kiwi, non-casino gaming machines and track betting, and an age limit of 20 years for casino gambling. A finding from this study was that one in six people aged 15–17 years had played Instant Kiwi in the last year, despite the Gambling Act 2003 raising the legal age for purchasing Instant Kiwi from 16 to 18 in 2004.

Participation by youth in other forms of gambling was low, potentially due to age restrictions on access to venues (such as casinos) or credit cards (for Internet gambling). It should be noted that this survey did not measure participation in informal forms of gambling (such as card games with friends), which may be participated in by this age group. Overall, the prevalence of problem gambling was low in this age group, with 0.4% of people aged 15–17 years being problem or moderate-risk gamblers, compared to 1.7% of the total adult population.

This study showed that there was low gambling participation among older people aged 65 years and over. Similarly, the prevalence of problem and moderate-risk gambling was low in this age group, at 0.8%. Older people were also less likely to have experienced problems due to someone's gambling in the last 12 months compared to people in other age groups.

Ethnic group

Similar to previous New Zealand studies (Abbott and Volberg 1991, 2000; Ministry of Health 2006a), this study found that Māori and Pacific people were disproportionately affected by gambling-related harm in New Zealand, both from their own gambling and from other people's gambling.

Māori had a higher gambling participation rate than the national average, and also had a significantly higher risk of being problem or moderate-risk gamblers. Although comprising only 11.4% of the adult population, Māori made up approximately half of problem gamblers and approximately one-third of all problem and moderate-risk gamblers. Furthermore, Māori made up 28.6% of people seeking help at problem gambling face-to-face intervention services in 2007 (Ministry of Health 2008b), which suggested a possible under-utilisation of intervention services among this population group. Even when controlling for key demographic and socioeconomic variables, Māori still had over five times the risk of being a problem gambler compared to people who were not of Māori or Pacific ethnicity. Māori were also significantly more likely to have experienced problems due to someone's gambling in the last 12 months, compared to people in the total population.

There was a different pattern of gambling problems among Pacific people. As found in previous studies, Pacific peoples had a lower level of gambling participation than other ethnic groups, with just over half of Pacific adults having gambled in the last year, compared to approximately 65% in the total population. However, the burden of problem gambling on the Pacific community was still large. Despite being less likely to gamble overall, Pacific people had five times the odds of being problem gamblers than people who were not of Māori or Pacific ethnicity, after controlling for key demographic and socioeconomic variables. These findings support a bimodal gambling pattern of experiencing low rates of gambling participation but high rates of gambling problems, similar to findings from previous studies (Abbott and Volberg 2000; Ministry of Health 2006a). Pacific people made up 21.1% of problem gamblers and 16.2% of all problem and moderate-risk gamblers, while only comprising 5.3% of the total adult population. However, Pacific people only made up 7.2% of new clients to face-to-face intervention services in 2007, suggesting that they were likely to be under-presenting at intervention services (Ministry of Health 2008b). Furthermore, one in 13 Pacific adults reported experiencing problems due to someone's gambling in the last 12 months, a significantly higher rate than in the total population.

Among Asians, gambling participation was low, with less than half of Asians having gambled in the last 12 months. Similarly, there were low participation rates for the majority of gambling activities compared to the national rate when adjusting for age, including lower rates compared to the total population for non-casino gaming machines and track betting, and similar (for Asian males) or lower (for Asian females) levels of participation in casino table games, compared to the total male and female population. The prevalence of problem gambling was also low among Asians, although the prevalence of problem and moderate-risk gambling was similar to that among Europeans/Others. The prevalence of having experienced problems due to someone's gambling was similar to that among European/Others, after adjusting for age.

Socioeconomic factors

The proportion of people who had gambled in the past year was very similar across neighbourhood socioeconomic deprivation (NZDep2006) quintiles. However, past-year participation in non-casino gaming machines was significantly higher in more deprived neighbourhoods. This may reflect the increased availability of these types of gambling venues in more deprived neighbourhoods (Ministry of Health 2006b).

Furthermore, there was a strong gradient of gambling problems with increasing neighbourhood socioeconomic deprivation. People living in more deprived (NZDep2006 quintile 5) areas were significantly more likely than all other people to have gambling problems, when adjusting for age. Deprivation was also found to be a risk factor when controlling for potential confounding variables. This differed from 2002/03, when analyses suggested that neighbourhood socioeconomic deprivation was not a significant risk factor for problem gambling when controlling for other factors such as ethnicity.

The differences in these findings could be explained in a number of ways, including the change of the problem gambling screen to the CPGI, which measures different aspects of gambling, including social and context risk factors, as well as negative effects. This study also found that there was a significantly higher prevalence of experiencing problems due to someone's gambling in more deprived neighbourhoods, after adjusting for age, suggesting that the burden of gambling-related harm is greater in these neighbourhoods of higher socioeconomic deprivation.

There are a number of possible explanations for the associations between gambling problems and living in areas of higher socioeconomic deprivation. People in more socioeconomically deprived neighbourhoods have less disposable income, and therefore may feel the negative effects from excessive gambling more easily. Alternatively, gambling accessibility may have contributed to the inequalities of gambling-related harm by socioeconomic deprivation. Studies have shown that gambling venues, including non-casino gaming machine venues and TABs, are more likely to be located in more deprived areas (Ministry of Health 2006b), which increases access to gambling venues. A recent study has also shown that living closer to gambling venues is associated with increased risk of problem gambling (Ministry of Health 2008d).

More generally, regression analysis also found that people with fewer formal qualifications were significantly more likely to be problem gamblers, while household size and work status were not significantly associated with problem gambling status.

Comparisons

The results from this survey suggest that there has been a decrease in overall gambling participation since the 2002/03 New Zealand Health Survey. There were also significant declines in past-year participation in particular forms of gambling, particularly non-casino gaming machines and track betting. Past-year participation in casino gambling had remained relatively stable since 2002/03. There were very low participation rates in internet gambling in both 2002/03 and 2006/07, despite past concerns that participation in this form of gambling would increase over time. These decreases in gambling participation are supported by other gambling statistics that show a decrease, between 2003/2004 and 2007, in the number of non-casino gaming machines, expenditure on gambling, and the number of people seeking help for gambling problems.

Comparisons of the prevalence of problem gambling showed that other jurisdictions generally have a low prevalence of problem gambling according to the CPGI (between 0.4% and 0.9%), similar to that found in New Zealand. However, these comparisons must be interpreted with caution because the studies have not necessarily used comparable methodologies and population age groups.

It was not methodologically possible to compare the prevalence of problem gambling in New Zealand from this study with previous studies due to differences in methodologies and problem gambling screens. However, despite the differences in screens, there have been some persistent inequalities noted in the risk factor analyses for severe gambling problems. In particular, Māori and Pacific people have continued to be more at risk of gambling problems since 1991.

Problem gambling and health

This study found associations between problem gambling and both hazardous drinking and current smoking, similar to previous studies in New Zealand and internationally (Ministry of Health 2006a; SERCIS 2001; Toneatto et al 2002; Volberg et al 1999; Welte, Wieczorek, Tidwell et al 2004). Since the 2002/03 New Zealand Health Survey the Smoke-free Environments Amendment Act 2003 has been introduced in New Zealand, which means that it is now illegal to smoke inside any workplace, including at gambling venues. Despite this, there is still a strong correlation between current tobacco smoking and problem gambling status. Further work could investigate whether there are associations between problem gambling status and heavy smoking.

Strong associations were found between problem gambling and worse self-rated health status, including mental health and psychological distress, similar to previous studies (Ministry of Health 2006a; SERCIS 2001; Toneatto et al 2002; Volberg et al 1999; Welte, Wieczorek, Tidwell et al 2004). A large proportion (approximately one in five) of problem and moderate-risk gamblers had a high or very high probability of having psychological distress, according to the K10 screen. While it was not possible to determine the direction of this relationship due to the cross-sectional nature of the survey, the association showed a dose-response relationship, with the prevalence of having a high or very high probability of psychological distress increasing with the severity of gambling problems. Similar to the 2002/03 New Zealand Health Survey, this study also found that people with gambling problems had significantly worse self-rated health on a number of the SF-36 health domains. As shown previously (Ministry of Health 2006a), it has tended to be the domains in the mental health spectrum that showed the largest differences.

Figures from this study also suggest that the majority of people with gambling problems had accessed primary health care in the past 12 months. One in six problem gamblers had seen a psychologist, counsellor or social worker in the past 12 months, and nine in ten had seen a GP in that time. This suggests that problem gamblers are generally seeking medical help, but the reasons for these visits are not clear (although they could include the health outcomes shown above). These results suggest that medical services such as GPs, psychologists and counsellors are a possible point of contact for problem gamblers. Future studies could follow up with people experiencing gambling problems to determine whether or not they had ever sought help for their gambling problems, and if not, any barriers to seeking help. This would enable services to better understand who seeks help and why, and may help eliminate barriers to other people seeking help.

Strengths and limitations of this study

There were many advantages to including a problem gambling prevalence screen in the 2006/07 New Zealand Health Survey. This survey had a robust methodology, with over 12,000 adult respondents throughout New Zealand (including increased numbers of Māori, Pacific and Asian people) and a response rate of 68%. This study used an area-based sampling frame with face-to-face interviews, which may have better coverage of the population than telephone interviewing.

The survey questionnaire collected a wide range of information about health behaviours, health status and socio-demographics. The inclusion of the nine-question Canadian Problem Gambling Index (CPGI) gave a robust measure of the continuum of problem gambling risk and harm, for all respondents who had gambled in the past year. Using the CPGI represents a move away from the SOGS (included in the 1991 and 1999 National Prevalence Surveys) and the screen used in the 2002/03 New Zealand Health Survey. Although using the CPGI has meant that there has not been able to be any time trend analysis since 1999, its inclusion in upcoming New Zealand health surveys will allow comparisons over time, and will ensure that the prevalence of problem gambling in the New Zealand adult population is monitored on a regular basis, using a reasonably consistent methodology.

The CPGI has not been validated in the New Zealand population, although it was validated in the Canadian adult population (aged 18 years and over) as part of its development. It is noted that the CPGI registered a very low prevalence of problem gambling among some population groups, specifically Asians, European/Others, and in the least deprived areas (NZDep2006 quintile 1). However, when looking at problem and moderate-risk gamblers combined, the prevalence in these groups increased considerably. This may be a result of the types of questions asked in the CPGI, which concentrate on the negative effects of gambling. In some ethnic groups there may have been translation issues, which could have led to under-reporting. Future work could examine and/or validate the use of the CPGI in New Zealand population groups.

Limitations of this study included the general limitations of measuring the prevalence of problem gambling in the population, such as relying on self-reported information to sensitive questions about gambling behaviour. These responses may be affected by social desirability bias; for example, heavy gamblers may be in denial or may wish to conceal their gambling from other people. Asking respondents about their gambling behaviour over the last 12 months may also lead to recall bias (such as under- or over-reporting).

The target population for the 2006/07 New Zealand Health Survey was the usually resident population living in permanent private dwellings in New Zealand. It should be noted that the results of this study may not necessarily apply to the total New Zealand population, if people not included in the survey (such as people in prisons, hospitals and homeless people) had different gambling patterns to the rest of the population. For example, previous studies have suggested that the prevalence of problem gambling is high in recently sentenced prison inmates (Abbott and McKenna 2000; Abbott et al 2000).

The inclusion of the CPGI in a national health survey was likely to have minimised non-response due to gambling status, as people were less likely to opt out of a general health survey than a gambling survey due to their gambling behaviour. There was also a very low rate of item non-response for the CPGI screen. Further, there were limitations in the analysis that could be included in this report due to the small number of gambling-related questions included in the health survey.

One of the more general limitations of cross-sectional surveys is that they cannot be used to determine causality, since all the information was collected at one point in time. This means that it is not possible to determine whether the associations between problem gambling and, for example psychological distress, are caused by the problem gambling, or by the psychological distress. This could be explored in future prospective studies.

Key results

There were several key results from this study.

1. Māori and Pacific people experience more gambling-related harm

This study showed that inequalities exist in gambling-related harm. In particular, there still appears to be a persistent burden on the Māori and Pacific communities. This burden takes the form of not only a higher prevalence of problem gambling, but also a higher prevalence of experiencing problems due to someone's gambling. Evidence also suggests that some population groups, in particular Pacific and possibly Māori, are under-represented at face-to-face intervention services.

The types of harms that may be experienced due to problem gambling include financial and health problems, which suggests that problem gambling may perpetuate existing inequalities. It is therefore important that these disparities in the prevalence of gambling-related harm are addressed. Furthermore, the results from this study showed that there were strong associations between problem gambling and both hazardous drinking and current smoking, which are health behaviours where Māori and Pacific people also tend to experience a higher burden (Ministry of Health 2008a).

2. People living in more deprived areas are more affected by problem gambling

Another population group to experience inequalities from gambling-related harm are people living in more socioeconomically deprived neighbourhoods (according to the New Zealand Index of Deprivation 2006). This study showed that people living in more deprived neighbourhoods were significantly more likely to have gambling problems compared to other people, even when controlling for other factors such as age, education status and ethnic group. Overall, an estimated 80% of problem gamblers lived in the 40% most deprived areas in New Zealand. Furthermore, people in more deprived areas were significantly more likely to have experienced gambling problems due to someone's gambling.

3. Implications for provision of services for people with gambling problems

There are several implications from this study for the provision of services to people with gambling problems. For example, this study showed that problem gambling was not limited to the main urban areas, but also affected people in smaller towns and rural areas. This has implications for problem gambling intervention service provision, because it is important to ensure that people can access services regardless of where they live. This study also suggested that Māori and Pacific people may be under-represented at problem gambling intervention services. This highlights the importance of examining barriers to help-seeking, as well as possible ways of ensuring accessibility to intervention services irrespective of where people live.

It also appears that problem gamblers were likely to be experiencing other health-related problems, such as hazardous drinking and mental health issues. Analyses showed that problem gamblers had high usage of primary health care, with over nine in ten problem gamblers having seen a GP in the last 12 months. This suggests that the GP setting could be a useful intervention point for referring people on to more specialist services. However, problem gamblers were also significantly more likely to have unmet need to see a GP due to cost in the past year, suggesting that financial concerns were limiting their ability to seek health care. The findings from this study support problem gambling intervention services working alongside existing counselling services for financial problems, alcohol and drug problems and mental health issues, in order to fully meet the needs of people experiencing gambling-related harm.

Conclusion

Overall, the results of this study showed that problem gambling continues to be a social and health issue in New Zealand. One in 58 adults were either problem or moderate-risk gamblers in New Zealand, representing 54,000 people with gambling problems. Furthermore, an estimated 87,000 adults had experienced problems due to someone's gambling in the last 12 months. Although these numbers are relatively small compared to the estimated number of adults with hazardous drinking behaviour (551,300 adults) or who are current smokers (619,900 adults) (Ministry of Health 2008a), this study has shown that there is still a burden of gambling-related harm in the New Zealand community.

This report has also shown that gambling-related harm does not affect everyone in this country equally. The evidence suggests that gambling-related harm is disproportionately affecting Māori, Pacific people and people living in areas of higher socioeconomic deprivation. These inequalities are found not only for people experiencing gambling problems themselves, but also for the people experiencing problems due to someone's gambling, which may include family, whānau and the wider community. Given that the effects of problem gambling include financial and health problems, it would appear that gambling problems may perpetuate existing inequalities. It is therefore important to address gambling-related harm, and in particular these existing inequalities.

Glossary

95% confidence interval An indicator of the accuracy of a survey estimate. The 95% confidence interval (95% CI) is the interval that would be expected to contain the true population value 95% of the time, if many samples were taken. In this report, 95% confidence intervals have been presented in parentheses after estimates in the text, and as error bars in graphs.

Age-standardised rates Rates that have been adjusted to take account of differences in the age distribution between different groups (eg, different ethnic groups). The standard population used in this report is the World Health Organization world population (Ahmad et al 2000).

CPGI Canadian Problem Gambling Index (Ferris and Wynne 2001). The problem gambling screen from this questionnaire consists of nine questions, which is also called the Problem Gambling Severity Index (PGSI).

NCGM Non-casino gaming machine: electronic gaming machines (also known as 'pokies' in New Zealand) located in non-casino premises (ie, pubs, clubs and bars).

NZDep2006 New Zealand Index of Socioeconomic Deprivation 2006, an area-level (meshblock) measure of the socioeconomic status of an area.

Odds ratio The odds of an outcome in one category compared to a reference category.

PGSI Problem Gambling Severity Index, the nine-question problem gambling screen included as part of the Canadian Problem Gambling Index.

Prevalence The number of cases in a population, often presented as a percentage or proportion.

Prioritised ethnic groups When using prioritised ethnic groups, each person is allocated to one ethnic group, based on the ethnic groups they identified with, in the prioritised order of: Māori, Pacific, Asian, European/Other. Prioritised ethnic groups have been used for some analyses in this report.

Rate The prevalence of an indicator within a defined population (eg, Māori) and a defined time period (2006/07).

Rate ratio How prevalent an indicator is in one population group (eg, Māori) compared to another (eg, the total New Zealand population).

Standardised rate ratio The ratio of two age-standardised rates (eg, Māori males vs males in the total population). The reference groups used in this report are the males and females in the total population (ie, the national age-standardised rate for each gender). A standardised rate ratio is said to indicate a statistically significant difference between the group of interest and the reference group when the confidence interval does not include the value 1.

Total response ethnicity A categorisation of ethnicity whereby each person is assigned to all those ethnicities they identify with. Total response ethnicity has been used in this publication.

Unadjusted prevalence A rate that has not been age standardised. This is an unadjusted (or 'crude') rate that can be used to estimate the number of people affected in a population.

Appendix: Additional Data Tables

Number of gambling activities, by past-year gambling participation

Table A1 presents the number of gambling activities participated in during the last 12 months, by past-year gambling participation group. These results show that almost half of all Lotto players (45.0%, 43.4–46.5) had played only one activity (Lotto) in the past 12 months. By contrast, one in three past-year NCGM players (35.8%, 32.3–39.3) had played four or more gambling activities in the past 12 months.

Table A1: Number of gambling activities participated in during the last 12 months, by past-year gambling participation group (unadjusted prevalence)

Population group	Prevalence (%) for total adults (95% CI)			
	Gambled on one activity in last 12 months	Gambled on two activities in last 12 months	Gambled on three activities in last 12 months	Gambled on four or more activities in last 12 months
Among all past-year gamblers	49.6 (48.2–51.1)	30.3 (29.0–31.6)	12.6 (11.8–13.3)	7.5 (6.8–8.3)
Among past-year Lotto players	45.0 (43.4–46.5)	32.4 (31.0–33.9)	14.1 (13.1–15.0)	8.5 (7.7–9.4)
Among past-year Instant Kiwi players	15.4 (13.6–17.1)	46.6 (44.5–48.7)	22.4 (20.8–24.1)	15.6 (14.1–17.1)
Among past-year NCGM players	10.6 (8.3–12.9)	21.8 (18.8–24.8)	31.7 (28.5–34.9)	35.8 (32.3–39.3)
Among past-year horse or dog racing gamblers	10.9 (8.6–13.1)	31.6 (27.6–35.5)	27.9 (24.6–31.1)	29.7 (25.6–33.9)
Among past-year casino gaming machines players	7.6 (5.4–9.9)	23.3 (19.7–26.9)	29.0 (25.5–32.6)	40.0 (35.4–44.7)
Among past-year sports betting gamblers	7.3 (4.5–10.1)	25.0 (20.3–29.7)	28.8 (24.3–33.4)	38.9 (33.4–44.4)
Among past-year casino table games players	5.6 (2.7–10.0)	21.0 (14.5–27.6)	21.8 (14.8–28.8)	51.6 (43.8–59.5)
Among past-year Keno players	6.4 (3.0–11.7)	13.8 (8.9–18.6)	32.6 (26.0–39.2)	47.2 (39.2–55.2)
Among past-year housie players	16.1 (10.9–21.3)	27.3 (20.6–34.0)	26.6 (18.5–34.7)	30.0 (22.8–37.2)
Among past-year internet gamblers	6.0 (0.5–22.4)	21.9 (6.7–46.1)	13.4 (5.3–26.2)	58.7 (37.3–78.0)

Source: 2006/07 New Zealand Health Survey

Changes in gambling participation since 2002/03

The following data tables present the past-year gambling participation for 2002/03 and 2006/07. These results are presented for the following populations: people aged 15 years and over, people aged 18 years and over, and people aged 20 years and over. Table A2 presents the unadjusted estimates, and Table A3 presents the age-standardised estimates.

Table A2: Past-year participation in specific types of gambling activities, 2002/03 and 2006/07 (unadjusted prevalence)

Gambling activity	Prevalence (%) for adults aged 15 years and over (95% CI)		Prevalence (%) for adults aged 18 years and over (95% CI)		Prevalence (%) for adults aged 20 years and over (95% CI)	
	2002/03	**2006/07**	**2002/03**	**2006/07**	**2002/03**	**2006/07**
Any gambling activity	69.4 (68.2–70.6)	65.3 (64.2–66.5)	70.4 (69.2–71.7)	68.1 (66.9–69.2)	71.1 (69.8–72.3)	68.7 (67.6–69.8)
Lotto	58.7 (57.5–60.0)	55.2 (54.0–56.4)	60.8 (59.6–62.1)	58.6 (57.4–59.8)	62.4 (61.1–63.7)	59.7 (58.4–60.9)
Instant Kiwi	29.2 (27.8–30.6)	26.5 (25.5–27.6)	29.0 (27.6–30.5)	27.2 (26.0–28.3)	28.8 (27.4–30.2)	26.9 (25.8–28.1)
Non-casino gaming machines	12.8 (12.0–13.6)	10.2 (9.5–10.9)	13.0 (12.2–13.8)	10.8 (10.0–11.5)	12.8 (11.9–13.6)	10.5 (9.8–11.3)
Casino gambling (tables or gaming machines)	8.3 (7.5–9.2)	8.8 (8.1–9.5)	8.7 (7.8–9.5)	9.3 (8.6–10.1)	8.9 (8.0–9.8)	9.4 (8.7–10.2)
Track betting	11.3 (10.5–12.1)	8.7 (7.9–9.4)	11.6 (10.7–12.4)	9.0 (8.3–9.8)	11.7 (10.8–12.5)	9.2 (8.4–10.0)
Sports betting	4.2 (3.7–4.7)	5.2 (4.7–5.7)	4.3 (3.8–4.8)	5.5 (5.0–6.0)	4.3 (3.8–4.8)	5.5 (5.0–6.0)
Keno / Daily Keno	2.1 (1.8–2.5)	1.6 (1.3–1.8)	2.2 (1.8–2.5)	1.6 (1.4–1.9)	2.2 (1.9–2.6)	1.7 (1.4–1.9)
Housie	1.9 (1.6–2.1)	1.5 (1.3–1.8)	1.8 (1.6–2.1)	1.5 (1.3–1.8)	1.9 (1.6–2.2)	1.5 (1.3–1.8)
Internet-based gambling	0.7 (0.5–1.0)	0.4 (0.3–0.5)	0.6 (0.4–0.9)	0.4 (0.3–0.6)	0.5 (0.3–0.8)	0.4 (0.3–0.6)
Lotto only	25.2 (24.1–26.2)	24.8 (23.8–25.8)	26.2 (25.1–27.3)	26.3 (25.3–27.4)	27.1 (26.0–28.2)	27.1 (26.0–28.2)
Any non-Lotto activity	44.2 (42.9–45.5)	40.5 (39.3–41.6)	44.2 (42.8–45.6)	41.7 (40.5–42.9)	44.0 (42.6–45.4)	41.5 (40.4–42.7)

Sources: 2002/03 and 2006/07 New Zealand Health Surveys

Table A3: Past-year participation in specific types of gambling activities, 2002/03 and 2006/07 (age-standardised prevalence)

Gambling activity	Prevalence (%) for adults aged 15 years and over (95% CI)		Prevalence (%) for adults aged 18 years and over (95% CI)		Prevalence (%) for adults aged 20 years and over (95% CI)	
	2002/03	2006/07	2002/03	2006/07	2002/03	2006/07
Any gambling activity	69.4 (68.1–70.8)	64.8 (63.6–66.0)	70.8 (69.4–72.1)	68.2 (67.0–69.3)	71.6 (70.2–72.9)	68.9 (67.8–70.1)
Lotto	57.3 (55.9–58.7)	53.5 (52.3–54.7)	60.0 (58.7–61.4)	57.6 (56.4–58.8)	62.0 (60.5–63.4)	58.9 (57.6–60.1)
Instant Kiwi	30.9 (29.4–32.4)	27.6 (26.5–28.8)	30.6 (29.0–32.3)	28.5 (27.3–29.7)	30.4 (28.8–31.9)	28.3 (27.0–29.5)
Non-casino gaming machines	13.6 (12.6–14.6)	10.7 (10.0–11.5)	13.9 (12.9–14.9)	11.5 (10.7–12.3)	13.6 (12.6–14.7)	11.2 (10.4–12.1)
Casino gambling (tables or gaming machines)	8.6 (7.7–9.5)	9.2 (8.4–10.0)	9.1 (8.1–10.1)	9.9 (9.1–10.7)	9.4 (8.4–10.4)	10.0 (9.2–10.9)
Track betting	11.4 (10.6–12.3)	8.6 (7.8–9.3)	11.8 (10.9–12.7)	9.0 (8.2–9.8)	11.9 (11.0–12.8)	9.2 (8.4–10.1)
Sports betting	4.6 (4.0–5.2)	5.4 (4.9–5.9)	4.8 (4.2–5.4)	5.8 (5.2–6.3)	4.8 (4.2–5.4)	5.8 (5.2–6.3)
Keno / Daily Keno	2.1 (1.8–2.4)	1.6 (1.3–1.8)	2.1 (1.8–2.5)	1.6 (1.4–1.9)	2.3 (1.9–2.6)	1.7 (1.4–2.0)
Housie	1.8 (1.5–2.1)	1.5 (1.2–1.8)	1.8 (1.5–2.1)	1.5 (1.2–1.8)	1.9 (1.6–2.1)	1.5 (1.2–1.8)
Internet-based gambling	0.7 (0.4–1.0)	0.4 (0.3–0.6)	0.6 (0.3–0.9)	0.5 (0.3–0.7)	0.5 (0.2–0.8)	0.5 (0.3–0.7)
Lotto only	23.5 (22.5–24.5)	23.2 (22.3–24.2)	24.8 (23.7–25.9)	25.0 (24.0–26.0)	25.9 (24.8–27.1)	25.9 (24.9–27.0)
Any non-Lotto activity	45.9 (44.5–47.4)	41.5 (40.3–42.7)	45.9 (44.4–47.5)	43.1 (41.8–44.4)	45.6 (44.1–47.1)	43.0 (41.7–44.2)

Sources: 2002/03 and 2006/07 New Zealand Health Surveys

International comparisons of problem gambling prevalence

In international studies that have used the Canadian Problem Gambling Index the prevalence of problem gambling was generally less than 1.0% of the population (Table A4). New Zealand had broadly comparable levels of problem gambling, moderate-risk gambling and low-risk gambling to other countries and jurisdictions.

These comparisons should be interpreted with caution, however, given the different survey design methodologies and different age groups of respondents. Furthermore, these results are the unadjusted estimates; that is, they have not been adjusted for the varying age structures of the different populations. Finally, some studies did not provide 95% confidence intervals for the prevalence estimates.

Table A4: Comparison of prevalence of problem gambling according to Canadian Problem Gambling Index (CPGI) in selected international studies (unadjusted prevalence)

Jurisdiction	Year	Age group (years)	Sample size	Prevalence (%) in total population (95% CI)		
				Problem gambling	Moderate-risk gambling	Low-risk gambling
British Columbia, Canada (Ministry of Public Safety and Solicitor General 2003)	2002	18+	2,500	0.4	4.2	11.1
Prince Edward Island, Canada (Doiron 2006)	2005	18+	1,000	0.9 (0.3–1.5)	0.7 (0.2–1.2)	1.2 (0.5–1.9)
United Kingdom (Wardle et al 2007)	2007	16+	9,003	0.5 (0.4–0.8)	*	*
Queensland, Australia (Queensland Treasury 2008)	2006/07	18+	30,000	0.5 (0.3–0.6)	1.8 (1.5–2.2)	5.7 (4.7–6.7)
New South Wales, Australia (AC Nielsen 2007)	2005	18+	5,029	0.8	1.6	2.1
South Australia, Australia (South Australian Department of Health 2006)	2005	18+	17,745	0.4 (0.3–0.5)	1.2 (1.1–1.4)	2.3 (2.1–2.6)
New Zealand	2006/07	15+	12,488	0.4 (0.3–0.5)	1.3 (1.1–1.5)	3.5 (3.1–3.9)
New Zealand	2006/07	18+	11,922	0.4 (0.3–0.6)	1.4 (1.2–1.6)	3.6 (3.2–4.0)

Note: Some studies did not provide 95% confidence intervals. References are given in parentheses after the name of the jurisdiction. The results from this current study are highlighted in grey.

* Estimates not provided.

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