



**AUT GAMBLING & ADDICTIONS
RESEARCH CENTRE**

AUT

**GAMBLING BEHAVIOURS AND ASSOCIATED RISK
FACTORS FOR 17 YEAR OLD PACIFIC YOUTH**

FINAL REPORT

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EXECUTIVE SUMMARY

This summary is written in an informal style, providing an overview of the research for the general public. The rest of the report is written using an academic style that provides detailed methods, results and discussion of the research.

Background and purpose

Pacific people have a high risk for developing harmful gambling behaviours

National surveys have consistently found that, overall, Pacific adults are less likely to participate in gambling activities than European adults (74.5% of Pacific people gambled in 2012 vs. 81.4% of Europeans)², but that those who do gamble have a higher risk of developing levels of harmful gambling (8.0% of Pacific people are moderate-risk/problem gamblers vs. 1.7% of Europeans)³ and have a higher gambling expenditure (mean of \$102.31 per month vs. \$65.91 for Europeans)². The reasons for the increased risk are not well understood and the gambling behaviours of Pacific youth, which could lead to adult gambling behaviours, are even less researched.

Surveys were conducted with the 17 year old youth in the longitudinal Pacific Islands Families study

A birth cohort of 1,398 Pacific infants was recruited into the Pacific Islands Families (PIF) study from a South Auckland hospital in 2000. In 2017, the cohort children were 17 years old and an extensive set of gambling-related questions was included in their survey. Six hundred and thirty-two youth were surveyed.

The purpose of the study was to understand gambling behaviours of 17 year old Pacific youth and how this has changed from when they were aged 14 or 9 years

The five study aims were to:

- 1) Assess the extent of gambling and problem gambling amongst 17 year old Pacific youth and to identify gender or ethnic differences, as well as to assess co-existence with social, health and environmental factors.
- 2) To assess help-seeking behaviours.
- 3) To examine changes in gambling behaviours and problem gambling over time, from age 9 years and 14 years (where possible) to 17 years.
- 4) To assess for possible risk and protective factors for gambling and problem gambling.
- 5) To assess gambling behaviours of parents/caregivers and any negative effects.

² National Gambling Study: Abbott et al., 2014a

³ National Gambling Study: Abbott et al., 2014b

Results

The study found that...

Almost one-third of youth had gambled for money in the prior year, and boys had different preferences from girls

Almost one in three youth (31.7%) had gambled for money in the prior year, an increase from one in five when the youth were 14 years old. The early teenage gambling behaviours continued into the late teen years with the three most common activities consistently being bets with friends or family, betting on sports matches and betting on card games. On average, each gambler participated in two different gambling activities.

Compared to girls, boys generally preferred activities with some element of skill such as gambling on games of marbles and on sports matches, whilst girls were more likely to bet on games of chance such as housie/bingo and Lotto. Contrarily, however, boys also preferred betting on games of dice, despite the outcomes of dice games being completely by chance. No major ethnic-specific differences were noted.

Gambling was an infrequent activity though dice gambling and playing games for money on a mobile phone or tablet occurred at a higher intensity

Gambling was generally an infrequent activity, occurring less than monthly for more than half of the youth gamblers for almost all activities. This was similar to when the youth were 14 years old. Although almost two in three (62.2%) youth gamblers reported not usually spending any time each day gambling, about one in three (37.8%) gambled daily and one in 83 (1.2%) gambled for more than three hours per day.

Of the youth who gambled on dice or who played games for money on a mobile phone or tablet, compared with youth who gambled on other activities, a higher percentage gambled at least monthly with about one-third gambling at least weekly. However, these two gambling activities were only participated in by about one in ten gamblers.

Youth who gambled on dice and housie/bingo were more likely to gamble larger amounts of money per week with one in ten betting \$50 or more per week on these activities. No youth reported spending \$50 or more per week on games for money on a mobile phone or tablet.

For all gambling activities apart from Lotto, the usual weekly expenditure by a majority of youth was less than \$10. For Lotto, one in two youth gamblers (53.7%) reported spending \$10 to \$49 weekly.

Examination of the frequency of gambling on the different activities by gender and ethnicity was not possible due to the very small sample sizes.

Most gambling took place with family and friends

Gambling by 17 year old youth was a social activity with most occurring with family (49.2%) or friends (47.7%). This was similar to when they were 14 years old. One in 14 youth (7.3%) gambled with other people they knew, one in 19 gambled alone (5.2%), and one in 200 (0.5%) gambled with strangers (e.g. online). Boys were more likely to gamble with friends whilst girls were more likely to gamble with family. No major ethnic-specific differences were noted.

Most youth gambled for fun and many gambled to win money or for a challenge

A majority of the youth gambled to have fun (71.5%), and a substantial minority gambled to win money (40.4%) or for a challenge (24.9%). One in seven youth (15%) gambled because of boredom and one in 32 (3.1%) gambled because they were short of money. One in 100 youth (1%) gambled because they could not stop. These findings were similar to when the youth were 14 years old. One in 30 boys (3.3%) but no girls, gambled because their friends gamble. No major ethnic-specific differences were noted.

One in 40 boys were problem gamblers compared with one in 167 girls

Overall, one in 62 youth (1.6%) scored as problem gamblers, similar to the prevalence at age 14 years. However, one in 40 boys (2.5%) were problem gamblers compared with one in 167 girls (0.6%). One in five gamblers had stolen money to gamble. There were no obvious ethnic-specific differences.

Seeking help for gambling was mainly from friends and less usually from adults

About two-thirds (65.3%) of youth gamblers sought help from any one source for their gambling in the prior year, with about one in eleven seeking help from multiple sources. The single most common source of help was friends (25.4%). Seeking help from adults was reported by less than 10% of the youth gamblers for each of school guidance counsellor, teachers, parents and other family members. There were no major gender or ethnic-specific differences.

Buying and receiving Instant Kiwi tickets occurred despite being illegal

One in 31 of all 17 year old youth (3.2%), and one in nine youth gamblers (10.6%), played for money on Instant Kiwi in the prior year, despite Instant Kiwi having an age restriction of 18 years. One in 43 of all youth (2.3%) and one in 20 of the youth gamblers (4.9%) had received Instant Kiwi ticket/s as a gift in the prior year. When the youth were 14 years old, one in 14 (7%) reported ever having been given an Instant Kiwi or other scratch ticket as a present.

Over time, youth transitioned into or out of problem gambling

Of 12 youth problem gamblers aged 14 years, three remained problem gamblers at 17 years; the other nine became non-problem gamblers. Thus, seven of the 10 youth problem gamblers amongst 17 year old youth had been non-problem gamblers three years earlier.

Gambling was as common as cigarette and marijuana smoking but less common than alcohol consumption

Almost one in three youth (31.7%) had gambled in the prior year, similar to the proportion who had ever smoked cigarettes (37.1%), e-cigarettes (36.5%) and marijuana (29.1%). Ever having consumed alcohol was more common with almost three-quarters (72.6%) reporting this.

Gambling was common in the youths' households, with one in five youth worried about a family member's gambling and one in nine experiencing household problem/s from that gambling

More than half (58.8%) of the youth reported that their parents or caregivers gambled. Lotto was the most common activity. One-fifth of all youth were worried or anxious about the money or time their family members spent gambling, and one in nine (10.7%) experienced at least one household problem from a family member's gambling.

Male gender, attending secondary school, electronic cigarette smoking, gang involvement and family members or friends as gang members were significantly associated with gambling at age 17 years

Some factors were significantly associated with past year gambling. Boys had almost twice the odds for gambling compared with girls; this had not been found when the youth were 14 years old. Youth who were still at school had almost three times the odds for gambling than their counterparts who had left school. Ever having smoked an electronic cigarette was associated with odds of 1.69 for gambling, whilst other substance use including conventional cigarette smoking was not associated. Being involved in a gang was associated with more than twice the odds for gambling compared with not having gang associations; this association had also been apparent when the youth were 14 years old and nine years old. Having family or friends in gangs was associated with odds of 1.74 for youth gambling.

Ethnicity, alcohol consumption, general health and suicidality, amount of time spent online, bullying, having paid employment, parental gambling, household problems because of someone else's gambling, and mother's gambling risk level when the youth were 14 years old were not associated with the youth gambling when aged 17 years.

Conclusion

Gambling participation amongst 17 year old Pacific youth was less than half that of adult Pacific gambling. Whilst about three in four Pacific adults have gambled in the past year, about one in three youth are current gamblers but the gambling is generally a relatively infrequent and social activity. Gambling is one of several risky behaviours including alcohol consumption, and smoking cigarettes, e-cigarettes and marijuana. Similar to international youth problem gambling rates, one in 21 youths who gambled were problem gamblers, with a greater percentage of boys than girls. PIF youth gambling is associated with gang involvement and this has been consistently noted from when the children were nine years old. Having family members or friends who were gang members also was associated with youth gambling. Youth gambling occurs in the context of gambling being a common behaviour in families. One in five youth worried about the level of gambling occurring in their household and one in nine youth had experienced at least one household problem from that gambling.

In summary, the common activity of gambling in families together with harmful and risky behaviour by a significant minority of youth, highlights a necessity for relevant and tailored information, education and public health resources to support Pacific families and minimise potential harms from gambling. A preference for seeking help from peers rather than trusted adults such as parents, school guidance counsellors or other family members indicates that public health, prevention and awareness approaches are required to support and empower Pacific youth and peers to provide adequate responses and act as catalysts and supports for behavioural change. The consistent and continued relationship between gang membership and

gambling requires further research to gain an understanding of the implications of this association and potential for future harmful gambling. Although this study has not identified causal relationships, the results, interpreted in conjunction with the findings from when the PIF youth were nine and 14 years old, identify important aspects to be considered for the implementation of policies and practices to minimise the risks for Pacific people and to reduce the development of harmful gambling behaviours.

BACKGROUND

The 2013 census showed that the New Zealand Pacific population is a relatively young, fast growing minority comprising 7.4% of the total population with a median age of 22.1 years, compared with the majority New Zealand European population comprising 74% with a median age of 41.0 years (Statistics New Zealand, 2013). However, Pacific people are a disadvantaged population. For example, compared with New Zealand European people, Pacific people are twice as likely to be on low incomes, twice as likely to be unemployed and nine times more likely to reside in low decile neighbourhoods (Ministry of Business, Innovation and Employment, 2018; Perry, 2017; Tobias, Bhattacharya & White, 2008). These, and other, disadvantages mean that Pacific people have a higher risk for many adverse health and social issues, associated with higher health burden and lower life expectancy (Ministry of Health, 2012).

Pacific people also have a high risk of developing harmful gambling behaviours. Over the past two decades, national surveys have consistently found that whilst Pacific adults are less likely to participate in gambling activities than European adults, those who gamble have a substantially higher risk of developing levels of harmful gambling, and are more likely to have a higher gambling expenditure than European adults (Abbott, 2001a; Abbott, Bellringer, Garrett, & Mundy-McPherson, 2014a, 2014b, 2015, 2016; Abbott, Bellringer, & Garrett, 2018; Abbott & Volberg, 2000; Ministry of Health, 2006, 2009; Rossen, 2015; Thimasarn-Anwar, Squire, Trowland, & Martin, 2017; Tu, 2013).

The Pacific Islands Families (PIF) study aims to determine the pathways that lead to optimal health, development and social outcomes for Pacific people. To date, the study has focused on the main developmental stages of childhood and adolescence, and the influence of family, environment and socio-cultural contexts. It is the only study in New Zealand to specifically follow a birth cohort of Pacific participants over time, and to survey not only the cohort but their parents. This means that interactions with, and influences of, family and the environment on behavioural development and health outcomes can be investigated.

The PIF study recruited 1,398 infants from births at Middlemore Hospital, South Auckland from March to December 2000. Each infant had at least one parent who identified as being of a Pacific ethnicity and who was also a New Zealand permanent resident. Full details regarding study design and methods are described in detail elsewhere (Paterson et al., 2002, 2004, 2006). Data were collected at six weeks, and at one, two, four, six, nine, 11 and 14 years after birth. Surveys with mothers and assessments of children took place in all data collection years. Surveys with fathers occurred when the cohort children were aged one, two, six and 11 years.

In 2006, 2009 and 2014, when the children were aged six, nine and 14 years respectively, the Ministry of Health funded a gambling component in the PIF study. In 2006, gambling data were collected and analysed for the mothers and fathers of the cohort. In 2009 and 2014, gambling data were collected and analysed for the mothers and children. The results from those studies are presented elsewhere (Bellringer, Abbott, Williams & Gao, 2008; Bellringer, Kolandai-Matchett, Taylor & Abbott, 2017; Bellringer, Taylor, Poon, Abbott, & Paterson, 2012; Bellringer, Taylor, Savila & Abbott, 2014).

In 2009, the nine-year old PIF children were only asked a few simple gambling questions due to their young age (i.e. the length was deliberately kept short). Almost all of the children (96%) reported that they had ever participated in card games and 60% reported housie/bingo participation. These activities were usually undertaken with family or friends. Gang involvement and low parental monitoring were associated with higher likelihood of gambling participation, whilst higher cognitive ability (in recognising similar words) was associated with

a slightly lower likelihood of gambling participation (Bellringer et al., 2012). It is worthy of note, however, that aged nine years, only a small proportion of the children had gambled for money (7.7% for card games and 11.2% for housie/bingo), with boys more likely to gamble for money than girls. Seventeen percent of the children had ever been given scratch tickets, and 7% had bought Lotto, Big Wednesday and/or Keno tickets.

In 2014, due to the older age of the PIF children (14 years), the questionnaire was slightly more extensive with questions on gambling motivations and frequency, time spent gambling, gambling expenditure, concerns about gambling, and potential help-seeking behaviours. It also included an adolescent problem gambling screen, the DSM-IV-MR-J (Fisher, 2000). Fifty-four percent of the youth had ever gambled for money on at least one activity, but 58% of these had not gambled in the past year. The most common gambling activities were betting with friends or family (37%), on card games (20%), on sports matches (16%), on marbles and housie/bingo (both 13%), and on board games (12%). Most of the youth reported gambling with family and friends although 12% reported gambling alone. Seven percent of the youth reported that they had ever been given scratch tickets⁴. Being bullied at school, playing computer/video games, watching television/video/DVDs, gang involvement, and having a mother who gambled were associated with a higher likelihood of gambling participation and expenditure. Cook Islands Māori youth were less likely to gamble on continuous⁵ activities than Samoan youth. Of the youth who gambled, 3.7% were problem gamblers and two-thirds of these reported some level of worry about the time or money they spent on gambling (Bellringer et al., 2017).

Similarly, Rossen et al. (2016), from the Youth'12 large cross-sectional study of New Zealand secondary school students (N = 8,500), reported that almost one-quarter (24%) of 13 to 17 year olds had gambled in the past year, and 4.8% had reported two or more indicators of unhealthy gambling. Analogous to the findings in research with adults, Pacific students were disproportionately at risk (Rossen et al., 2016).

In 2017, the PIF youth reached 17 years of age; their final year of age restrictions for gambling on non-casino electronic gaming machines, track and sports betting via a Totalisator Agency Board (TAB) venue, and gambling on scratch cards, as the age restriction for these activities is 18 years⁶. As the PIF youth were scheduled to be re-surveyed in 2017, this provided opportunity for a further extensive gambling component to be included to increase our understanding of Pacific youth gambling and the influences of their socio-cultural environment.

⁴ This was interesting as it was a reduction from the 17% reported by the children five years earlier, suggesting some level of recall bias.

⁵ Continuous gambling is defined as gambling where the outcome between laying the stake and knowing the outcome is rapid and can be repeated within a quick timeframe (e.g. for the 14 year old PIF youth it could be betting on card games, sports matches, marbles and housie/bingo).

⁶ Note that casino gambling has a higher age restriction of 20 years.

RESEARCH METHODS

Ethical approval

Ethical approval for the 2017 phase of the PIF study was granted by the Auckland University of Technology Ethics Committee on 22 February 2017 (Reference 17/26 Pacific Islands Families Study 17-year phase).

Each participant was allocated a code by the research team to ensure confidentiality, and no personal identifying information is reported. At every phase of the study, each participant was informed that their participation was voluntary and that they could withdraw from the study at any time. Participants could also decline to answer any questions with which they felt uncomfortable.

Cultural safety

Throughout the PIF study, the research team has endeavoured to ensure cultural safety, integrity and appropriateness of the research process via the following:

- One of the study's two directors is of Pacific ethnicity.
- The core team comprises Pacific researchers fluent in different Pacific languages.
- There is an advisory board comprising Pacific community and health sector representatives.
- Interviewers are ethnically matched, where possible, to the major Pacific ethnicities of the participants (i.e. Samoan, Tongan and Cook Islands Māori).

Study aims

There were five main objectives to collecting detailed gambling-related data from the youth when they were 17 years old:

- 1) To assess the extent of gambling and problem gambling amongst 17 year old Pacific youth and to identify gender or ethnic differences, as well as to assess co-existence with social, health and environmental factors.
- 2) To assess help-seeking behaviours.
- 3) To examine changes in gambling behaviours and problem gambling over time, from age 9 years and 14 years (where possible) to 17 years.
- 4) To assess for possible risk and protective factors for gambling and problem gambling, where possible.
- 5) To assess gambling behaviours of parents/caregivers and any negative effects.

Research design

Recruitment

All PIF youth were invited to participate in 2017 (including those who had missed participation in one or more previous data collection years), apart from those who were untraceable or who had permanently withdrawn from the study. As in 2014, in the presence of an interviewer, the youth self-administered the questionnaire using tablets.

Data were collected from 22 April 2017 until 8 June 2018⁷ from 632 youth. This compares with 2014 when 931 children were surveyed.

Survey instrument

As the youth were 17 years old, the gambling items in the questionnaire were designed to be similar to those included in the Youth2000 health and wellbeing surveys (as was the case in 2014) as well as recent New Zealand adult national surveys (particularly the National Gambling Study), to allow for comparative analyses. Some gambling questions were included that were also asked of the youth in 2014, so that comparisons could be made over time.

The gambling questions (Appendix 1) covered the following topics:

- 1) Past year gambling participation including frequency and expenditure (to match the National Gambling Study but specifying the range of gambling activities detailed in the 2014 questionnaire).
- 2) Most preferred gambling activity and reason for gambling (as in 2014).
- 3) Time spent gambling each day (to match the National Gambling Study).
- 4) With whom gambling takes place (as in 2014).
- 5) Concerns about gambling including potential and actual help-seeking behaviour (as in 2014 plus additional items).
- 6) Past year receipt of scratch ticket/s as a gift (as in 2014 but in a past year time frame).
- 7) Problem gambling (as in 2014 using the DSM-IV-MR-J).
- 8) Parental and/or caregiver's gambling, concerns about this and negative effects (as in 2014 plus additional items).

The DSM-IV-MR-J screen⁸ developed by Fisher (2000) was designed to assess adolescent problem gambling in general populations. It comprises nine dimensions assessed via 12 items that have different rating scales and response options. Dimensions eight and nine are broken down into sub-questions; for the purpose of scoring, a 'yes' answer to any one of the sub-questions is regarded as a positive response to the item. Using the DSM-IV-MR-J screen, youth are classified as problem gamblers if they score four or more positive responses, and are classified as non-problem gamblers if they score three or fewer positive responses.

The non-gambling-related items in the 2017 questionnaire captured data on:

- Ethnicity
- Use of technology and media
- Cultural connectedness
- Religion
- Relationships with parents and friends
- Household finances
- Schooling
- Future aspirations (education and career)
- Family's role in schooling and career aspirations
- Employment

⁷ Note that because data collection spanned 13.5 months, it is possible that a few of the youth were 18 years old at that time.

⁸ Diagnostic Statistical Manual-IV-Multiple-Response-Adapted for Juveniles.

- Behaviour including gang involvement and bullying
- Health including sexual health and sexuality
- Substance use (alcohol, smoking, other drugs)

Data analysis

Data were analysed using Stata version 14.0. A p-value of 0.05 was used to denote statistical significance.

Means, standard deviations, percentages and 95% confidence intervals were used, where appropriate, to present descriptive detail of gambling participation; gambling-related behaviours; and social, health and environmental factors for the 17 year old youth. Subgroup analyses were also performed for youth who have gambled in the past year.

For descriptive analysis of the DSM-IV-MR-J screen data, when youth did not answer one or more questions, based on the possibility that an indicative score may be reached even when all screen questions are not answered, all respondents with missing values were included in the analysis (Rossen, 2008). Fully complete responses to all screen questions may have resulted in higher scores than reported here; therefore, scores for individual screen dimensions and total scores should be considered indicative only. The cut-score for problem gambler is 4 with scores between 0 and 3 categorised as non-problem gambler (Fisher, 2000).

To identify factors associated with gambling, bivariate and multiple logistic regression analyses were performed. Bivariate logistic regression was used to identify which factors were individually associated with gambling in the past year. Forward stepwise regression was then performed to build a parsimonious multiple logistic regression model. Significant factors were included into the model if they provided statistically significant benefits above that already held within the model. Odds ratios and 95% confidence intervals that show the statistical strength of associations between the gambling and explanatory variables are presented.

RESULTS

Findings pertaining to the youth when they were 17 years old are presented with reference, where relevant and possible, to the data from the same youth when they were 14 or 9 years old. The latter data are presented in separate reports (Bellringer et al., 2012; Bellringer et al., 2017), which should be read in conjunction with this report. Note that only a few comparisons between the years have been made as a majority of the questions were worded differently between the years. The current questions, when the youth were 17 years old are substantially more extensive and comprehensive than the questions when the youth were 14 years old.

Gender and ethnicity of youth

Table 1 shows the gender and ethnicity of the youth in 2014 and 2017⁹; there were no statistically significant differences between the samples. Across the years, the gender split was relatively even. Slightly less than half of the youth were Samoan, about one-fifth were Tongan, about 15% were Cook Islands Māori and the rest identified as ‘Other’ ethnicity.

Table 1: Gender and ethnicity of youth aged 14 years and 17 years

Demographic variable	14 years		17 years		14 years vs. 17 years p-value
	n	%	n	%	
Gender					0.226
Male	471	50.6	326	51.6	
Female	460	49.4	306	48.3	
Ethnicity					0.604
Samoan	420	45.9	290	46.5	
Tongan	194	21.2	133	21.3	
Cook Islands Māori	135	14.8	94	15.1	
Other [†]	166	18.1	104	16.7	
<i>Total</i>	<i>931</i>		<i>632</i>		

[†] Niuean, Fijian, Fijian Indian, Tokelauan, Māori or European/Pākehā

Gambling participation

The activities youth gambled on

All youth were presented with a list of 13 activities and asked if they had bet or played for money on any of those activities in the prior year. About one-third (31.7%) of the 632 youth reported that they had gambled for money on at least one activity. Bets with friends or family was the most frequently reported (13.7%), followed by betting on sports matches (8.1%) and card games (7.8%). Gambling for money on marbles games (5.8%) and on house/bingo (5.1%) were the next most frequently reported activities. Gambling for money on other activities was reported by less than 5% of the youth (Table 2).

Playing for money on Instant Kiwi, which has an age restriction of 18 years, was reported by 3.2% of the 17 year old youth.

⁹ Note that not all the youth who were surveyed in 2014 were re-surveyed in 2017, and similarly, not all the youth surveyed in 2017 had been surveyed in 2014.

Three years earlier when the youth were 14 years old, the same gambling activities were the most frequently reported, although percentages are not directly comparable due to different question wording. At age 17 years, youth were asked about past year gambling; when aged 14 years the youth were asked about lifetime (“have you ever”) gambling.

Table 2: Gambling participation by activity - all respondents

Gambling activity	Yes		
	n	%	(95% CI)
Bets with friends or family	84	13.7	(11.2 - 16.7)
Sports match	50	8.1	(6.2 - 10.5)
Card game	48	7.8	(5.9 - 10.2)
Game of marbles	36	5.8	(4.2 - 8.0)
Housie/bingo	32	5.1	(3.7 - 7.2)
Board game	24	3.9	(2.6 - 5.8)
Instant Kiwi (scratchies)	20	3.2	(2.1 - 4.9)
Dice	19	3.0	(1.9 - 4.7)
Games on a mobile phone/tablet (e.g. text games)	17	2.7	(1.7 - 4.4)
Lotto (including Strike and Powerball)	13	2.1	(1.2 - 3.6)
Internet gambling (e.g. internet casinos or poker)	5	0.8	(0.3 - 1.9)
Keno	2	0.3	(0.1 - 1.3)
Any other gambling activity	17	2.7	(1.7 - 4.4)
<i>Total</i>	<i>193</i>	<i>31.7</i>	<i>(28.2 - 35.6)</i>

N = 632

Of the youth who had gambled in the prior year, bets with friends or family remained the most frequently reported with almost half the gamblers reporting this activity (44.9%). Next most reported were betting on sports matches (26.5%), card games (26.1), marbles games (19.3%), housie/bingo (16.9%), board games (12.8%), Instant Kiwi (10.6%), and dice games (10%). Playing for money on other activities was reported by less than 10% of the youth gamblers (Table 3).

Table 3: Gambling participation by activity - gamblers only

Gambling activity	Yes			
	N	n	%	(95% CI)
Bets with friends or family	187	84	44.9	37.9 - 52.1
Sports match	189	50	26.5	20.6 - 33.2
Card game	184	48	26.1	20.2 - 32.9
Game of marbles	187	36	19.3	14.2 - 25.6
Housie/bingo	189	32	16.9	12.2 - 23.0
Board game	187	24	12.8	8.7 - 18.5
Instant Kiwi (scratchies)	188	20	10.6	7.0 - 15.9
Dice	190	19	10.0	6.5 - 15.2
Games on a mobile phone/tablet (e.g. text games)	190	17	8.9	5.6 - 13.9
Lotto (including Strike and Powerball)	190	13	6.8	4.0 - 11.4
Internet gambling (e.g. internet casinos or poker)	189	5	2.6	1.1 - 6.2
Keno	190	2	1.1	0.3 - 4.1
Any other gambling activity	187	17	9.1	5.7 - 14.2

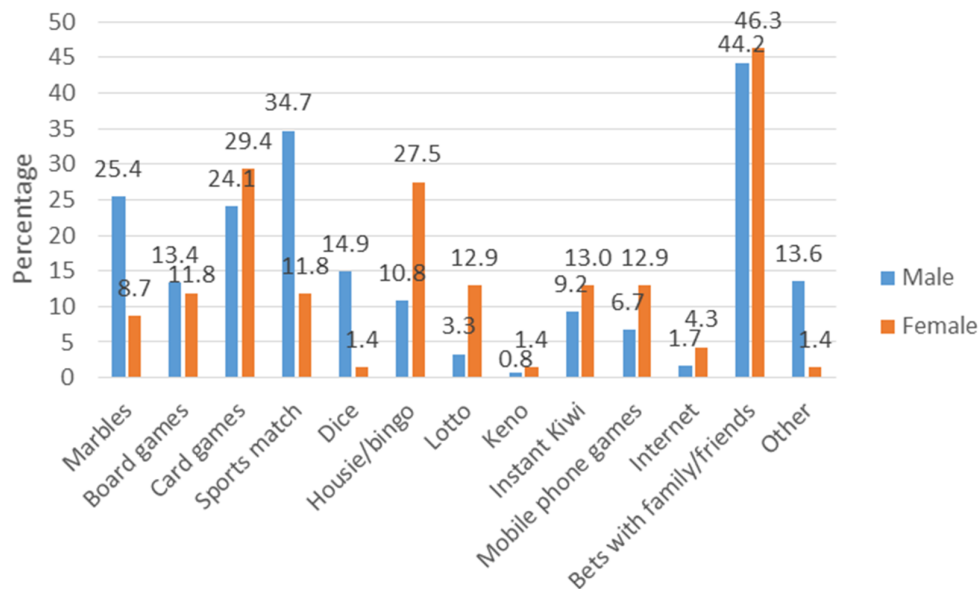
Gender differences in gambling activity preferences

A larger percentage of boys had gambled in the prior year (39.0%, 95% CI 33.8% - 44.6%), compared with girls (23.9%, 95% CI 19.3% - 29.1%). Figure 1 shows that overall, socially interactive gambling activities such as making bets with family and friends, and betting on card games and board games were equally favoured by boys and girls. Similarly, there were no gender differences in participation for gambling activities that are usually solo, that is to say, activities that only require one person. These included the purchase of Instant Kiwi tickets, playing games for money on a mobile phone or tablet, internet gambling, and betting on Keno.

Larger proportions of boys, compared with girls, bet on games where some element of skill was involved such as games of marbles and sports matches, although contrary to this finding was that boys also preferred betting on games of dice, despite the outcomes of dice games being completely by chance. Generally, girls preferred games of chance, compared with boys, with a larger proportion of girls betting on housie/bingo and Lotto.

A larger proportion of boys, compared with girls, also participated in ‘other’ forms of gambling. This included ‘pitch and toss’ (betting on which coin will be closest when tossed at a wall), betting on competitive activities (e.g. catching the largest fish), e-sports betting and betting on one specific sports match or poker game.

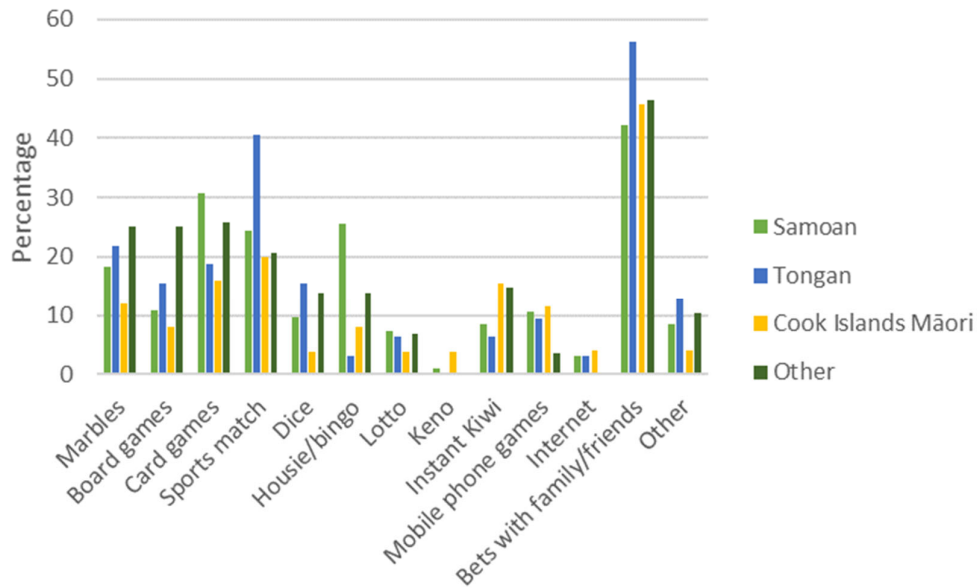
Figure 1: Gambling participation by activity and gender – gamblers only



Ethnic-specific differences in gambling activity preferences

Overall, the sample size was sufficient for data to be examined by Samoan, Tongan, Cook Islands Māori and Other ethnicities. Although there were some fluctuations in participation prevalence between the ethnicities, likely to be the result of a very small sample size in some cases, overall there were no major differences in gambling activity preferences by the different ethnicities (Figure 2), indicated by overlapping 95% confidence intervals (not shown).

Figure 2: Gambling participation by activity and ethnicity – gamblers only



Number of gambling activities participated in

On average, approximately two gambling activities were participated in by the youth gamblers. There were no major gender or ethnic-specific variations (Table 4).

Table 4: Number of gambling activities by gender and ethnicity – gamblers only

Demographic variable	Number of activities		
	n	Mean	SD
Gender			
Male	123	2.0	1.4
Female	70	1.8	1.3
Ethnicity			
Samoan	96	2.0	1.4
Tongan	32	2.1	1.5
Cook Islands Māori	26	1.5	1.0
Other [†]	29	2.0	1.1

[†] Niuean, Fijian, Fijian Indian, Tokelauan, Māori or European/Pākehā

Frequency of gambling

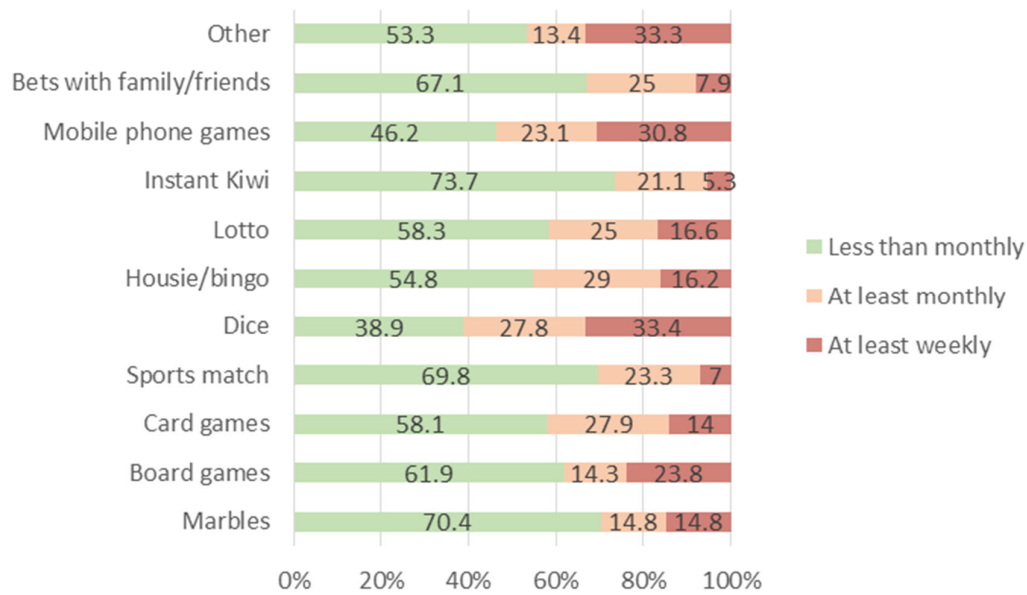
The youth gamblers were asked how often they took part in each gambling activity. Figure 3 details gambling frequency for each activity. Keno and internet gambling are not detailed in the figure as the sample size was very small for those activities.

For most of the activities, the majority of youth gambled less than monthly (between 53.3% and 73.7%), thus betting for money was an infrequent activity. This finding was similar to that

when the youth were 14 years old where, of the youth who had ever gambled, 58% had not done so in the past year and 27% had only gambled once or twice in the prior year.

Two exceptions when the youth were 17 years old were gambling on dice and playing games for money on a mobile phone or tablet where only 38.9% and 46.2%, respectively, gambled less than monthly. For both of these activities, about one-third of the youth gambled at least weekly and about one-quarter gambled at least monthly. The other activities with relatively high monthly and/or weekly gambling were betting on card games (41.9%), housie/bingo gambling (45.2%), buying Lotto tickets (41.6%) and ‘other’ gambling (46.7%). The most common gambling activity of betting with family and friends was an infrequent activity with two-thirds (67.1%) doing this less than monthly, one-quarter (25.0%) doing it at least monthly and 7.9% doing it at least weekly.

Figure 3: Frequency of gambling by activity – gamblers only



Note: Less than monthly = once or twice in the past 12 months / At least monthly = once in the last four weeks, and two or three times in the last four weeks / At least weekly = about once a week, several times a week, and most days

Examination of the frequency of gambling on the different activities by gender and ethnicity was not possible due to small sample sizes.

Gambling expenditure

The youth gamblers were asked how much money they would usually spend each week on each gambling activity. Figure 4 details usual weekly expenditure on each activity. Keno and internet gambling are not detailed in the figure as the sample size was very small for those activities.

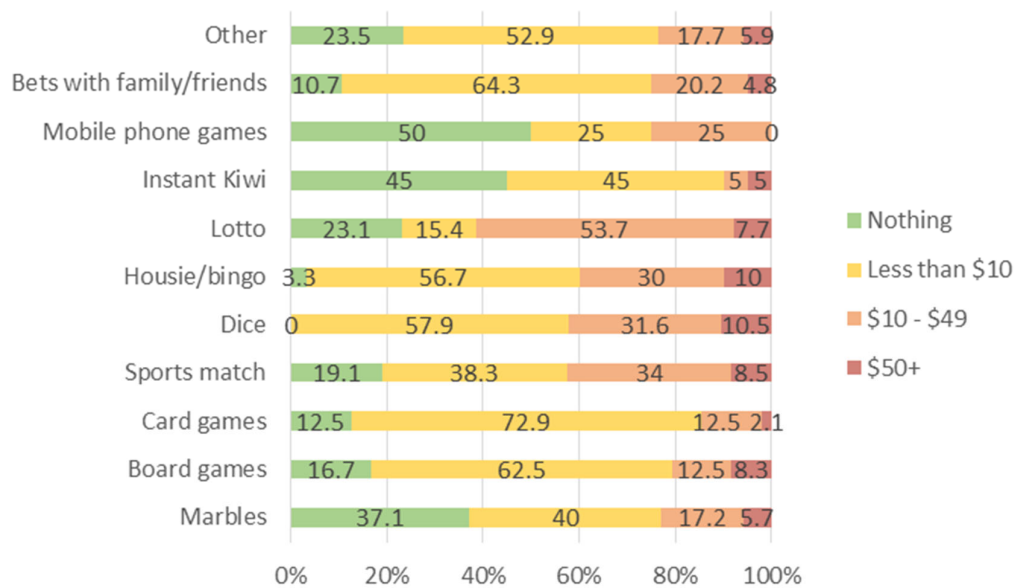
As detailed in the previous section, a majority of youth gambled less than monthly on most of the activities. Therefore, it is not surprising that for all activities apart from gambling on dice, some youth (ranging from 3.3% to 50%) reported not having any usual weekly expenditure on those activities. Dice gambling was different as no youth reported usually spending nothing on

the activity each week. What is notable, however, is that the proportions of youth without a usual weekly expenditure on the activity was generally less than the proportion who gambled less than monthly on that activity. This implies that some youth were probably reporting their usual expenditure when they gambled on a particular activity rather than their usual *weekly* expenditure.

For all activities apart from Lotto and playing games for money on a mobile phone or tablet, the largest proportion of the youth who had a usual weekly expenditure on that activity, bet less than \$10 (38.3% to 72.9%). For Lotto, 53.7% of youth had weekly expenditure of between \$10 and \$49, compared with 15.4% at less than \$10. For playing games for money on a mobile phone/tablet, 25% each spent less than \$10 or between \$10 and \$49 weekly.

It is noteworthy that for each of the gambling activities, a minority of youth reported a relatively high weekly expenditure of \$50 or more (ranging from 2.1% on card game bets to 10.5% on betting on dice games), apart from mobile phone/tablet game betting where no-one reported the higher level of expenditure.

Figure 4: Usual weekly expenditure by gambling activity – gamblers only



Examination of gambling expenditure on the different activities by gender and ethnicity was not possible due to small sample sizes.

Time spent gambling each day

The youth gamblers were asked to report how much time they would usually spend *each day* on bets or gambling (Table 5). Overall, a majority (62.2%) did not usually spend any time gambling each day. However, a substantial minority (37.8%) reported usually spending some time each day gambling, with 1.2% reporting a long period of more than three hours a day.

These findings were similar to those reported by the youth when they were 14 years old.

Table 5: Usual time spent gambling each day – gamblers only

Time gambling per day	Total (n=164)	
	%	(95% CI)
None	62.2	(54.5 - 69.3)
< 15 minutes	22.6	(16.8 - 29.6)
15 - 29 minutes	4.9	(2.5 - 9.5)
30 - 59 minutes	7.3	(4.2 - 12.5)
1 - 3 hours	1.8	(0.6 - 5.5)
> 3 hours	1.2	(0.3 - 4.8)

Time spent gambling each day by gender and ethnicity

There were no major gender (Figure 5) or ethnic-specific (Figure 6) differences in daily time spent gambling. Some fluctuations were apparent, due to small numbers in some cases.

Figure 5: Usual time spent gambling each day by gender – gamblers only

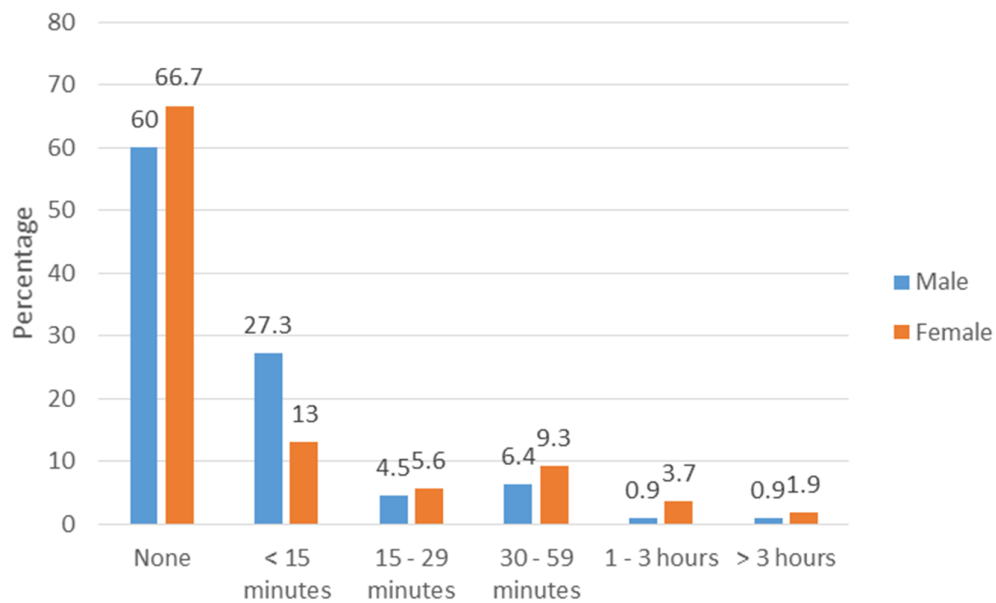
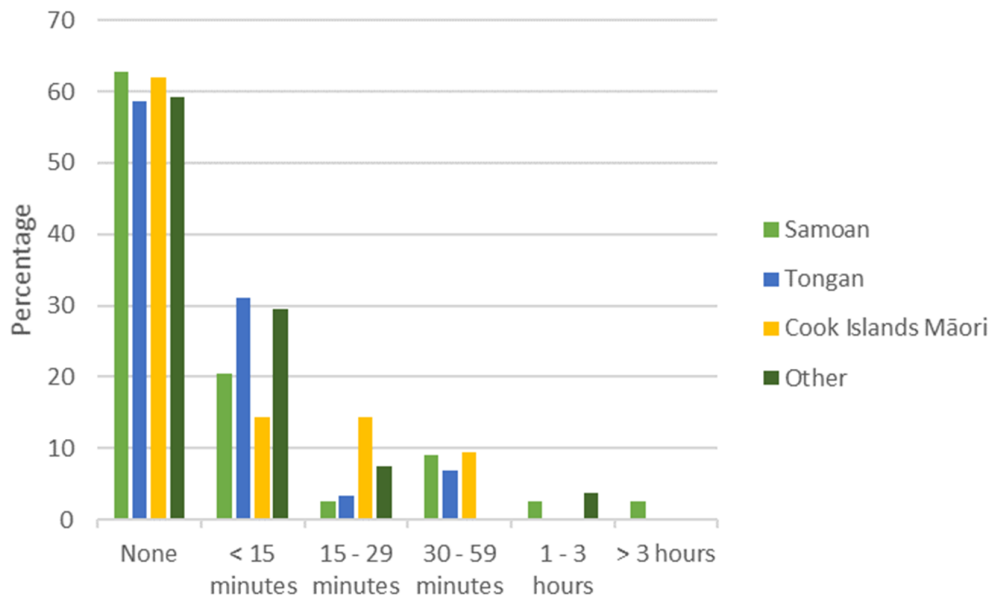


Figure 6: Usual time spent gambling each day by ethnicity – gamblers only



Social context of gambling

Youth gamblers were asked with whom they usually gambled (multiple responses were allowed). The largest proportions of youth gambled with family (49.2%) or friends (47.7%). A few youth gambled with other people they knew (7.3%) and a few gambled alone (5.2%). A very small minority (0.5%) gambled with people they did not know (e.g. strangers met online) (Table 6).

These findings were similar to those reported by the youth when they were 14 years old.

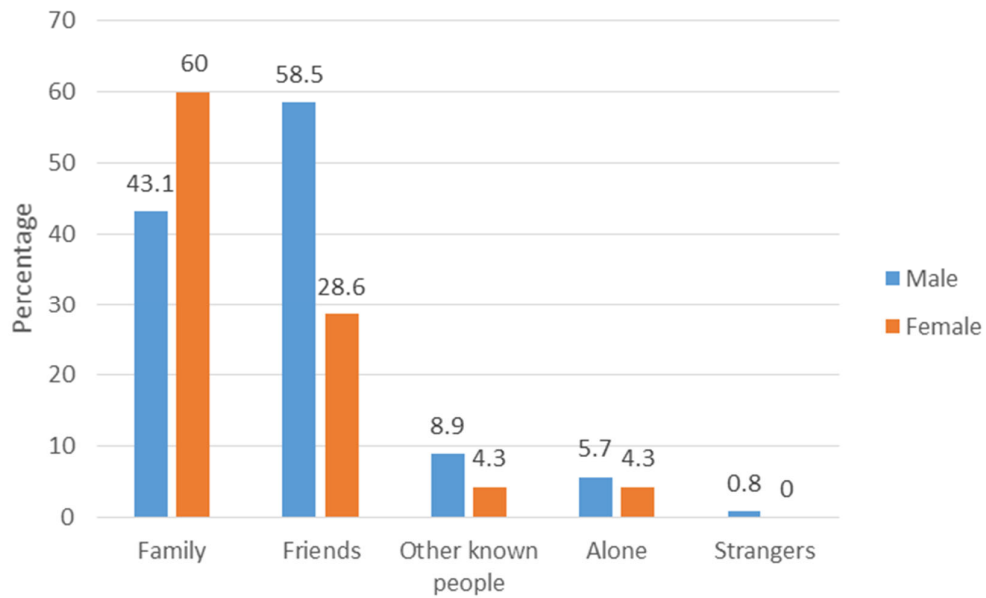
Table 6: With whom youth gambled – gamblers only

Person with whom gambled	Total (n=193)	
	%	(95% CI)
Family	49.2	(42.2 - 56.3)
Friends	47.7	(40.7 - 54.7)
Other known people	7.3	(4.3 - 11.9)
Alone	5.2	(2.8 - 9.4)
Strangers (e.g. people online)	0.5	(0.1 - 3.6)

Gender differences in the social context of gambling

Compared with girls, almost twice as many boys gambled with friends (58.5% vs. 28.6%), as girls were more likely to gamble with family (60%) than friends (28.6%). There were no other major gender differences in regard to whom the youth gambled with (Figure 7).

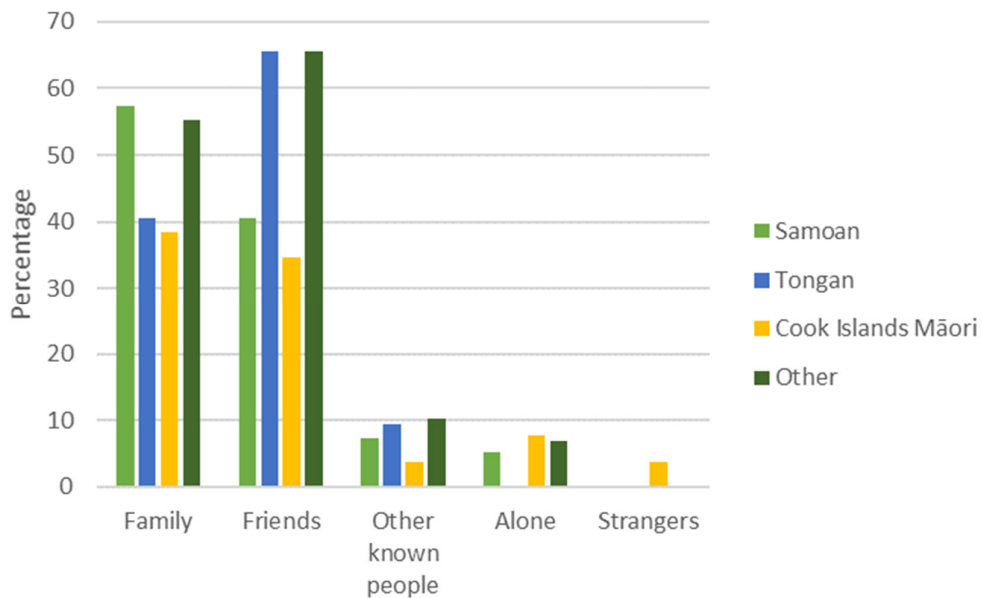
Figure 7: With whom youth gambled by gender – gamblers only



Ethnic-specific differences in the social context of gambling

There were no major ethnic-specific differences in regard to whom the youth gambled with. Although it may appear that there are some differences in Figure 8 below, this is due to small sample sizes meaning that a single person may be represented by a relatively large percentage.

Figure 8: With whom youth gambled by ethnicity – gamblers only



Reasons for gambling

Youth gamblers were asked why they participated in gambling or bet for money from a list of 14 options (multiple responses were allowed) (Table 7). Almost three-quarters of youth (71.5%) reported that they gambled to have fun and two-fifths (40.4%) to win money. One-quarter of the youth (24.9%) gambled for a challenge. Smaller percentages reported gambling due to boredom (15%) or to get a buzz (13%). Almost one-fifth (18.7%) of the youth selected ‘none of these’ reasons from the list, implying that they gambled for other reasons. No youth reported gambling because of loneliness.

A small percentage of youth showed indications of harmful gambling behaviours with 3.1% gambling because they were short of money and 1% because they could not stop.

These findings were similar to those reported by the youth when they were 14 years old.

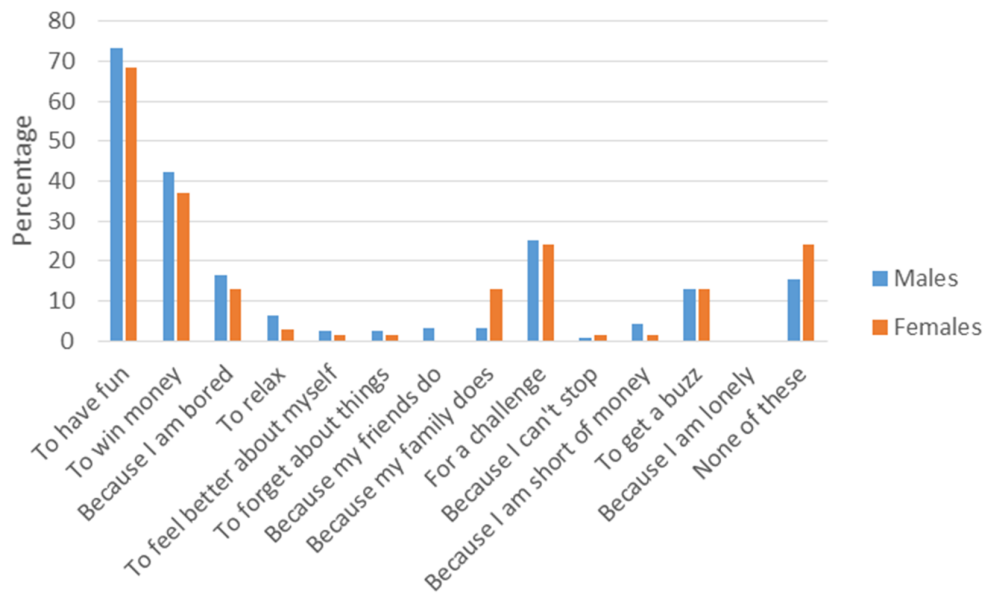
Table 7: Reasons for gambling – gamblers only

Reason for gambling	Total (n=193)	
	%	(95% CI)
To have fun	71.5	(64.7 - 77.4)
To win money	40.4	(33.7 - 47.5)
For a challenge	24.9	(19.3 - 31.5)
Because I am bored	15.0	(10.6 - 20.8)
To get a buzz	13.0	(8.9 - 18.5)
Because my family does	6.7	(3.9 - 11.3)
To relax	5.2	(2.8 - 9.4)
Because I am short of money	3.1	(1.4 - 6.8)
To feel better about myself	2.1	(0.8 - 5.4)
To forget about things	2.1	(0.8 - 5.4)
Because my friends do	2.1	(0.8 - 5.4)
Because I can't stop	1.0	(0.3 - 4.1)
Because I am lonely	0	-
None of these	18.7	(13.8 - 24.8)

Gender differences in the reasons for gambling

A small percentage of boys (3.3%) reported that they gambled because their friends gamble. Girls did not report this reason for gambling. There were no other major differences between the genders (Figure 9). Although it appeared that a higher proportion of girls (12.9%) compared with boys (3.3%) reported gambling because their family gambles, the 95% confidence intervals overlapped meaning that there was not actually a difference.

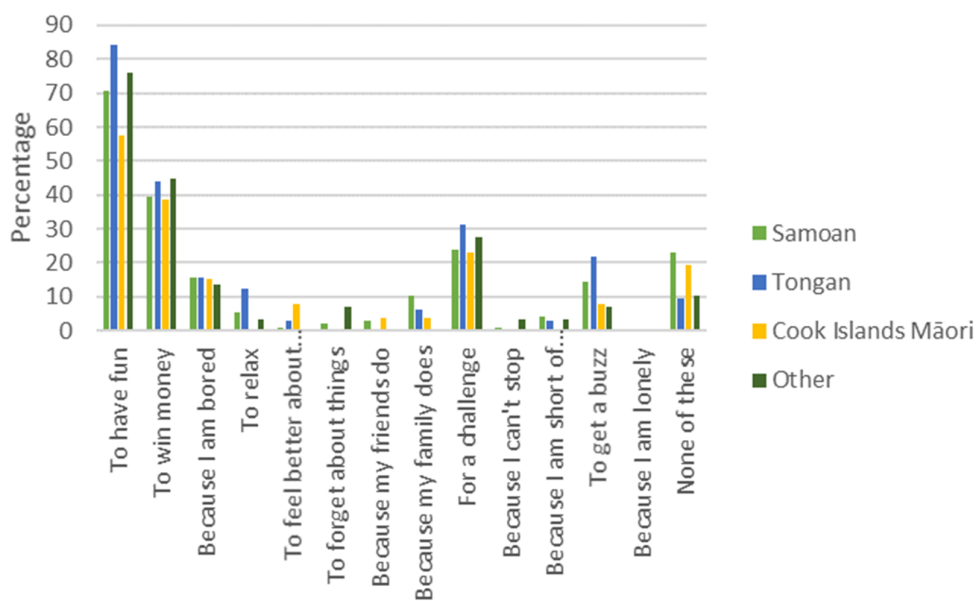
Figure 9: Reasons for gambling by gender – gamblers only



Ethnic-specific differences in the reasons for gambling

There were no major ethnic-specific differences in the reasons for gambling. Although it may appear that there are some differences in Figure 10 below, this is due to small sample sizes meaning that a single person may be represented by a relatively large percentage. This was indicated by the overlapping 95% confidence intervals showing that there was not actually a difference.

Figure 10: Reasons for gambling by ethnicity – gamblers only



Receiving an Instant Kiwi ticket as a gift

Overall, 2.3% (95% CI 1.4% - 3.9%) of the 17 year old youth reported that they had received an Instant Kiwi ticket as a gift in the prior year. When only gamblers were considered, 4.9% (95% CI 2.6% - 9.2%) had received an instant ticket as a gift. No major gender or ethnic-specific differences were identified.

Problem gambling and help-seeking behaviour

Problem gambling

The majority of youth did not gamble in a problematic way. Ten youth scored as problem gamblers, representing 1.6% of all youth and 4.7% of the youth who had gambled in the prior year (Table 8). When the youth were 14 years old, 2% of all youth and 3.7% of gamblers scored as problem gamblers.

Overall, a greater percentage of boys were problem gamblers than girls (2.5% vs. 0.6%). Of the gamblers, 5.7% of boys were problem gamblers compared with 2.8% of girls. There were no obvious ethnic-specific differences.

Table 8: DSM-IV-MR-J screen scores - all respondents

Gambling categorisation	Number of positive responses	All youth (N=619)		Gamblers (n=191)	
		%	(95% CI)	%	(95% CI)
Non- problem gambler	0	86.8	(83.8 - 89.2)	72.8	(66.0 - 78.6)
	1	8.2	(6.3 - 10.7)	14.1	(9.9 - 19.8)
	2	2.4	(1.5 - 4.0)	6.3	(3.6 - 10.8)
	3	1.0	(0.4 - 2.1)	2.1	(0.8 - 5.5)
	4	0.5	(0.2 - 1.5)	1.6	(0.5 - 4.8)
Problem gambler	5	0.8	(0.3 - 1.9)	2.1	(0.8 - 5.5)
	6	0.0	-	0.0	-
	7	0.3	(0.1 - 1.3)	1.0	(0.3 - 4.1)
	8	0.0	-	0.0	-
	9	0.0	-	0.0	-

Responses to individual DSM-IV-MR-J screen items by the gamblers are detailed in Table 9. The most endorsed item related to taking money without permission (i.e. stealing) to spend on gambling, with about one-fifth (21.7%) reporting this. The next most endorsed item related to risking education or relationships due to gambling, with one in ten gamblers (10.4%) reporting this. These were followed by chasing losses (8.1%), lying (5.8%), tolerance (5.6%) and withdrawal symptoms (4.5%).

Preoccupation with gambling, escaping from problems by gambling and loss of control were the least endorsed items each at 2.2% or less.

These findings were similar to those reported by the youth when they were 14 years old.

Table 9: Responses to individual DSM-IV-MR-J screen items – gamblers only

Dimension	In the past year...	n	%	(95% CI)
Preoccupation	...how often have you found yourself thinking about gambling or planning to gamble?	182	2.2	(0.8 - 5.7)
Tolerance	...have you needed to gamble with more and more money to get the amount of excitement you want?	179	5.6	(3.0 - 10.1)
Loss of control	...have you ever spent much more than you planned to on gambling?	175	0.6	(0.1 - 4.0)
Withdrawal	...have you felt bad or fed up when trying to cut down or stop gambling?	157	4.5	(2.1 - 9.1)
Escape	...how often have you gambled to help you escape from problems or when you are feeling bad?	173	1.7	(0.6 - 5.3)
Chasing	...after losing money gambling, have you returned another day to try and win back money you lost?	172	8.1	(4.9 - 13.3)
Lying	...has your gambling ever led to lies to your family?	173	5.8	(3.1 - 10.4)
Illegal acts[†]	...have you ever taken money from the following without permission to spend on gambling: school dinner money or fare money?	189	21.7	(16.4 - 28.2)
	...have you ever taken money from the following without permission to spend on gambling: money from your family?			
	...have you ever taken money from the following without permission to spend on gambling: money from outside the family?			
Risking education or relationship[†]	...has your gambling ever led to arguments with family/friends or others?	182	10.4	(6.7 - 15.8)
	...has your gambling ever led to missing school?			

[†] Answering positively to any of the sub-questions in the domain was deemed to be a positive response to that domain (illegal acts, and risking education or relationship)

Worry over time or money spent gambling

Of the youth who gambled, slightly more than one-quarter (27.8%) reported some level of worry about the amount of time or money they spent gambling (Table 10). This was similar to the finding when the youth were 14 years old. There were no major gender or ethnic-specific differences.

As expected, however, there was a difference between the non-problem gamblers and the problem gamblers. Two-thirds (66.6%) of problem gamblers reported some level of worry about their gambling compared with one-quarter (25.5%) of non-problem gamblers (Table 10).

Table 10: Worry over time or money spent on gambling – gamblers only

Worry about gambling	All gamblers (n=158)		Non-problem gamblers (n=149)		Problem gamblers (n=9)	
	%	(95% CI)	%	(95% CI)	%	(95% CI)
Not at all	72.2	(64.6 - 78.6)	74.5	(66.9 - 80.9)	33.3	(11.1 - 66.7)
A little	17.7	(12.5 - 24.5)	16.1	(11.0 - 22.9)	44.4	(17.6 - 74.9)
Some	5.7	(3.0 - 10.6)	5.4	(2.7 - 10.4)	11.1	(1.5 - 50.1)
A lot	4.4	(2.1 - 9.0)	4.0	(1.8 - 8.7)	11.1	(1.5 - 50.1)

Similar proportions (about one-third) of non-problem gamblers and problem gamblers had ever tried to reduce or quit gambling (Table 11), even though two-thirds of problem gamblers had reported a level of worry about their gambling. This may be due to the majority of the latter

group only being ‘a little’ worried compared with about one in ten each having ‘some’ worry or ‘a lot’ of worry.

Table 11: Tried to reduce or quit gambling – gamblers only

Reduce or quit gambling	Non-problem gamblers (n=113)		Problem gamblers (n=8)	
	%	(95% CI)	%	(95% CI)
No	66.4	(57.2 - 74.50)	62.5	(28.4 - 87.5)
Yes	33.6	(25.5 - 42.8)	37.5	(12.5 - 71.6)

Help-seeking

From a list of 10 options, gamblers were asked to indicate from whom they would seek help if they had problems or concerns with their gambling (i.e. potential behaviour), and also if they had actually sought help in the prior year from any of those sources (i.e. actual behaviour). Multiple responses were allowed.

Overall, one-fifth (19.9%) of all youth had actually sought help for their gambling. Of the gamblers, almost two-thirds (65.3%) had sought help for gambling, with a majority only seeking help from one source. However, almost one-tenth (9.4%) of gamblers had sought help from two or more sources (Table 12).

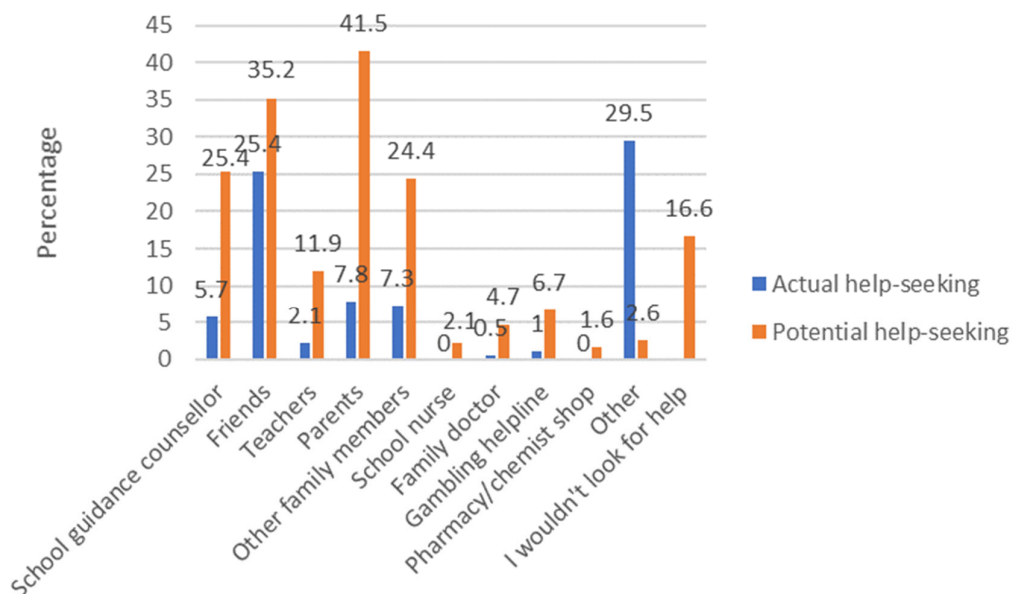
Table 12: Number of sources of help sought - all respondents and gamblers only

Number of sources of help sought	All youth (N=634)		Gamblers (n=193)	
	%	(95% CI)	%	(95% CI)
0	80.1	(76.8 - 83.1)	34.7	(28.3 - 41.7)
1	17.0	(14.3 - 20.2)	56.0	(48.9 - 62.8)
2	1.9	(1.1 - 3.3)	6.2	(3.6 - 10.6)
3	0.5	(0.2 - 1.5)	1.6	(0.5 - 4.7)
≥ 4	0.5	(0.2 - 1.5)	1.6	(0.5 - 4.7)
At least one source	19.9	(16.9 - 23.2)	65.3	(58.3 - 71.7)

From Figure 11 it is apparent that potential behaviour does not translate to actual behaviour when it comes to talking to adults about gambling concerns. Two-fifths (41.5%) of gamblers reported that they would potentially seek help from parents, about one-third (35.2%) from friends, and about one-quarter each from a school guidance counsellor or from other family members. However, actual help-seeking behaviour was somewhat different and appeared to avoid direct communication with adults. The most common source of actual help was from friends (25.4%), and about one-third (29.5%) of youth had sought help from sources other than detailed in the list. Youth were not asked to detail what the ‘other’ source of actual help was, but it is possible that this included self-help materials accessible online.

No major gender or ethnic-specific differences were noted.

Figure 11: Help-seeking for gambling concerns – gamblers only



Gambling transitions

Of the 12 youth who were problem gamblers at 14 years of age, who were re-surveyed when 17 years old, only three remained problem gamblers with the other nine having become non-problem gamblers. Conversely, seven of the 10 problem gamblers amongst 17 year old youth had been non-problem gamblers at age 14 years (Table 13).

Table 13: Transitions in problem gambling from age 14 years to age 17 years

		17 years		<i>Total</i>
		Non-problem gambler	Problem gambler	
14 years	Non-problem gambler	567	7	574
	Problem gambler	9	3	12
	Total	576	10	586

Co-existing issues and behaviours

Substance use

Full data are presented in Appendix 2.

Although not directly comparable because of the different time frames, participation in gambling activities in the prior year was as common as smoking cigarettes, e-cigarettes and marijuana amongst the 17 year old youth, with about one-third of youth reporting ever having taken part in these latter behaviours. However, alcohol consumption was substantially more prevalent than gambling with almost three-quarters of youth ever reporting this, whilst taking legal highs was substantially less than gambling, with less than one-fifth of youth ever doing this (Figure 12).

When the youth were 14 years old, regularly gambling for money was reported by almost twice as many respondents (15%) as those who smoked cigarettes or consumed alcohol (6.7% and 6.2%, respectively), and almost four times as high as those who used marijuana (3.6%).

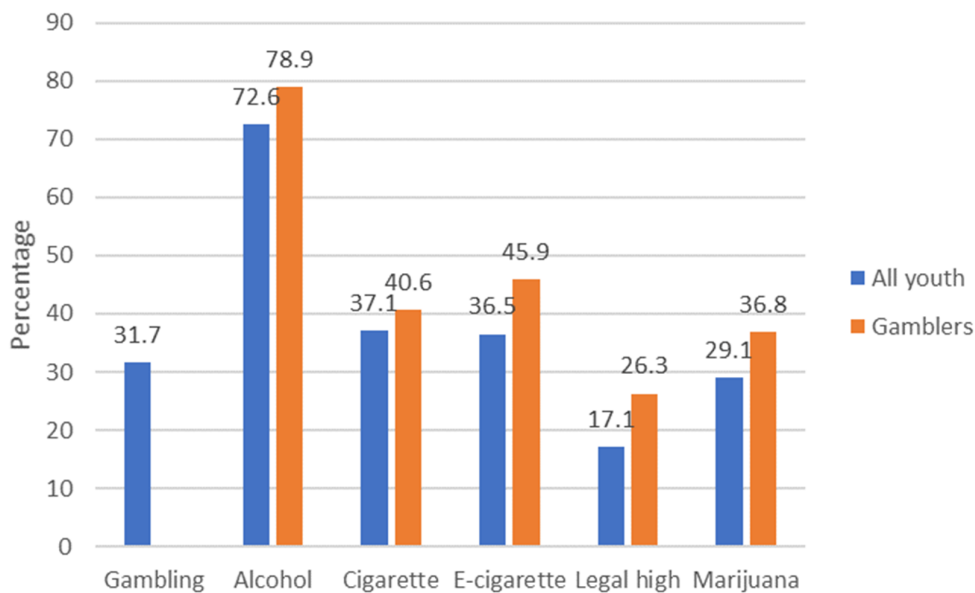
About three-quarters (72.6%) of all youth had ever drunk alcohol, even if it was a small amount (Figure 12). Of these, half (51.2%) had not drunk alcohol in the prior month, whilst 14.3% drank once a week or more often. One in nine youth reported drinking five or more drinks in one session (binge drinking) at least once a week or more often. There were no major differences between gamblers and all youth.

Slightly more than one third (37.1%) of all youth had ever smoked a cigarette, even if it was just a few puffs (Figure 12). Of these, a majority (69.1%) had done so before the age of 16 years. About one-third (36.5%) of all youths also reported having tried electronic cigarettes. There were no major differences between gamblers and all youth.

Slightly less than one-third (29.1%) of all youths had ever smoked marijuana (i.e. pot, grass, weed or cannabis), and 17.1% had ever used a legal high (such as synthetic cannabis, party pills and herbal highs) (Figure 12). A small minority of youth smoked marijuana or used legal highs once a week or more often (6.2% and 2.7% respectively). There were no major differences between gamblers and all youth.

These findings differ from when the youth were 14 years old at which time substantially lower percentages had used these substances in the prior month: alcohol (6.2%), cigarettes (6.7%) or marijuana (3.6%).

Figure 12: Gambling and substance use - all respondents and gamblers only



Health

Full data are presented in Appendix 2.

All youth were asked to self-report their level of health. Almost three-quarters (71.1%) reported that, in general, their health was good, very good or excellent. About one-fifth (21.4%) of all

youth had thoughts about suicide in the prior year whilst 9.9% had attempted suicide. There were no major differences between gamblers and all youth.

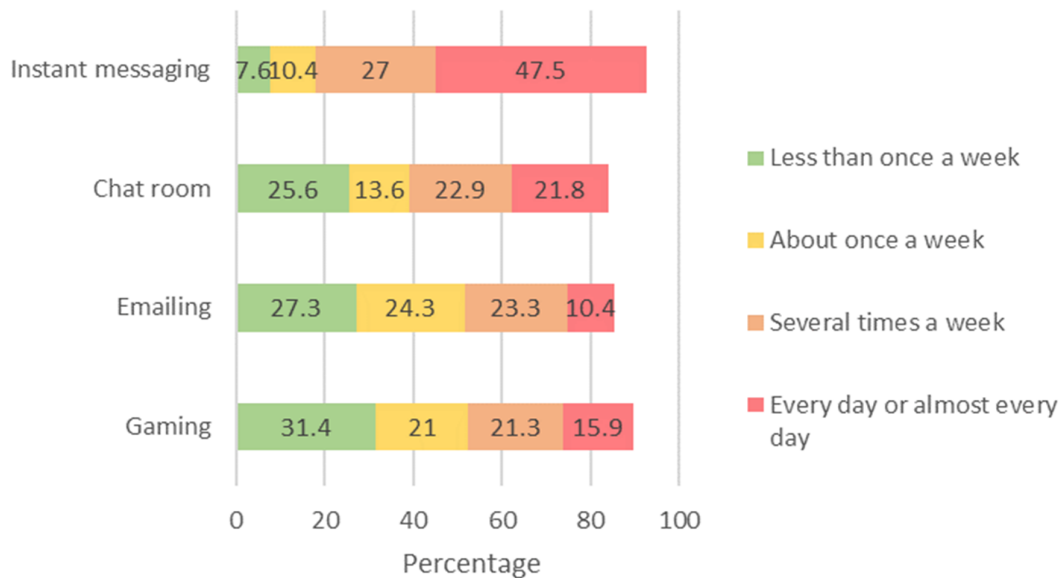
Online behaviours

Full data are presented in Appendix 2.

Spending time online was common amongst the youth with slightly more than half (54.2%) spending three to six hours per day on this activity. About one-quarter (25.6%) spent less time online and about one-fifth (20.2%) of youth spent seven or more hours online per day. There were no major differences between gamblers and all youth.

The youth were asked about the frequency of specific online activities including gaming, emailing, chatting in a chat room, and instant messaging (Figure 13). Instant messaging was the most frequently performed activity with 47.5% of youth doing this every day or almost every day, and 27% doing it several times a week. Chat room chatting was the next most frequent online activity with 44.7% doing this several times a week or more often. Emailing and gaming were more likely to be undertaken weekly or less frequently. There were no major differences between gamblers and all youth.

Figure 13: Frequency of online activities - all respondents



Delinquent behaviours

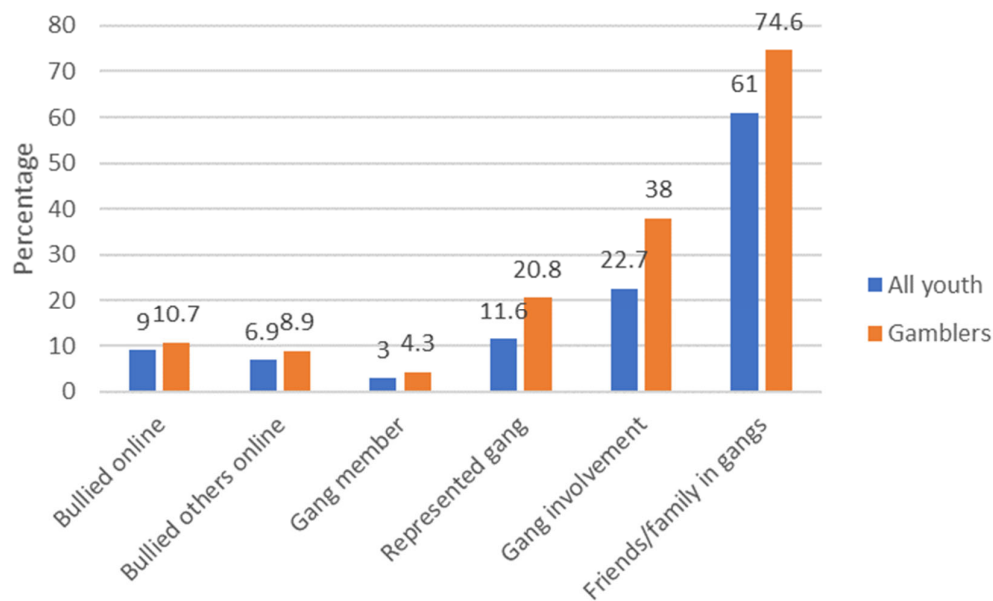
Full data are presented in Appendix 2.

Youth were asked about delinquent behaviours such as bullying and gang involvement. A minority of the youth reported being bullied online (9.0%) or bullying others online (6.9%) in the prior couple of months (Figure 14). There were no major differences between gamblers and all youth.

Although only 3% of the youth reported being a gang member, 11.6% had done things to represent a gang such as spray-painting gang signs or getting into fights, and 22.7% had involvement with gangs such as wearing gang colours or using gang signs. Almost two-thirds (61%) of all youth reported that they have friends or family (including extended family) who were members of a gang (Figure 14). A gang was described to the youth as “any street club that carries a name, wears particular colours etc”.

Unlike the other co-existing issues and behaviours, gang behaviours were different between gamblers and all youth. Although a similar percentage of gamblers were gang members to all youth (4.3% and 3.0% respectively), larger proportions of gamblers reported doing things to represent a gang (20.8%) and had involvement with gangs (38.0%) than all youth (11.6% and 22.7%, respectively). Gamblers were also more likely to have friends or family members in gangs (74.6% vs. 61.0%) (Figure 14).

Figure 14: Bullying and gang behaviour - all respondents and gamblers only



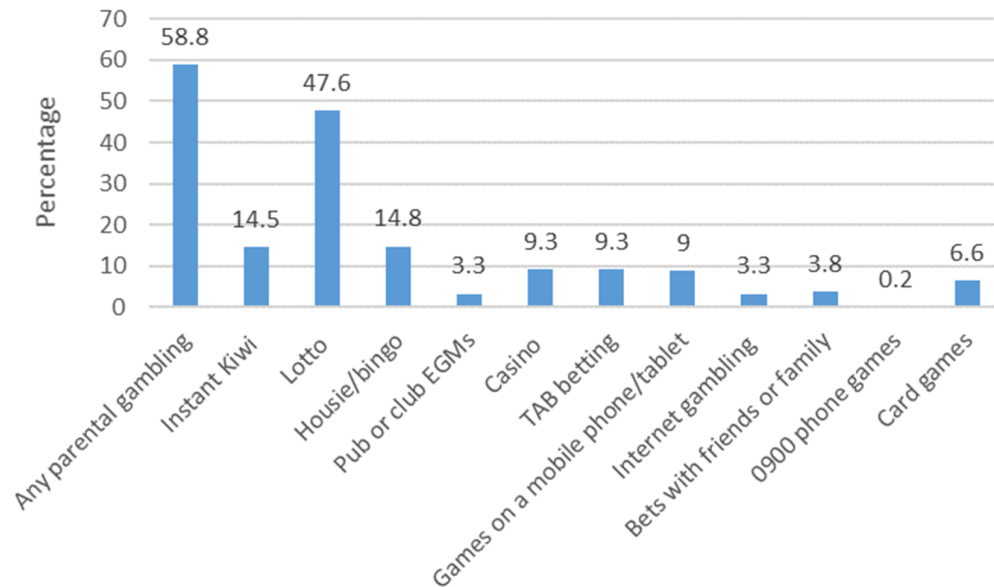
Someone else’s gambling and household problems

Parental gambling

From a checklist of 11 gambling activities, youth were asked to identify which activities their parent/s or caregiver/s played or did. Multiple responses were allowed. Parental gambling on at least one activity was endorsed by 58.8% of all youth and by 63.2% of the gamblers. Lotto (including Strike and Powerball) was the most frequently reported (47.6%), followed by betting on housie/bingo (14.8%) and Instant Kiwi (14.5%). Casino gambling on table games and/or EGMs and Totalisator Agency Board (TAB) betting on track and/or sports betting (both 9.3%), and games on a mobile phone/tablet (9.0%) were the next most frequently reported activities. Card games such as poker were reported by 6.6% of youth. Parental gambling on other activities was reported by less than 5% of the youth (Figure 15).

Boys and girls reported similar prevalence of parental gambling in the different activities. However, when the data were examined by ethnicity, a higher proportion of Samoan youth reported parental gambling on housie/bingo (23.8%) than the other ethnicities (3.0% to 10.5%).

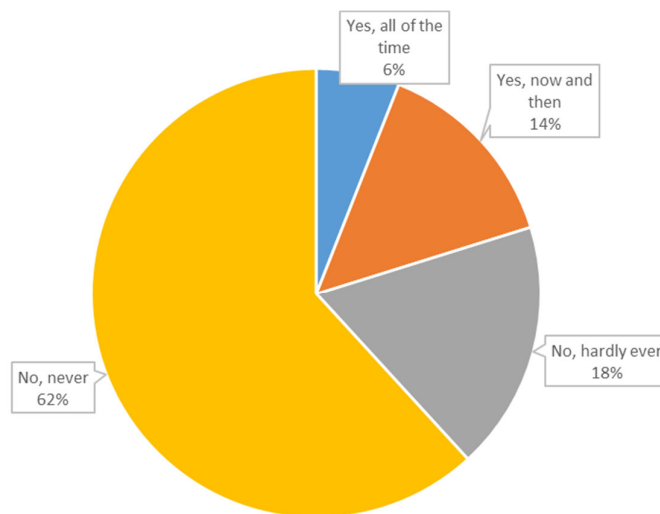
Figure 15: Parental gambling by activity - all respondents



Worry about parental or family gambling

One-fifth (20%) of youth reported worrying or feeling anxious about how much money or time other people they lived with (parents and family) spent gambling (Figure 16). There were no major gender or ethnic-specific variations.

Figure 16: Worry about parental or family gambling - all respondents

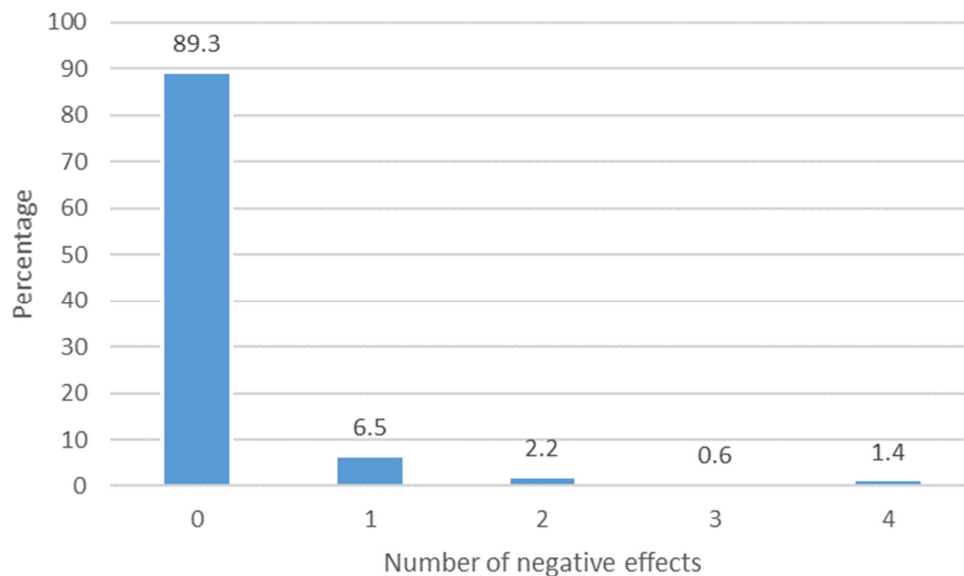


Household problems from someone else's gambling

Youth were asked to report how many times each of the following four occurrences had happened in their family because of someone else's gambling: Had arguments or fights about time or money spent on betting or gambling, had to go without something needed (e.g. food) because too much money was spent on gambling or betting, some bills weren't paid because too much money was spent on gambling or betting, and a family member did things that could have got them into serious trouble (e.g. stealing) because of gambling. As the questions did not have a time frame, the negative effects experienced could have been within a lifetime and were not necessarily experienced currently.

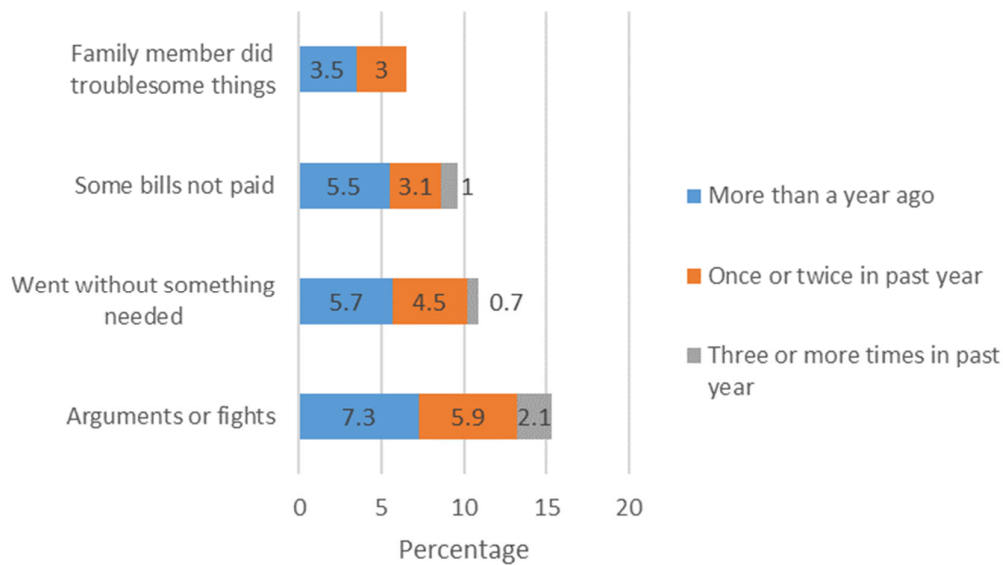
A substantial minority (10.7%) of the youth reported at least one of the four household problems, with experiencing only one problem being most common, reported by one in fifteen youth (6.5%) (Figure 17).

Figure 17: Number of household problems due to someone else's gambling - all respondents



From questions that asked about the frequency of the experienced household problems, it was apparent that these were generally rare with a majority of the events taking place more than a year ago. Of the household problems which had been experienced in the prior year (i.e. current problems), arguments or fights, and having to go without something needed were the most frequently reported by 8.0% and 5.2% of youth, respectively (Figure 18). There were no major gender or ethnic-specific variations.

Figure 18: Frequency of household problems from someone else’s gambling - all respondents



Associations with gambling participation

Bivariate associations

Data are presented in Appendix 3.

Bivariate associations with being a past-year gambler were examined for various youth socio-demographic and behavioural variables including parental gambling and household problems associated with someone else’s gambling. Mother’s previous gambling risk level in 2014¹⁰ (non-gambler, non-problem gambler, low-risk/moderate-risk/problem gambler) was also examined for association with past-year youth gambling. Note that statistical significance in the bivariate analysis results may not necessarily indicate a true association as the findings might be better explained by confounding variables.

Males had twice the odds for being a gambler (OR 2.04), compared with females.

Substance use was also associated with being a gambler. Ever drinking alcohol (OR 1.67), ever smoking an electronic cigarette (OR 1.81), using a legal high in the past month (OR 2.31) and smoking marijuana in the past month (OR 1.76) were all associated with being a past-year gambler, compared with not using these substances. Smoking cigarettes was not associated with being a gambler. Generally, the more frequent the alcohol drinking and legal high use was, the greater the odds for being a gambler.

Youth who were still at secondary school or who had part-time employment (worked for money/paid job) had greater odds (both OR 1.80) for being a gambler than youth who were no longer at school or who did not have employment.

¹⁰ Mothers were not surveyed when the youth were 17 years old, so data from three years prior were used in the analyses.

Youth who had done things to represent a gang such as spray-painting gang signs or getting into fights, or who had involvement with gangs such as wearing gang colours or using gang signs had greater odds for gambling than youth who were not involved in gangs in this manner (OR 3.15 and 3.14, respectively). Interestingly, actually being a gang member was not associated with higher odds for gambling, although this may be an artefact of the very small sample size. Youth who had family or friends who were gang members had 2.54 times the odds for being a gambler than youth whose family/friends were not involved in gangs.

Although parental gambling per se was not associated with youth gambling, experiencing household problems because of someone else's gambling was associated (OR 2.02).

Further analyses were conducted with the variables detailed in Appendix 3 that had also been collected when the youth were nine years or 14 years of age, to see if they added any new information to gambling at age 17 years. That is, to see whether earlier behaviour predicted later gambling behaviour. No new information was found meaning that there were no other predictors of gambling behaviour when the youth were 17 years old from when they were younger. Thus, these findings have not been presented.

Multiple logistic regression

Multiple logistic regression analyses showed that gender remained significantly associated with being a past year gambler. Males had almost twice the odds (OR 1.80) for gambling, compared with females (Table 14).

Still attending secondary school and ever having smoked an electronic cigarette were also statistically associated with being a gambler (OR 2.62 and 1.69, respectively), compared with having left school and never having smoked an e-cigarette (Table 14).

Environmental factors statistically associated with youth gambling were having gang involvement or having family members or friends who were a member of a gang (OR 2.22 and 1.74, respectively) (Table 14).

Table 14: Multiple logistic regression for being a past-year gambler

Variable	Odds ratio	(95% CI)	p-value
Gender			
Female	1.00		
Male	1.80	(1.18 - 2.74)	0.007
Currently attending secondary school			
No	1.00		
Yes	2.62	(1.31 - 5.21)	0.006
Ever smoked electronic cigarettes			
No	1.00		
Yes	1.69	(1.09 - 2.60)	0.018
Had gang involvement			
No	1.00		
Yes	2.22	(1.36 - 3.62)	0.001
Have family or friends who are gang members			
No	1.00		
Yes	1.74	(1.09 - 2.80)	0.021

DISCUSSION AND CONCLUSION

The Pacific Islands Families (PIF) study is a longitudinal birth cohort study of Pacific participants that aims to investigate interactions with, and influences of, family and the environment on child behavioural development and health outcomes. This longitudinal study provides an ideal opportunity to examine gambling behaviours of Pacific youth and factors influencing gambling behaviour.

In 2017, the PIF youth were 17 years of age; their final year of age restrictions for gambling on non-casino electronic gaming machines, track and sports betting via a Totalisator Agency Board (TAB) venue, and scratch cards, as the age restriction for these activities is 18 years¹¹. The PIF study's longitudinal nature allowed for examination of problem gambling behaviour change over time as the children aged, as well as providing information on risk factors for youth gambling. This is particularly important for two reasons. First, as mentioned in the Background (page 9), compared with European adults, of the minority ethnicities Pacific adults have consistently had the highest risk for developing harmful gambling and although a few, mainly qualitative studies, have identified cultural factors are connected to the development and maintenance of problem gambling behaviours, further research is required. Second, at the age of 17 years it was the final opportunity to collect data from the PIF youth before they were legally allowed to gamble on most activities. Furthermore, an extensive range of health, developmental and familial relationship correlates of gambling has been possible with the PIF study, which due to cost-prohibitive reasons, a stand-alone study would have been unlikely to examine. The PIF study has provided a unique opportunity to directly ask Pacific children/youth about their gambling behaviours, and to analyse gambling behaviours against other internal and external influences.

Data were collected from PIF study youth in 2017 and were compared with data collected in 2014 and 2009, where possible, so that changes over time could be assessed. Generally, the reported trends over time were cross-sectional population level comparisons, not longitudinal analyses where only participants who took part at each time point would be included in the analyses. The exception is for transitions in problem gambling, whereby only those who participated in 2014 and 2017 were included in the analyses. A limitation of the study is that the data were collected via self-report and it is likely that there was some level of recall bias and potential for misinterpretation of the meaning of questions.

Furthermore, the study participants were not necessarily representative of Pacific youth at a national level and, as the data were not weighted, the results only reflect the study sample and not the national Pacific youth population. Nonetheless, the 17 year old participants were relatively similar to the population proportions identified in the 2013 Census. The study participants were 46.5% Samoan, 21.3% Tongan and 15.2% Cook Islands Māori, compared nationally with 49% of Pacific youth aged 15 years to 19 years being Samoan, 20% being Tongan and 22% being Cook Islands Māori (Statistics New Zealand, 2018).

Gambling participation

Almost one-third (31.7%) of the youth had gambled for money in the prior year. This was a substantial increase from three years earlier when the youth were 14 years old, when 18% reported gambling in the prior year. The prevalence of past year gambling amongst the 17 year olds was slightly higher than that reported for Pacific students in the Youth'12 survey of New Zealand secondary school students (26%) (Rossen et al., 2013); however, the latter

¹¹ Note that casino gambling has a higher age restriction of 20 years.

study included youth aged from 13 to 17 years and, as shown from the previous PIF study when the youth were 14 years old, the prevalence of gambling participation increased with age. Additionally, the Youth'12 survey is only of youth who were attending school, whilst 12% of the PIF youth had left secondary school, and this may also have influenced gambling participation rate. In contrast, gambling participation amongst 17 year old Pacific youth was less than half that of adult Pacific gambling. Three-quarters (74.5%) of Pacific adults had gambled in the prior year in the National Gambling Study (Abbott et al., 2014a).

The three most common activities were bets with friends or family, betting on sports matches and betting on card games. This finding was similar to that noted when the youth were 14 years old, although due to differences in question wording and time frames, the percentages are not directly comparable. Thus, early teenage gambling behaviours appear to have been perpetuated into late teen years, with a greater prevalence amongst the older teenagers. The three most commonly reported gambling activities are generally social in that they occur in the presence of other people. However, participation was generally infrequent, occurring monthly or less often. Overall, on average, each gambler participated in two different gambling activities.

Although gender differences were not apparent for many gambling activities, boys appeared to have a preference for activities where there was some element of skill such as gambling on games of marbles and on sports matches, whilst girls were more likely to bet on games of chance such as housie/bingo and Lotto. Although this finding was not noted in the Youth'12 study (Rossen et al., 2013) it is similar to the National Gambling Study, which found that adult males were more likely to bet on sports matches than females, whilst females were more likely to gamble on housie/bingo than males. There were no gender differences in Lotto gambling amongst adults (Abbott et al., 2014a). However, amongst the PIF youth, a greater percentage of boys also gambled on games of dice, than girls, despite the outcome of such games being entirely random. This finding may be related to the camaraderie of socially-oriented gambling as boys were also more likely than girls to gamble on other actions or events that involved other people (e.g. games of pitch and toss).

Frequency of gambling and gambling expenditure

Similar to when the youth were 14 years old, at the age of 17 years gambling generally remained an infrequent activity, occurring less than monthly for more than half of the gamblers for almost all activities. Additionally, almost two-thirds (62.2%) of gamblers reported not usually spending any time each day gambling. However, a substantial minority (37.8%) usually spent some time each day gambling and 1.2% gambled for more than three hours per day. Amongst adults, gambling for three hours or longer on pub or casino EGMs has been shown to be a risk factor for moderate-risk/problem gambling (Abbott et al., 2014b). Whilst not directly comparable, a tendency to regularly gamble for long periods as a youth could be a gateway to more harmful long gambling sessions as an adult.

For two activities, dice gambling and playing games for money on a mobile phone or tablet, a higher prevalence of youth gambled at least monthly with about one-third gambling at least weekly. These two gambling activities were not the most popular, each participated in by about one in ten gamblers, compared with bets with friends or family participated in by almost half the gamblers, and betting on sports matches and card games, both by about one-quarter of the gamblers. This implies that although dice betting and playing games for money on a mobile phone or tablet were only undertaken by a small proportion of youth, those who chose to participate in those activities did so at a higher intensity than for other gambling activities.

Youth who gambled on dice were also more likely to gamble larger amounts of money per week. Betting \$50 or more per week was reported by 10.5% of dice gamblers and along with housie/bingo gamblers at 10%, this was the highest percentage for high weekly expenditure of all the activities. The implication of higher frequency and expenditure on dice gambling by the minority of Pacific youth who participate in this activity is that it could potentially lead to problematic gambling in the future. Boys possibly have a higher risk, as they were more likely to bet on dice than girls. However, this interpretation of findings should be considered cautiously as the sample size was small and variations could be due to artefacts of the small numbers. Additionally, as the results suggest that some youth were reporting usual expenditure *per se*, rather than usual *weekly* expenditure, the higher weekly expenditure on dice gambling may be exaggerated and compounded by the small sample size.

Nonetheless, it was noticeable that dice gambling was the only activity where all of the gamblers reported a weekly expenditure; thus dice gambling was a regular activity for those who participated in it. Conversely, no youth reported spending \$50 or more per week on playing games for money on a mobile phone or tablet.

For all gambling activities apart from Lotto, of those who had a usual weekly expenditure, a majority spent less than \$10 on the activity. For Lotto, only 15.4% reported this level of expenditure, with more than half (53.7%) reporting spending \$10 to \$49 weekly. The reason for this could be the pricing structure of ‘Lucky Dip’ tickets, which range from \$5.60 to \$28, but of the 13 options only two are priced at less than \$10 (prices correct as of October 2018).

Social context of gambling

As occurred when the youth were 14 years old, when they were 17 years old most gambling took place with family or friends, and a low proportion of youth gambled with other people they knew (7.3%). Thus, gambling was a social activity. However, a small minority of youth reported gambling alone (5.2%) or with people they did not know such as strangers met online (0.5%). These latter percentages were not dissimilar to those reported in the Youth’12 study, where 10% of youth aged 17 years and older reported gambling alone, 4.5% with other known people, and 2.5% with strangers (Rossen et al., 2013). In a multiple logistic regression analysis, gambling with other known people (not family or friends) was a risk factor for harmful gambling behaviours (Rossen et al., 2013). Whilst Rossen et al. did not speculate on the reasons for this finding, one reason could be that the other known people the youth gambled with, who were not family or friends, may be less likely to feel ‘protective’ towards the gambler or less cognisant of the gambler’s circumstances and, thus, not as forthcoming in helping the youth to minimise risks and harms from gambling, compared with family or friends. Gambling alone has been shown to be a risk factor for problematic gambling in New Zealand adults (Abbott, 2001b) and may also be so for the small minority of youth who were already gambling in this manner. However, this is mitigated by the fact that participation was generally infrequent, occurring monthly or less often.

Overall, almost half (49.2%) of the youth gambled with family, although boys were more likely to gamble with friends whilst girls were more likely to gamble with family. Nonetheless, the fact that gambling usually occurred with family or friends indicates a level of social cohesiveness. Dickson, Derevensky and Gupta (2008) identified that low family and school cohesiveness was associated with problematic gambling behaviours amongst youth aged 11 years to 19 years. Similarly, Rossen et al. (2016) identified that family connection appeared to be protective against harmful gambling behaviours, although they cautioned that “exposure to adult gambling behaviours and mental health indicators are more critical”. Amongst Samoan adults, the aiga (nuclear and extended family) plays a fundamental role in “gambling

participation, development and maintenance”, with collective (as opposed to individual) gain being a prime consideration (Perese, 2009, p. 227). As ethnic-specific differences were not apparent in regard to the social context of the youth’s gambling, it is likely that nuclear and extended family are important in the introduction and maintenance of gambling behaviours amongst Pacific youth.

One in 19 (5.2%) youth reported gambling alone and a very small percentage (0.5%) gambled with strangers. The former removes gambling from a social activity where there is the potential for other people to encourage mitigating behaviours and removes any external controlling influence that could minimise the potential for excessive gambling behaviour. There could be many reasons for wanting to gamble alone such as escaping from stressful life situations to being bored. Similarly, gambling with unfamiliar people met online could also potentially be problematic as unscrupulous strangers may have no compunction in encouraging excessive gambling behaviour, or may not even be real people, but ‘bots’ designed to maximise losses from a gambler.

Reasons for gambling

Whilst a majority of the youth gambled to have fun, and a substantial minority gambled to win money or for a challenge, a minority gambled for less social reasons. Fifteen percent reported gambling because of boredom, and a small percentage showed indications of harmful gambling behaviours with 3.1% gambling because they were short of money. Gambling due to being short of money could imply that those youth thought that it would be a viable way to make money. This fallacy has been identified previously amongst a sample of Pacific adults in New Zealand (Urale, Bellringer, Landon, & Abbott, 2015) and may indicate intergenerational transmission of the fallacy and gambling behaviours from adults to children. However, to the question ‘Why do you participate in gambling or bet for money?’, some youth may have interpreted the listed responses of ‘To win money’ and ‘Because I am short of money’ similarly. Thus, for them, it was the winning of money that was important, not necessarily because of a *need* to make money. Furthermore, 1% of youth gambled because they could not stop, which implies loss of control and some level of problematic gambling. Nonetheless, these findings were similar to when the youth were 14 years old, indicating that the prevalence of those gambling for harmful reasons had not increased over time. These findings were also similar to those in the Youth’12 study, which found that 1.9% of youth aged 17 years or older gambled because they were short of money and 0.6% of all youth gambled because they couldn’t stop (Rossen et al., 2013).

A reason for gambling reported by a minority of boys (3.3%), but not by girls, was because their friends gamble. This may indicate some level of peer influence and corresponds with the finding that boys were more likely than girls to gamble with friends.

Problem gambling and help-seeking behaviour

Whilst a majority of youth gambled infrequently and non-problematically, a small proportion (1.6%) scored as problem gamblers. This finding was similar to the 2% problem gambler prevalence when the youth were 14 years old. However, there was a gender difference with 2.5% of the 17 year old boys being problem gamblers compared with 0.6% of girls. The most common dimension of the harmful gambling was stealing to spend on gambling, with about one-fifth of the gamblers reporting that they had ever done this. A recent systematic review of 44 studies of youth problem gambling identified that past year problem prevalence ranged from 0.2% to 5.6%, with the variability caused by a multitude of factors including methodological

differences, different screens for problem gambling, and different gambling availability in various countries (Calado, Alexandre & Griffiths, 2017). Nonetheless, the 1.6% prevalence in the present study sits within this range. Calado et al. (2017) also identified that in European countries, males were more likely to be problem gamblers than females, and that older youth had a higher prevalence than younger youth.

The National Gambling Study identified that 1.6% of Pacific adults were classified as problem gamblers, with the prevalence for males and females being 2.0% and 1.3%, respectively (Abbott et al., 2014b). This was higher than the prevalence noted for European/Other adults (0.5%) and similar to the prevalence for Māori (2.3%) (Abbott et al., 2014b). Although the National Gambling Study cannot be directly compared with the current youth study due to different methodologies including the use of different screens for problem gambling measurement, overall it appears that problem gambling prevalence amongst 17 year old Pacific youth is similar to the prevalence for Pacific adults. This is contrary to the assertion by Calado et al. (2017), in their review, that youth have higher problem gambling prevalence than adults, in part because adolescence is a period of risk taking without the constraints of adult roles (e.g. raising a family or being in full time employment). That a difference in prevalence has not been found overall between Pacific youth and adults requires further investigation to ascertain the veracity of the finding and to understand why this might be so for Pacific people. However, when examined by gender there may have been a difference, particularly for 17 year old girls where 0.6% were problem gamblers compared with 1.3% of Pacific female adults in the National Gambling Study.

Two-thirds of the youth problem gamblers reported a level of worry over the time or money they spent on gambling, although a majority of those were only 'a little' worried. Interestingly, a quarter of the non-problem gamblers also reported a level of worry about their gambling, again with a majority of those having only 'a little' worry. Similar proportions (about one-third) of problem gamblers and non-problem gamblers reported that they had ever tried to reduce or quit gambling. This implies that not all problem gamblers who worried over their gambling acted on their concerns by reducing their gambling behaviours, possibly because they thought that 'a little' worry did not merit behaviour change. However, this does not preclude the fact that they may have sought help for their gambling (see below).

Overall, of the youth gamblers, 27.8% reported some level of worry about the amount of time or money they spent gambling. This is not dissimilar to the 36% of Pacific gambler students in the Youth'12 study who reported some worry over gambling (Rossen et al., 2013). Rossen et al. (2013) also found that a lower percentage of older students (17 years and older) were worried about their gambling compared with younger students (13 years and younger) (12% and 22%, respectively for all gambler students).

One in five (19.9%) youth had sought help for their gambling. Amongst youth gamblers, almost two-thirds (65.3%) had sought help; this was the same proportion that reported a level of worry over the time or money they spent gambling. This is an interesting finding in the context of almost three-quarters (71.5%) of youth gamblers gambling to have fun. Whether the high level of help-seeking was because the gambling stopped being fun is outside the scope of this research but warrants future attention. Whilst a majority of help-seeking gamblers only accessed one source of help, almost one in ten (9.4%) sought help from multiple sources, with the most common source being friends. Before being asked about actual help-seeking behaviour, the youth were asked to report from where/whom they thought they would seek help if they had problems or worries with their gambling. It was apparent that whilst youth *thought* they would seek help from trusted adults such as parents, school guidance counsellors or other family members, when help was *actually* required, they turned to friends and other sources of help, on the whole avoiding adults. This actual versus potential behaviour was not further

investigated but is worthy of future study as it could help to shed light on why, in general, seeking help for gambling problems is undertaken by only a minority of adults. In the National Gambling Study, only one percent of adults reported ever seeking help to reduce or stop gambling (Abbott et al., 2014b), a substantially lower percentage than the 19.9% of youth in the current study. It could be, for example, that whilst a young person thinks they could tell a trusted adult their potential problems, when the problems are a reality, the shame or stigma of admitting to a gambling problem, or fear of being judged or punished could be barriers to seeking help from those sources. Shame was identified as a barrier to seeking help for gambling problems in an earlier study of the impact of gambling on Pacific families and communities (Bellringer et al., 2013). Such fears in youth could persist into adulthood.

Buying and receiving Instant Kiwi tickets

One in 31 (3.2%) of all youth, and one in nine (10.6%) of the gamblers, reported having played for money on Instant Kiwi in the prior year. In the Youth'12 survey of New Zealand secondary school students, 10.5% of all 17 year old (and older) students reported buying Instant Kiwi tickets (Rossen et al., 2013); thus it appears that a lower prevalence of Pacific youth may be purchasing Instant Kiwi tickets, compared with all youth. Instant Kiwi has an age restriction of 18 years (Gambling Act 2003, Section 301) because regular participation in this activity has the potential for increased risk of harmful gambling. The study finding could mean several things. The youth could be breaking the law by buying tickets whilst under-age; however, they may be unaware of the law rather than deliberately flouting it. Retailers are breaking the law if they sell a ticket to an underage person. However, it could be that some of the youth were actually 18 years old at the time of the survey, for example, if they had just had a birthday and, in such cases, purchase of Instant Kiwi tickets would not be illegal. Nonetheless, the New Zealand National Gambling Study reported that Instant Kiwi is a significant risk factor for problem gambling amongst adults (Abbott et al., 2014b).

When the youth were 14 years old, 7% reported ever having been given an Instant Kiwi or other scratch ticket as a present. At the age of 17 years, 2.3% of all youth and 4.9% of the gamblers reported that they had received Instant Kiwi ticket/s as a gift in the prior year. When adults give scratch tickets to children/youth, this promotes this type of gambling as a fun and harmless family activity. These findings highlight that more education and public health awareness around the potential harms of this seemingly innocuous gambling activity are required, along with increased harm minimisation training for retailers of instant scratch tickets.

Gambling transitions

The National Gambling Study showed that transitioning into and out of problematic gambling is common amongst adults (Abbott et al., 2018). It appears that the situation is similar for youth. When aged 14 years, there were 12 problem gamblers of which three remained problem gamblers when aged 17 years; the other nine became non-problem gamblers. Conversely, seven of the 10 problem gamblers amongst 17 year old youth had been non-problem gamblers three years earlier.

A three-phase longitudinal study of 305 youth in the United States of America, spanning eight years from when the youth were aged 16 years to 24 years found that fluctuations in gambling and problem gambling behaviour were common (Winters, Stinchfield, Botzet & Slutske, 2005). The authors noted that only four percent of participants were at-risk or problem gamblers at all three time points, 21% became at-risk or problem gamblers and 13% transitioned from problematic states to non-problematic states (Winters et al., 2005). More recent longitudinal

studies of youth gambling (rather than problematic gambling) conducted in Australia similarly reported little stability in gambling behaviour over time and concluded that gambling when aged 15 to 16 years was generally not associated with early adulthood gambling (aged 20 to 21 years) (Delfabbro, King & Griffiths, 2014) but that gambling in late adolescence was associated with adult gambling (Delfabbro, Winefield & Anderson, 2009).

Further research with the PIF cohort is required to assess whether problem gambling in Pacific youth is a precursor to problematic or risky gambling in adulthood, along with the role of relapse, help-seeking behaviours and natural recovery.

Gambling participation versus substance use

Participation in gambling activities (31.7%) in the prior year was as common as ever smoking cigarettes (37.1%), e-cigarettes (36.5%) and marijuana (29.1%) amongst the 17 year old youth. However, it was less prevalent than ever having consumed alcohol (72.6%). These findings are similar to the Youth'12 study for alcohol consumption, which reported that 69.2% of 17 year olds currently drank alcohol. However, the Pacific youth in the current study appeared to be more likely to have smoked cigarettes and marijuana compared with all youth in the Youth'12 study (15% and 20.2%, respectively) (Adolescent Health Research group, 2013). The Youth'12 report does not detail findings by ethnicity; however, the earlier Youth'07 survey reported that rates of weekly cigarette and marijuana smoking were higher for Pacific students compared with European students (Helu, Robinson, Grant, Herd & Denny, 2009), indicating that the findings from the current PIF study are not unexpected. Caution should, nevertheless, be exercised in interpreting these findings as direct comparisons are not possible. The current PIF study measured lifetime substance use ('have you ever'), whilst the Youth'12 study measured current use, being those who reported continued use after the first occasion.

Nonetheless, these findings indicate that participation in, and trying out, risky behaviours occurs for a substantial minority (a majority for alcohol) of the youth. Although not directly comparable, it appears that whilst gambling was more favoured at age 14 years, this was superseded by alcohol consumption three years later. As mentioned by Calado et al. (2017) in their review, being a youth is a period characterised by general risk-taking behaviours, and it would seem that the youth in the present study are no exception.

Other people's gambling

More than half (58.8%) of the youth reported that their parents or caregivers gambled with Lotto being the most common activity; the other activities included housie/bingo, Instant Kiwi, casino gambling, and track and sports betting. It is likely that this is an underestimate since youth may not always have been aware of parental/caregiver gambling. Nonetheless, gambling was a common behaviour in a majority of the youth's households. One-fifth of all youth reported worrying or feeling anxious about how much money or time their family members spent gambling, and one in nine youth reported experiencing at least one household problem from a family member's gambling, albeit in general, the problems were experienced rarely or more than a year ago.

Whilst the proportion of parents/caregivers who gambled was similarly noted in the Youth'12 study, it is noteworthy that only 8% of students aged 17 years and older reported feeling worried or anxious about the level of gambling within their family and 5% or fewer reported each of the negative effects (Rossen et al., 2013). This suggests that although the proportion of families gambling in the present study was on a par with that of the Youth'12 study, the intensity of

gambling may have been greater amongst the Pacific families, leading to more negative effects on the youth and more anxiety experienced by the youth. This could have longer-term consequences for wellbeing and general mental health as well as on future behaviours in regard to gambling. Another reason for the higher proportion of PIF youth who experienced negative effects from another's gambling, compared with the Youth'12 sample, may be the collective family and community orientation of Pacific people compared with the individualistic orientation of Western populations. Thus, more people might be affected by a single Pacific person's gambling. It is also worth considering recent Australian and New Zealand research indicating that harms from gambling are not confined to people defined as 'problem gamblers' but are also experienced by moderate-risk and low-risk gamblers, albeit to a lesser extent (Browne et al., 2017a, 2017b; Rawat et al., 2018).

Associations with gambling participation

Bivariate logistic regression analyses were conducted to assess for association with gambling behaviour. Variables examined included demographics, substance use, general health and suicidality, amount of time spent online, delinquent behaviours such as bullying and gang affiliations, being at school, having paid employment, parental gambling, household problems because of someone else's gambling, and mother's gambling risk level when the youth were 14 years old. This was followed by multiple logistic regression modelling.

These analyses found that male gender, still attending secondary school, ever having smoked an electronic cigarette, having gang involvement and having family members or friends who were gang members were all significantly associated with gambling at age 17 years.

As previously mentioned, it is known that male youth, at least in European countries, have a higher risk for being problem gamblers than female youth. In the present study, the sample of problem gamblers was too small for statistical analysis; however, 17 year old boys had almost twice the odds for being past year gamblers than girls. This result was not found when the youth were 14 years old. Several studies have identified that male youth have a higher propensity to gamble than female youth (see Rossen et al., 2013 for a review) so the findings from the present study are expected. One explanation is that the gender difference may be related to the social context of the youth gambling; boys were more likely to gamble with friends whilst girls were more likely to gamble with family members. Gambling with friends could lead to peer pressure to engage in betting behaviours. However, as adults there is no difference in past-year gambling prevalence between male and female Pacific people (Abbott et al., 2014a).

Youth who were still at school had almost three times the odds for past year gambling than their counterparts who had left school. This may be related to availability of both disposable money and time, or may be related to more time spent with peers. Youth who are not at school may be unemployed and thus not have disposable money for gambling or other activities. Conversely, youth who have left school and are employed may not have time to engage in gambling activities and have less time to engage with peers. These reasons are hypothetical and further research is required to understand the relationship between attending school and gambling.

Ever having smoked an electronic cigarette was associated with past year gambling, whilst other substance use including conventional cigarette smoking was not associated. Although it is illegal for products containing tobacco to be sold to anyone aged less than 18 years (Smoke-free Environments Act 1990), nicotine containing e-cigarettes are readily accessible via the internet or through illegal local sales (Ministry of Health, 2017). Non-nicotine e-cigarettes are

more widely available. The reason for an association between gambling and e-cigarettes, but not traditional cigarettes, is currently unknown and requires further investigation. However, it is possible that it is related to the novelty of the former. Data from the 2014 Health and Lifestyles Survey found that a fifth of young people aged 15 years to 17 years had ever tried an e-cigarette and, overall, amongst all adults, more than half (57.1%) tried an e-cigarette out of curiosity (Li, Newcombe & Walton, 2015). Trying things out of curiosity requires some level of risk-taking and as gambling is inherently a risky activity, it could be that youth with a higher propensity for risky behaviours would be more likely to both gamble and try e-cigarettes. This hypothesis remains to be tested.

The most significant of the associations with gambling were having gang involvement and having family members or friends who were gang members. Being involved in a gang had also been found to be associated with gambling participation not only when the youth were 14 years old but when they were nine years old (Bellringer et al., 2012) meaning that this association has persisted as the children aged through early and then late teenage years. The finding that having family or friends in gangs was also associated with gambling when the youth were 17 years old further strengthens the gang-gambling relationship. In New Zealand, gang affiliation is more prevalent among Pacific youth than those of other ethnicities (Mila-Schaaf et al. 2008), with many youth becoming gang-affiliated because their family is involved with gangs, to have the friendship and protection of being in a gang, or because they feel isolated from their families and the gang becomes their family (Nakhid, Tanielu & Collins, 2009). Similarly, Melde & Esbensen (2011) in a school-based study of children from 15 schools in the United States of America concluded that joining youth gangs (amongst other variables) is associated with reduced informal social controls (e.g. parental monitoring), and a review of research found that poor parental monitoring or supervision were the only two reliable predicting factors for youth affiliating with gangs (Klein & Maxson, 2006 cited in O'Brien, Dafferen, Chu & Thomas, 2013). The relationship between youth gang involvement and gambling has not been researched; however, international research has shown that delinquent behaviour, including gang activity, is a risk factor for problem gambling in youth (see e.g. Brown, Killian & Evans, 2005; Cheung 2014; Cook et al., 2015).

Conclusion

About one in three 17 year old Pacific youth are current gamblers, meaning that they have gambled on at least one activity in the prior year. However, for most youth, gambling is a relatively infrequent and generally social activity, taking place with other people such as family and friends. The prevalence of past year gambling is on a par with ever having tried other potentially risky activities such as smoking cigarettes, e-cigarettes and marijuana. However, it is less than the prevalence of ever having consumed alcohol, reported by three out of four youth. These findings are expected as experimentation in risky behaviours is a normal part of 'growing up' for youth.

Gambling appeared to be a common activity in families as more than half of the youth reported parental gambling. Lotto was the most cited activity. However, one in five youth were worried about the level of gambling occurring in their household and one in nine youth had experienced at least one household problem from that gambling. The consequences of this could be adverse short- and long-term effects on the youths' wellbeing and mental health, potentially affecting academic performance and subsequent healthy functioning as adults. Furthermore, one in 43 youth had been given an Instant Kiwi ticket in the prior year, and one in 31 had bought a ticket, despite this being against the law. Similar findings had been noted when the youth were nine and 14 years of age indicating that over those eight years, the age restriction on instant scratch tickets remained unknown, not understood or flouted, not only by the PIF families but

potentially also by retailers. Further education and understanding around the risk of such continuous forms of gambling clearly remains important.

The prevalence of problem gambling amongst the youth was on a par with that of Pacific adults, with one in 63 youths meeting the problem criteria. One in 21 youths who gambled were problem gamblers. Boys had a higher risk compared with girls. Additionally, one in five gamblers had stolen money to spend on gambling, and some youth gambled to try and win needed money or because they could not stop. These youth were thus already experiencing some level of harm from their gambling behaviours. Additional gambling behaviours indicative of increased risk of harm included gambling alone or with strangers, daily gambling and gambling for long periods of time (e.g. three or more hours per day). In particular, betting on dice games and playing games for money on a mobile phone or tablet appeared to be more intensive (more frequent with higher expenditure) than betting on other gambling activities, meaning that these two activities may have a higher risk for causing harm. Since dice betting is not a common activity amongst adults, this activity amongst the youth is unlikely to continue. However, playing games for money on a mobile phone or tablet is an activity frequently undertaken by adults and there is potential for these risky adolescent behaviours to continue into adulthood leading to potential harmful gambling.

This study identified that whilst youth thought that they would confide in a trusted adult if they had gambling problems, if they actually had problems, they were more likely to avoid adults, preferring peers or other unknown means of accessing help. The reason for this difference between intended and actual behaviour is currently unknown but underscores the importance of identifying barriers to help-seeking by Pacific people for gambling problems and may require an extensive and consistent campaign to destigmatise the shame associated with the 'problem gambler' label. It also indicates that public health, prevention and awareness approaches are required to support and empower Pacific youth and peers to provide adequate responses and act as catalysts and supports for behavioural change.

The most consistent finding from when the youth were nine years old, through 14 years to 17 years was the association between gang involvement and gambling. When considered with the finding that having family members or friends who were gang members also was associated with youth gambling, this finding warrants further attention. This is particularly important since many youth become gang-affiliated because their family is involved with gangs. The fact that youth gang membership is associated with poor parental monitoring or supervision also highlights the importance of family-based health promotion activities to increase resilience and provide resources and assistance for optimal parenting.

Thus, gambling in families together with harmful and risky behaviour by a significant minority of youth, highlights a necessity for relevant and tailored information, education and public health resources to support Pacific families and minimise potential harms from gambling. Additionally, the relationship between gang involvement and gambling merits further research, especially as gang involvement is more prevalent amongst Pacific youth than other ethnicities. The consistent propensity for gang involvement to be associated with gambling behaviour amongst youth increases the potential for a higher prevalence of problematic gambling amongst the same people in later years when they are adults. Although this study is unable to identify causal relationships, the results from this study, interpreted in conjunction with the findings from when the PIF youth were nine and 14 years old, paint a picture of important aspects to be considered for the implementation of policies and practices to minimise the risks for Pacific people and to reduce the development of harmful gambling behaviours.

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APPENDIX 1: GAMBLING-RELATED QUESTIONS

Gambling behaviour

1. In the past 12 months have you bet/played for money on.....?
 - 1.1. Game of marbles? (Yes/No)
 - 1.1.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
 - 1.1.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)
 - 1.2. Board game? (Yes/No)
 - 1.2.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
 - 1.2.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)
 - 1.3. Card game? (Yes/No)
 - 1.3.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
 - 1.3.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)
 - 1.4. Sports match? (Yes/No)
 - 1.4.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
 - 1.4.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)
 - 1.5. Playing dice? (Yes/No)
 - 1.5.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
 - 1.5.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)

- 1.6. Housie/bingo? (Yes/No)
- 1.6.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
- 1.6.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)
- 1.7. Lotto (including Strike and Powerball)? (Yes/No)
- 1.7.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
- 1.7.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)
- 1.8. Keno? (Yes/No)
- 1.8.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
- 1.8.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)
- 1.9. Instant Kiwi (scratchies)? (Yes/No)
- 1.9.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
- 1.9.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)
- 1.10. Games on a mobile phone/tablet (e.g. text games)? (Yes/No)
- 1.10.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
- 1.10.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)
- 1.11. Internet gambling (e.g. internet casinos or poker)? (Yes/No)
- 1.11.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
- 1.11.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)

- 1.12. Bets with friends or family? (Yes/No)
 - 1.12.1. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
 - 1.12.2. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)

- 1.13. Any other form of gambling? (Yes/No)
 - 1.13.1. Please say what this is.....
 - 1.13.2. If Yes, how much money would you usually spend each week?
(Nothing / Less than \$10 / \$10 - \$19 / \$20 - \$29 / \$30 - \$49 / \$50 or more)
 - 1.13.3. How often do you take part in this activity?
(Once or twice in the past 12 months / Once in the last 4 weeks / Two or three times in the last 4 weeks / About once a week / Several times a week / Most days)

- 2. Thinking about the sorts of gambling activities just mentioned, which is the gambling activity that you most prefer? (Options as in 1.1 to 1.13)

- 3. How much time would you usually spend each day on bets or gambling?
 - a) Nothing
 - b) Less than 15 minutes
 - c) 15 - 29 minutes
 - d) 30 - 59 minutes
 - e) 1 - 3 hours
 - f) More than 3 hours

- 4. When you do these activities or gamble, who do you usually do it with? (Choose as many as you need)
 - a) Friends
 - b) Family
 - c) Other people I know
 - d) Other people I don't know (e.g. people online)
 - e) By myself

All YES/NO response

Concerns about gambling and help-seeking behaviour

- 5. Are you worried about how much time or money you spend on these activities or gambling?
 - a) A lot
 - b) Some
 - c) A little
 - d) Not at all

6. Have you ever tried to cut down or give up gambling or any of these activities?

YES/NO response

7. If you had problems or concerns because of your gambling, who would you go to for help?
(Choose as many as you need)?

- a) School guidance counsellor
- b) Friends
- c) Teachers
- d) Parents
- e) Other family members (e.g. grandparent, aunts, uncles, cousins)
- f) School nurse
- g) Family doctor
- h) Gambling helpline
- i) Pharmacy/chemist shop
- j) Other
- k) I wouldn't look for help

All YES/NO response

8. And in the past year have you been to any of these people for help because of your gambling?
(Choose as many as you need)?

- 1.A School guidance counsellor
- 2.A Friends
- 3.A Teachers
- 4.A Parents
- 5.A Other family members (e.g. grandparent, aunts, uncles, cousins)
- 6.A School nurse
- 7.A Family doctor
- 8.A Gambling helpline
- 9.A Pharmacy/chemist shop
- 10.A Other

All YES/NO response

9. In the past year have you received an Instant Kiwi or scratch ticket as a present?

YES/NO response

DSM-IV-MR-J Screen

10. In the past year, how often have you found yourself thinking about gambling or planning to gamble?
Never Once or Twice Sometimes Often
11. During the course of the past year, have you needed to gamble with more and more money to get the amount of excitement you want?
Yes No
12. In the past year, have you ever spent much more than you planned to on gambling?
Never Once or Twice Sometimes Often
13. In the past year, have you felt bad or fed up when trying to cut down or stop gambling?
Never Once or Twice Sometimes Often Never Tried to cut down
14. In the past year, how often have you gambled to help you escape from problems or when you are feeling bad?
Never Once or Twice Sometimes Often
15. In the past year, after losing money gambling, have you returned another day to try and win back money you lost?
Never Less than half the Time More than half the time Every time
16. In the past year, has your gambling ever led to lies to your family?
Never Once or Twice Sometimes Often
17. In the past year, have you ever taken money from the following without permission to spend on gambling:
- | | Never | Once or twice | Sometimes | Often |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| a. School lunch money or bus fare money? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Money from your family? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Money from outside the family? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
18. In the past year, has your gambling ever led to :
- | | Never | Once or twice | Sometimes | Often |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Arguments with family/friends or others? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Missing school? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Reason for gambling

19. Why do you participate in gambling or bet for money? (Choose as many as you need)
- a) To have fun
 - b) To win money
 - c) Because I am bored
 - d) To relax
 - e) To feel better about myself
 - f) To forget about things

- g) Because my friends do
- h) Because my family does
- i) For a challenge
- j) Because I can't stop
- k) Because I am short of money
- l) To get a buzz
- m) Because I am lonely
- n) None of these

All YES/NO response

Other people's gambling

20. Which of the following activities do your parent/s or caregiver/s play or do? (You may choose as many as you need)

- a) Instant Kiwi (scratchies)
- b) Lotto (including Strike and Powerball)
- c) Housie/bingo
- d) Pub or club pokies
- e) Casino (e.g. roulette, pokies)
- f) TAB betting (e.g. on track racing or sports)
- g) Games on a mobile phone/tablet (e.g. text games)
- h) Internet gambling (e.g. internet casinos or poker)
- i) Bets with friends or family
- j) 0900 phone games
- k) Cards games (e.g. poker)
- l) None of these

All YES/NO response

21. Do you ever worry or feel anxious about how much money or time other people you live with (parents and family), spend on gambling or any of these activities?

- a) Yes, all of the time
- b) Yes, now and then
- c) No, hardly ever
- d) No, never
- e) I don't know

22. How many times have these things happened in your family because of someone else's gambling?

20.1. Had arguments or fights about time or money spent on betting or gambling
(Never / Not in the last 12 months / Once or twice in the last 12 months / three or more times in the last 12 months)

20.2. We had to go without something we needed (e.g. food) because too much money was spent on gambling or betting

(Never / Not in the last 12 months / Once or twice in the last 12 months / three or more times in the last 12 months)

20.3. Some bills weren't paid because too much money was spent on gambling or betting
(Never / Not in the last 12 months / Once or twice in the last 12 months / three or more times in the last 12 months)

20.4. A family member did things that could have got them into serious trouble
(e.g. stealing) because of gambling
(Never / Not in the last 12 months / Once or twice in the last 12 months / three or more times in the last 12 months)

APPENDIX 2: CO-EXISTING ISSUES AND BEHAVIOURS

Behaviour	All youth			Gamblers		
	n	%	(95% CI)	n	%	(95% CI)
Ever drunk alcohol						
No	169	27.4	(24.0 - 31.1)	40	21.1	(15.8 - 27.4)
Yes	447	72.6	(68.9 - 76.0)	150	78.9	(72.6 - 84.2)
Past month alcohol consumption						
Not in past 30 days	215	51.2	(46.4 - 56.0)	63	44.7	(36.7 - 53.0)
1 - 3 times monthly	145	34.5	(30.1 - 39.2)	54	38.3	(30.6 - 46.6)
At least weekly	60	14.3	(11.2 - 18.0)	24	17.0	(11.7 - 24.2)
Past month binge drinking						
Not in past 30 days	348	69.9	(65.7 - 73.8)	106	66.3	(58.6 - 73.2)
1 - 3 times monthly	96	19.3	(16.0 - 23.0)	30	18.8	(13.4 - 25.6)
At least weekly	54	10.8	(8.4 - 13.9)	24	15.0	(10.2 - 21.4)
Ever smoked a cigarette, even a few puffs						
No	387	62.9	(59.0 - 66.7)	111	59.4	(52.2 - 66.2)
Yes	228	37.1	(33.3 - 41.0)	76	40.6	(33.8 - 47.8)
Age when first tried a cigarette						
≤ 12 years	58	26.4	(20.9 - 32.6)	24	32.4	(22.8 - 43.9)
13 - 15 years	94	42.7	(36.3 - 49.4)	30	40.5	(30.0 - 52.1)
≥ 16 years	68	30.9	(25.1 - 37.4)	20	27.0	(18.1 - 38.3)
Ever tried electronic cigarettes						
No	381	63.5	(59.6 - 67.3)	98	54.1	(46.8 - 61.3)
Yes	219	36.5	(32.7 - 40.4)	83	45.9	(38.7 - 53.2)
Ever used a legal high						
No	461	82.9	(79.5 - 85.8)	123	73.7	(66.4 - 79.8)
Yes	95	17.1	(14.2 - 20.5)	44	26.3	(20.2 - 33.6)
Past month legal high use						
Never used legal high	461	82.9	(79.5 - 85.8)	123	73.7	(66.4 - 79.8)
Not in past 30 days	46	8.3	(6.2 - 10.9)	21	12.6	(8.3 - 18.5)
1 - 3 times monthly	34	6.1	(4.4 - 8.4)	15	9.0	(5.5 - 14.4)
At least weekly	15	2.7	(1.6 - 4.4)	8	4.8	(2.4 - 9.3)
Ever smoked marijuana						
No	402	70.9	(67.0 - 74.5)	108	63.2	(55.7 - 70.1)
Yes	165	29.1	(25.5 - 33.0)	63	36.8	(29.9 - 44.3)
Past month marijuana use						
Never smoked marijuana	402	70.9	(67.0 - 74.5)	108	63.2	(55.7 - 70.1)
Not in past 30 days	78	13.8	(11.2 - 16.9)	31	18.1	(13.0 - 24.6)
1 - 3 times monthly	52	9.2	(7.1 - 11.8)	18	10.5	(6.7 - 16.1)
At least weekly	35	6.2	(4.5 - 8.5)	14	8.2	(4.9 - 13.4)
General health						
Excellent	76	12.5	(10.1 - 15.4)	22	11.5	(7.7 - 16.9)
Very good	156	25.7	(22.3 - 29.3)	47	24.6	(19.0 - 31.2)
Good	200	32.9	(29.3 - 36.7)	68	35.6	(29.1 - 42.7)
Fair	132	21.7	(18.6 - 25.2)	41	21.5	(16.2 - 27.9)
Poor	44	7.2	(5.4 - 9.6)	13	6.8	(4.0 - 11.4)
Seriously thought about attempting suicide in past year						
No	484	78.6	(75.1 - 81.6)	143	75.3	(68.6 - 80.9)
Yes	132	21.4	(18.4 - 24.9)	47	24.7	(19.1 - 31.4)
Made a suicide plan in past year						
No	521	85.0	(81.9 - 87.6)	153	81.0	(74.7 - 85.9)
Yes	92	15.0	(12.4 - 18.1)	36	19.0	(14.1 - 25.3)

Behaviour	All youth			Gamblers		
	n	%	(95% CI)	n	%	(95% CI)
Attempted suicide in past year						
No	553	90.1	(87.4 - 92.2)	163	86.7	(81.0 - 90.9)
Yes	61	9.9	(7.8 - 12.6)	25	13.3	(9.1 - 19.0)
Average time spent online						
≤ 2 hours	152	25.6	(22.2 - 29.3)	41	22.4	(16.9 - 29.0)
3 - 4 hours	199	33.5	(29.8 - 37.4)	65	35.5	(28.9 - 42.7)
5 - 6 hours	123	20.7	(17.6 - 24.2)	44	24.0	(18.4 - 30.8)
≥ 7 hours	120	20.2	(17.2 - 23.6)	33	18.0	(13.1 - 24.3)
Frequency of gaming online						
Less than once a week	199	31.4	(27.9 - 35.1)	52	26.9	(21.1 - 33.7)
About once a week	133	21.0	(18.0 - 24.3)	42	21.8	(16.5 - 28.2)
Several times a week	135	21.3	(18.3 - 24.7)	48	24.9	(19.3 - 31.5)
Every day or almost every day	101	15.9	(13.3 - 19.0)	37	19.2	(14.2 - 25.4)
Pass / Don't know	66	10.4	(8.3 - 13.0)	14	7.3	(4.3 - 11.9)
Frequency of Emailing						
Less than once a week	173	27.3	(24.0 - 30.9)	55	28.5	(22.6 - 35.3)
About once a week	154	24.3	(21.1 - 27.8)	42	21.8	(16.5 - 28.2)
Several times a week	148	23.3	(20.2 - 26.8)	53	27.5	(21.6 - 34.2)
Every day or almost every day	66	10.4	(8.3 - 13.0)	15	7.8	(4.7 - 12.5)
Pass / Don't know	93	14.7	(12.1 - 17.7)	28	14.5	(10.2 - 20.2)
Frequency of chatting in a chat room online						
Less than once a week	162	25.6	(22.3 - 29.1)	45	23.3	(17.9 - 29.8)
About once a week	86	13.6	(11.1 - 16.5)	27	14.0	(9.8 - 19.6)
Several times a week	145	22.9	(19.8 - 26.3)	52	26.9	(21.1 - 33.7)
Every day or almost every day	138	21.8	(18.7 - 25.2)	47	24.4	(18.8 - 30.9)
Pass / Don't know	103	16.2	(13.6 - 19.3)	22	11.4	(7.6 - 16.7)
Frequency of instant messaging						
Less than once a week	48	7.6	(5.7 - 9.9)	15	7.8	(4.7 - 12.5)
About once a week	66	10.4	(8.3 - 13.0)	20	10.4	(6.8 - 15.5)
Several times a week	171	27.0	(23.7 - 30.6)	52	26.9	(21.1 - 33.7)
Every day or almost every day	301	47.5	(43.6 - 51.4)	93	48.2	(41.2 - 55.2)
Pass / Don't know	48	7.6	(5.7 - 9.9)	13	6.7	(3.9 - 11.3)
Been bullied online in past two months						
No	497	91.0	(88.3 - 93.2)	151	89.3	(83.7 - 93.2)
Yes	49	9.0	(6.8 - 11.7)	18	10.7	(6.8 - 16.3)
Bullied others online in past two months						
No	502	93.1	(90.7 - 95.0)	153	91.1	(85.7 - 94.6)
Yes	37	6.9	(5.0 - 9.3)	15	8.9	(5.4 - 14.3)
Have family or friends who are gang members						
No	205	39.0	(35.0 - 43.3)	44	25.4	(19.5 - 32.5)
Yes	320	61.0	(56.7 - 65.0)	129	74.6	(67.5 - 80.5)
Had gang involvement						
No	453	77.3	(73.7 - 80.5)	111	62.0	(54.7 - 68.8)
Yes	133	22.7	(19.5 - 26.3)	68	38.0	(31.2 - 45.3)
Done things to represent a gang						
No	531	88.4	(85.5 - 90.7)	141	79.2	(72.6 - 84.6)
Yes	70	11.6	(9.3 - 14.5)	37	20.8	(15.4 - 27.4)
A gang member						
No	589	97.0	(95.3 - 98.1)	177	95.7	(91.6 - 97.8)
Yes	18	3.0	(1.9 - 4.7)	8	4.3	(2.2 - 8.4)

APPENDIX 3: BIVARIATE ASSOCIATIONS WITH BEING A PAST YEAR GAMBLER

Characteristic	n	(%)	OR	(95% CI)	p-value
Gender					
Female	293	(23.9)	1.00		
Male	315	(39.0)	2.04	(1.44 - 2.90)	<0.001
Ethnicity					
Samoan	278	(34.5)	1.00		
Tongan	129	(24.8)	0.63	(0.39 - 1.00)	0.051
Cook Islands Māori	90	(28.9)	0.77	(0.46 - 1.30)	0.32
Other [†]	83	(34.9)	1.02	(0.61 - 1.71)	0.95
Ever drunk alcohol					
No	164	(24.4)	1.00		
Yes	429	(35.0)	1.67	(1.11 - 2.51)	0.01
Frequency of alcohol consumption					
Have not drunk alcohol	164	(24.4)	1.00		
Not in past 30 days	210	(30.0)	1.33	(0.84 - 2.11)	0.23
1 - 3 times monthly	137	(39.4)	2.02	(1.23 - 3.31)	0.01
At least weekly	57	(42.1)	2.26	(1.19 - 4.26)	0.01
Ever smoked a cigarette, even a few puffs					
No	379	(29.3)	1.00		
Yes	215	(35.3)	1.32	(0.92 - 1.89)	0.13
Ever tried electronic cigarettes					
No	372	(26.3)	1.00		
Yes	211	(39.3)	1.81	(1.26 - 2.60)	0.001
Ever used a legal high					
No	446	(27.6)	1.00		
Yes	94	(46.8)	2.31	(1.46 - 3.65)	<0.001
Past month legal high use					
Never used legal high	446	(27.6)	1.00		
Not in past 30 days	45	(46.7)	2.30	(1.23 - 4.29)	0.01
1 - 3 times monthly	34	(44.1)	2.07	(1.02 - 4.22)	0.04
At least weekly	15	(53.3)	3.00	(1.06 - 8.48)	0.04
Ever smoked marijuana					
No	392	(27.6)	1.00		
Yes	157	(40.1)	1.76	(1.19 - 2.60)	0.004
Past month marijuana use					
Never smoked marijuana	392	(27.6)	1.00		
Not in past 30 days	76	(40.8)	1.81	(1.09 - 3.02)	0.02
1 - 3 times monthly	48	(37.5)	1.58	(0.84 - 2.95)	0.15
At least weekly	33	(42.4)	1.94	(0.94 - 4.01)	0.08
General health					
Excellent	74	(29.7)	0.77	(0.43 - 1.37)	0.37
Very good	151	(31.1)	0.82	(0.52 - 1.29)	0.39
Good	191	(35.6)	1.00		
Fair	128	(32.0)	0.85	(0.53 - 1.37)	0.51
Poor	43	(30.2)	0.78	(0.38 - 1.61)	0.51
Seriously thought about attempting suicide in past year					
No	467	(30.6)	1.00		
Yes	127	(37.0)	1.33	(0.88 - 2.01)	0.17

Characteristic	n	(%)	OR	(95% CI)	p-value
Made a suicide plan in past year					
No	501	(30.5)	1.00		
Yes	90	(40.0)	1.52	(0.95 - 2.41)	0.08
Attempted suicide in past year					
No	532	(30.6)	1.00		
Yes	60	(41.7)	1.62	(0.94 - 2.79)	0.09
Average hours per day online					
Less than 2 hours	144	(28.5)	1.00		
3 - 4 hours	193	(33.7)	1.28	(0.80 - 2.04)	0.31
5 - 6 hours	118	(37.3)	1.49	(0.89 - 2.52)	0.13
7 or more hours	117	(28.2)	0.99	(0.57 - 1.70)	0.96
Been bullied online in past two months					
No	475	(31.8)	1.00		
Yes	48	(37.5)	1.29	(0.69 - 2.39)	0.42
Bullied others online in past two months					
No	483	(31.7)	1.00		
Yes	35	(42.9)	1.62	(0.80 - 3.25)	0.18
Have family or friends who are gang members					
No	200	(22.0)	1.00		
Yes	309	(41.7)	2.54	(1.69 - 3.81)	<0.001
Had gang involvement					
No	435	25.5	1.00		
Yes	131	51.9	3.15	(2.10 - 4.73)	<0.001
Done things to represent a gang					
No	512	27.5	1.00		
Yes	68	54.4	3.14	(1.87 - 5.27)	<0.001
A gang member					
No	569	31.1	1.00		
Yes	18	44.4	1.77	(0.69 - 4.58)	0.24
Currently attending secondary school					
No	74	(21.6)	1.00		
Yes	534	(33.1)	1.80	(1.00 - 3.22)	0.049
Worked for money or had a paid job in past year					
No	385	(27.0)	1.00		
Yes	223	(39.9)	1.80	(1.26 - 2.55)	0.001
Parental gambling					
No	246	(28.9)	1.00		
Yes	362	(33.7)	1.25	(0.88 - 1.78)	0.21
Household problem associated with someone else's gambling					
No	541	(29.9)	1.00		
Yes	67	(46.3)	2.02	(1.20 - 3.37)	0.01
Mother's gambling risk level in 2014					
Non-gambler	270	(30.0)	1.00		
Non-problem gambler	262	(34.4)	1.22	(0.85 - 1.76)	0.28
Low-risk/moderate-risk/problem gambler	76	(28.9)	0.95	(0.54 - 1.67)	0.86

† Niuean, Fijian, Fijian Indian, Tokelauan, Māori or European/Pākehā.