PROBLEM GAMBLING - PACIFIC ISLANDS FAMILIES LONGITUDINAL STUDY

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Background

The Pacific Islands Families (PIF) study has been following a cohort of Pacific children since the year 2000. The purpose of this prospective study is to determine the pathways leading to optimal health, development and social outcomes for Pacific children and their families.

Pacific peoples are at high risk for developing problem gambling (the highest risk of the ethnicities living in New Zealand) and have shown heterogeneous differences between the different Pacific cultures in relation to gambling. This highlights the need for significant further study in this area. The longitudinal cohort PIF study has offered a valuable and unique opportunity to study gambling and problem gambling within a Pacific family and child development context, allowing for sub-analyses of the major ethnic Pacific groups and the potential to begin identifying risk and protective factors in the development of problem gambling.

In April 2006, the Gambling Research Centre at Auckland University of Technology was commissioned by the Ministry of Health to conduct the research project *Problem Gambling - Pacific Islands Families Longitudinal Study*. The purpose of this project was to enhance and add value to the existing PIF study by incorporating a substantial gambling component in the six-year data collection phase.

Methodology

A range of gambling-related questions was incorporated into the interview questionnaire protocols for mothers and fathers of the cohort children at the six-year data collection phase. The questions related to gambling participation and to having problems because of someone else's gambling, and included problem gambling screens (Problem Gambling Severity Index [PGSI] for mothers and fathers, and South Oaks Gambling Screen - Revised [SOGS-R] for fathers only).

All cohort parents (mothers and fathers) were invited to participate in the PIF study six-year assessment. In keeping with previous procedures, all participants were visited in their homes by gender- and ethnically-matched interviewers to complete the structured assessments.

Results and discussion

This study has significantly increased the knowledge around Pacific peoples' gambling since the nature of the general population cohort has allowed for analyses to be performed by different Pacific ethnicities and other cultural and demographic variables, which is not usually possible in general population studies due to small Pacific participant sample sizes.

Whilst the data in this report represent a cross-section in time, at the six-year data collection point for the cohort, the potential exists for gambling to continue to be a significant part of future data collection phases. This will allow for longitudinal analyses to explore the links between parental gambling and child development of gambling behaviours, as well as risk and protective factors for problem gambling amongst not only adults but also children as they progress through teenage years and into adulthood. It will also allow for exploration of

changes over time in regard to gambling participation and problem gambling risk and protective factors.

Gambling participation was lower amongst the participants in the cohort than would be expected though a bimodal distribution of gambling (low numbers of people gambling with those who do gamble reporting higher than average expenditure on gambling) was apparent, as was expected from previous national prevalence surveys. Thirty-six percent of all mothers and 30% of all fathers reported that they had gambled in the previous 12 months. Of the mothers and fathers who had gambled, Lotto was the form of gambling most played (89% mothers, 88% fathers) with much lower levels of participation in other forms of gambling. Gender differences were apparent for non-Lotto forms of gambling with mothers participating in Housie and Instant Kiwi gambling (both at 11%) and fathers participating in casino electronic gaming machine (20%), non-casino electronic gaming machine (15%) and Instant Kiwi (14%) gambling. The most preferred forms of gambling were Lotto (80% of gamblers) followed by Housie (9%) for mothers and Lotto (78%) followed by horse/dog race betting (6%) and sports betting at the TAB (5%) for fathers.

Amongst those who gambled, four percent of mothers and 16% of fathers were classified as moderate risk or problem gamblers using the PGSI. Using the SOGS-R, 10% of fathers were classified as problem or probable pathological gamblers.

Ethnicity appeared to be a key factor in mothers' gambling but not for fathers. Tongan mothers were less likely to gamble than Samoan mothers; however, those who gambled were 2.4 times more likely to be classified as at risk/problem gamblers, indicating that Tongan mothers are at higher risk for developing problem gambling. Cultural orientation appeared to be related to gambling (in some cases, less gambling) both for mothers and fathers, though different orientations were associated with gambling for the different genders. Fathers who were in the higher total net weekly household income brackets (>$500) were more likely to gamble than fathers in the lower income bracket (<$501), whilst mothers with post-school qualifications were less likely to gamble (0.7 times) than mothers with no formal qualifications.

Further gender differences were noted in terms of associations between gambling and health. For fathers both gambling and at risk/problem gambling were associated with psychological distress. Fathers who gambled were more likely to be perpetrators as well as victims of verbal aggression than fathers who did not gamble, with at risk/problem gambling also being associated with physical violence. These findings were not noted amongst mothers whereby at risk/problem gamblers were significantly less likely to perpetrate violence than non-problem gamblers.

Not unexpectedly, smoking and alcohol consumption (particularly at higher/harmful levels) were associated with gambling (though not with at risk/problem gambling) both for mothers and fathers. In addition, mothers who drank alcohol were also more likely to have a weekly gambling expenditure in the upper quartile (≥$20) than mothers who did not drink, with increased frequency and amount of consumption associated with increased risk of higher gambling expenditure; this finding was not noted amongst fathers.

In addition, a clear association was noted between higher (upper quartile) expenditure on gambling and being classified (PGSI) as a low risk/moderate risk/problem gambler with at risk/problem gambler classified mothers three times more likely, and at risk/problem gambler classified fathers six times more likely to spend in the upper quartile on gambling than non-problem gamblers.

The problem gambling screens used (PGSI for mothers and fathers and SOGS-R for fathers only) showed very good internal consistency (reliability). There was good agreement between the PGSI and SOGS-R with 94% of fathers identified as problem gamblers by the SOGS-R also being classified as at risk/problem gamblers by the PGSI. In addition, questions related to lying about gambling and betting more than intended also associated well with the PGSI and SOGS-R within this Pacific cohort. The results suggest that the use of any of these problem gambling screens may be valid for use within a general Pacific population, though this would need to be further tested.

Four percent of mothers and ten percent of fathers reported that they had experienced problems because of someone else's gambling.

The findings detailed in this report indicate that different gender and ethnic differences exist amongst Pacific people who should, therefore, not be considered as a homogeneous group. This has implications for service provision by organisations providing services for Pacific people as well as social marketing campaigns around gambling and problem gambling.

1. BACKGROUND

The Pacific Islands Families (PIF) study employs epidemiological methods and a prospective design to follow a cohort of 1,398 Pacific children and their families to assess the children's development and wellbeing. The cohort was identified from infants born at Middlemore Hospital, South Auckland during the period 15 March to 17 December 2000. The PIF study is principally funded by the Foundation for Research, Science and Technology and has, to date, focused on the key developmental stages of early infancy and childhood together with the influence of the socio-cultural context and family environment on Pacific children. The key aims of the PIF study are to determine the pathways leading to optimal health, development and social outcomes for Pacific children and their families as they negotiate critical developmental transitions.

The initial cohort size of approximately 1,400 was recruited to allow, with attrition over the years, sufficient statistical power to detect moderate to large differences after stratification for Pacific ethnicity and other key variables.

The children were selected from live births where the child had at least one parent who identified as being of Pacific ethnicity and was also a New Zealand permanent resident. Full details regarding study design and methodology are described in-depth elsewhere (Paterson et al., 2002, 2003, 2006).

Data collection points have been at six weeks, 12 and 24 months, and four and six years after the birth of the child. Interviews with mothers have taken place at all data collection points. Interviews with fathers occurred at the 12-month, 24-month and six-year data collection points. Interviews and assessments of children occurred at the six-year data collection point.

Routine data collected at the six-year time point included parental and child demographic details, and information relating to the home environment, child development, how the child is raised, child activity and behaviour, child health, support systems, parental health and physical activity, partner relationships and parental cultural orientation.

Nationally representative prevalence surveys conducted in 1991 and 1999 identified that Pacific peoples are at substantially greater risk of developing problems related to gambling than other population groups, with an estimate that they are more than six times more likely to have problems than European/Pakeha populations. The prevalence surveys also indicated that Pacific peoples have a 'bimodal' distribution for gambling, meaning that whilst fewer Pacific peoples take part in gambling activities than the general population, a disproportionate number of those who do gamble have a higher expenditure than other population groups (Abbott & Volberg, 2000; Abbott, 2001). Abbott and Volberg (2000) hypothesised that Pacific peoples might be at high risk for developing gambling problems due to the bimodal distribution since those that gamble tend to have higher levels of involvement with continuous forms of gambling, are less likely to have experience with those forms of gambling, and can be experiencing stress associated with acculturation, unemployment or under-employment.

A later national population study conducted in 2002/03 confirmed previous findings of Pacific peoples being the most at-risk group for developing gambling problems with a risk ratio of 4.5[2] times more likely than European/Others (Ministry of Health, 2006).

Preliminary results from the first data collection point in the PIF study (mothers at six-weeks post-partum) also indicated a bimodal distribution for gambling. Only 30% of the mothers had participated in gambling activities during the prior 12 months, with those mothers spending in the upper quartile for usual weekly expenditure ($\geq$ $20) being 8.2 times more likely to be criticised by others for their gambling than those who spent less. Findings also indicated that the Pacific population is not homogeneous in relation to gambling, with Tongan mothers more likely to gamble and to be in the upper quartile for usual weekly expenditure than Samoan mothers (Bellringer, Perese, Abbott, & Williams, 2006).

The high risk for Pacific peoples developing problem gambling and the heterogeneous differences between the different Pacific ethnicities in New Zealand have highlighted the need for significant further study in this area. The longitudinal cohort PIF study has offered a valuable and unique opportunity to study gambling and problem gambling within a Pacific family and child development context, allowing for sub-analyses of the major ethnic Pacific groups and the potential to begin identifying risk and protective factors in the development of problem gambling. This latter will be achievable if gambling continues to be included in the cohort questionnaire design at subsequent data collection points, allowing for time tracking of potential predictors for problem gambling amongst the cohort parents, and also amongst the cohort children, once they are of an age to be able to be surveyed.

In April 2006, the Gambling Research Centre at Auckland University of Technology was commissioned by the Ministry of Health to conduct the research project *Problem Gambling - Pacific Islands Families Longitudinal Study.* The purpose of this project was to enhance and add value to the existing PIF study by incorporating a substantial gambling component in the six-year data collection phase. Prior to the six-year time point, a limited number of questions (between three to five questions) relating to gambling had been asked of mothers at all data collection points. In addition, the South Oaks Gambling Screen - Revised (SOGS-R) (Abbott & Volberg, 1991, 1996) was administered to fathers at the 24-month data collection point.

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[2] It should be noted that a non-standard problem gambling screen, developed specifically for this survey, was used. The previous national prevalence surveys in 1991 and 1999 used the validated Revised South Oaks Gambling Screen (SOGS-R). Thus, the results from the surveys are not directly comparable.

2. RESEARCH METHODOLOGY

2.1 Ethics approval

Ethical approval for the full six-year phase of the PIF study was granted by the Northern X Ethics Committee of the Health and Disability Ethics Committees. This is a Health Research Council accredited human ethics committee. All participant materials (i.e. questionnaires, information sheets and consent forms) and other relevant documents were submitted to the Committee, which considers the ethical implications of proposals for research projects with humans where participants are asked questions in relation to their health.

Throughout the six-years of the PIF study the following measures have been taken to protect the identity of the participants:
- All participants have been allocated a code by the research team to protect their identities
- No personal identifying information has been reported

In addition:
- Participants are routinely informed that participation in the research is voluntary and that they can withdraw at any time

2.2 Cultural awareness

Cultural safety, integrity and appropriateness of the research process have been key considerations throughout the six years of the PIF study. In this regard, one of the study's co-directors is of Pacific ethnicity, the core team comprises several Pacific researchers including those fluent in the different Pacific languages, and the study is advised by a board comprising Pacific community and health sector representatives. In addition, interviewers recruited specifically for each data collection phase of the study are ethnically matched to the major Pacific ethnicities of the participants (namely Samoan, Tongan and Cook Island).

2.3 Research design

2.3.1 Objectives

The primary objectives of this project were to collect in-depth gambling-related data from mothers and fathers when the children were six years of age to:
- Assess extent of gambling and problem gambling amongst Pacific parents
- Identify any ethnic difference in gambling/problem gambling between the major Pacific cultures (in particular Samoan, Tongan and Cook Island)
- Identify gender differences in problem gambling prevalence
- Examine the risks and correlates of problem gambling in Pacific mothers and fathers
- Assess the impact of gambling and problem gambling on family and child health and wellbeing
- Assess the relationship between problem gambling and specific gambling types
- Assess how standard problem gambling measures perform when used in Pacific groups

2.3.2 Design

A range of gambling-related questions was incorporated into the interview questionnaire protocols for mothers and fathers of the cohort children at the six-year data collection phase. The questions are detailed in Appendix 1 (mothers) and Appendix 2 (fathers). They included questions relating to gambling participation, problem gambling screens (Problem Gambling Severity Index [PGSI] for mothers and fathers, and South Oaks Gambling Screen - Revised [SOGS-R] for fathers only) and questions relating to having problems because of someone else's gambling.

The gambling participation questions for mothers are the same as those asked at previous data collection points in the PIF study. This will enable a continuation of gambling participation tracking over time, which could be important in the identification of risk and protective factors for problem gambling development.

The PGSI was included in the interview protocols as it is a brief nine-item screen developed specifically for use in population surveys (Ferris & Wynne, 2001) and which is starting to be widely used internationally as well as nationally (e.g. in the 2006/07 New Zealand Health Survey); this will facilitate comparison of results between this study, and national and international surveys. The PGSI also allows for gambler classification in a current (past year) time frame.

As previously indicated, the SOGS-R was administered to fathers at the 24-month assessment point. Whilst it would have been useful to administer the same screen at the six-year time point both for mothers and fathers, there were constraints on the size of the total interview protocol that the mothers could reasonably be expected to complete. Since the SOGS-R was used in the two national gambling prevalence surveys conducted in 1991 and 1999 (Abbott & Volberg, 1991, 2000), for comparative purposes (with previous data from the PIF study and with national data) and in order to measure the validity of the PGSI amongst Pacific peoples and against the SOGS-R, the SOGS-R in the same format as was administered at the 24-month data collection point was also administered to fathers at the six-year assessment point.

For the mothers, questions around gambling participation and having problems because of someone else's gambling were collected concurrently with the main PIF study interview protocol. However, to reduce respondent burden due to the large number of questions within the PIF protocol, the PGSI and questions relating to lying and betting were asked at a supplementary interview. Only those mothers who had previously indicated that they gambled (via the main interview protocol) were asked the supplementary interview questions. For the fathers, all gambling questions were incorporated into the main PIF study interview protocol.

2.3.3 Recruitment

All PIF cohort families (N=1,376) were invited to participate in the PIF study six-year assessment, with the exception of those who have withdrawn from the study and those who are currently not living in New Zealand or Australia. The nature of this longitudinal study allows for those who may have decided not to participate in some earlier assessments, to still be eligible for subsequent assessments should they wish. In keeping with previous procedures, all participants in the PIF study were visited in their homes to complete the structured interviews.

Participants were given the opportunity to respond in their primary languages. However, the interview protocols were only translated into Tongan as the majority of participants using a translated protocol at the first assessment point were of Tongan ethnicity. Translated versions of the protocols were checked by fluent Tongan speakers to ensure that they matched the English versions. All interviewers were ethnically- and gender-matched to the participants and were fluent in the required Pacific language so that concepts could be verbally clarified, where necessary.

2.3.4   Participation

Data collection for mothers (main interview protocol) commenced on 22 March 2006 and completed on 5 July 2007. A total of 1,019 mothers' main interview questionnaires was completed. This achieved our goal of at least 1,000 completed questionnaires being obtained and is a slight attrition from the 1,066 completed questionnaires obtained at the four-year data collection point (two years previously). Some attrition is inevitable as families move and cannot be traced (including emigration) or drop out of the study for personal reasons. Note, however, that the 1,019 completed questionnaires include mothers with more than one child in the cohort (e.g. twins), thus the total number of mothers (questionnaires) for whom gambling data have been obtained is 1,001[3].

Data collection for the fathers' interview protocol commenced on 7 May 2006 and completed on 30 August 2007. A total of 602 fathers' interview questionnaires was completed. This is a slight attrition from the 738 completed questionnaires obtained at the 24-month data collection point (four years previously and the last time fathers were interviewed). The attrition is slightly greater than for mothers for the same reason as described in the previous paragraph but also due to the greater difference in time between assessments and the fact that some families had broken in that time period with fathers no longer part of the family unit/ accessible for interview). Some fathers, as with the mothers, are the parent of twins in the cohort, so the total number of fathers (questionnaires) for whom gambling questions were obtained is 591.

Data collection for mothers' supplementary gambling questionnaires commenced on 13 July 2006 and completed on 29 December 2007. Only mothers who indicated that they gambled, in the main interview protocol, were asked the supplementary questions. A total of 303 questionnaires was completed, representing 83% of the 363 mothers who indicated that they had gambled in the main interview protocol. The remaining 17% of mothers who had gambled either refused to complete the gambling supplementary questionnaires or were unable to be contacted at the time of data collection for the supplements.

2.3.5   Data analysis

All analyses were performed using the SPSS for MS Windows (15.0) and SAS version 9.1 statistical software packages, and a significance level of 0.05 was used to determine statistical significance for all calculations.

Univariate and multivariate logistic regression procedures were performed to examine associations between the gambling questions and specific demographic, social and cultural variables assessed at the six-year measurement point.

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[3] Mothers complete a questionnaire for each child but the gambling questions are only completed once per mother as the gambling questions relate to the adult and not the child.

Binary outcomes for the gambling questions were: (1) whether respondents had gambled at all during the previous 12 months, (2) whether those who gambled usually spent in the upper quartile of expenditure ($\geq$$20/week for mothers, $\geq$$60/month for fathers), and (3) whether those who had gambled were at risk/problem gamblers screened using PGSI or SOGS-R.

Predictor variables examined in the univariate logistic regression analyses were age, ethnicity, social marital status, education level, net household income, whether born in New Zealand, years lived in New Zealand, cultural orientation, whether smoked, and alcohol (two alcohol consumption variables, frequency and amount, for mothers; AUDIT score for fathers). Numerical predictor variables such as age and household income were categorised prior to the analyses.

With regard to the multiple logistic regression analyses, the above variables (except whether born in New Zealand and years lived in New Zealand for fathers, due to many missing values) were submitted to a forward stepwise entry procedure in each of the two gambling outcome models, one using the whole cohort (whether gambler or not) and the other using the gambler cohort (whether problem gambler or not) (P to enter = 0.15 and P to remove = 0.20).

In addition, associations of gambling variables with specific health outcomes measured using the General Health Questionnaire (GHQ), Conflict Tactics Scale (CTS) and Child Behaviour Checklist (CBCL) were explored using unadjusted and adjusted logistic regression models. In the adjusted analyses, the gambling variable was forced into the models while the other confounding factors were submitted using forward stepwise entry procedure (P to enter = 0.15 and P to remove = 0.20).

Nagelkerke's R^2 was used to estimate the variability in the dependent variable explained by the logistic regression model and Hosmer-Lemeshow's goodness-of-fit test was conducted to determine whether the model fit was adequate.

3. RESULTS

This section presents data relating to the mothers and fathers of the PIF cohort children at the six-year data collection time point (i.e. when the cohort children were six years of age). The terms 'mother' and 'father' relate to the primary female and male caregivers in the child's life and thus include birth mothers and fathers, adoptive mothers and fathers and others (for example current partner of birth mother, or grandmother being primary caregiver). The majority of mothers and fathers referred to in these data (98% and 97% respectively) were birth parents.

The results presented include socio-demographic data, gambling participation, preferred form of gambling, gambling expenditure, problem gambling screen data, associations between gambling/problem gambling and specific variables, associations between gambling/problem gambling and specific health outcomes, and whether the participants have had problems due to someone else's gambling.

Descriptive statistics are presented in Section 3.1 for mothers and Section 3.3 for fathers. Associative statistics are presented in Section 3.2 for mothers and Section 3.4 for fathers.

3.1   Mothers: Descriptive statistics

Presented in this Section are demographic data relating to the mothers' gambling activity and expenditure, whether the mothers had problems due to someone else's gambling, Problem Gambling Severity Index scores and the internal consistency of the PGSI screen with this population, and the lying/betting behaviour of the mothers who reported gambling. Where possible, information obtained at the six-year data collection point was used in the analyses; however, for some demographic information collected once only at baseline (e.g. ethnicity), the six weeks baseline data have been used.

3.1.1 Demographic data

Socio-demographic characteristics of the mothers are presented in Table 1.

Almost half of the mothers (46%) were of Samoan ethnicity, just under one quarter (22%) were Tongan, 17% Cook Island and the remainder were of other Pacific or non-Pacific ethnicity. Half (53%) were in the 30 to 39 year age bracket and the highest educational status of over half (55%) of mothers was secondary school qualification or less. A majority were partnered (81%), just under half (47%) had a weekly net household income of $501 to $1,000, two-thirds were not New Zealand born (66%) and a majority had lived in New Zealand for 11 or more years (86%). The cultural orientation of the mothers generally included retaining a high Pacific focus with low New Zealand focus (34%) or vice versa (33%) with the remainder having either strong alignment both to Pacific and New Zealand cultures or weak alignment to both. One-third (34%) of the mothers smoked and one-third (35%) drank alcohol.

Table 1: Mothers - Socio-demographic characteristics

	N	(%)
Age (years)		
20 - 29	237	(24.7)
30 - 39	510	(53.1)
40+	213	(22.2)
Highest educational qualification		
No formal qualifications	304	(31.7)
Secondary school qualification	221	(23.0)
Post school qualification	435	(45.3)
Ethnicity		
Samoan	444	(46.2)
Cook Island	167	(17.4)
Niuean	45	(4.7)
Tongan	211	(22.0)
Other Pacific [#]	28	(2.9)
Non Pacific	66	(6.9)
Marital status		
Partnered	776	(80.7)
Non partnered	185	(19.3)
Household weekly income		
$0 - $500	217	(22.6)
$501-$1,000	449	(46.7)
>$1,000	258	(26.8)
Unknown	37	(3.9)
Years lived in New Zealand		
6 - 10	137	(14.3)
11 - 20	306	(31.9)
>20	515	(53.8)
NZ born		
No	636	(66.2)
Yes	325	(33.8)
Cultural orientation		
High NZ, Low Pacific	311	(32.5)
Low NZ, High Pacific	322	(33.6)
High NZ, High Pacific	155	(16.2)
Low NZ, Low Pacific	169	(17.7)
Smoking status		
No	630	(66.5)
Yes	318	(33.5)
Alcohol consumption (frequency)		
Never	624	(65.1)
Two to four times a month or less	312	(32.6)
Two to three times a week or more	22	(2.3)

N = 961
Numbers (and percentages) do not always total 961 (or 100%) due to missing values
Includes mothers identifying equally with two or more Pacific groups, equally with Pacific and non-Pacific groups, or with Pacific groups other than Tongan, Samoan, Cook Island or Niuean

3.1.2 Gambling activity

Of the 1,001 mothers, 36% (n=363) stated that they had taken part in at least one form of gambling activity during the previous 12 months. One-third of all mothers had played Lotto (32%). Overall participation in other forms of gambling was low with Housie and Instant Kiwi both played by four percent of mothers, three percent played Keno, and two percent played electronic gaming machines in a casino. All other forms of gambling were played by one percent or less of the mothers. Data are presented in Figure 1. Actual numbers of mothers participating in each form of gambling activity are presented in Appendix 3.

Of the 363 mothers who gambled, almost all (89%) had played Lotto. Overall participation in other forms of gambling was low with Housie and Instant Kiwi both played by about 11% of mothers who gambled, seven percent played Keno, and 5.5% played electronic gaming machines in a casino. All other forms of gambling were played by three percent or less of the mothers who gambled. Data are presented in Figure 2.

Of the mothers who gambled, three-quarters (77%) only gambled on one activity with the remaining 23% gambling on multiple forms, ranging from two to five. The most preferred form of gambling was Lotto (80%) followed by Housie (nine percent). Each of the other forms of gambling was the most preferred form by four percent or less of the respondents.

Figure 1: Mothers - Gambling per activity, percentage of all mothers
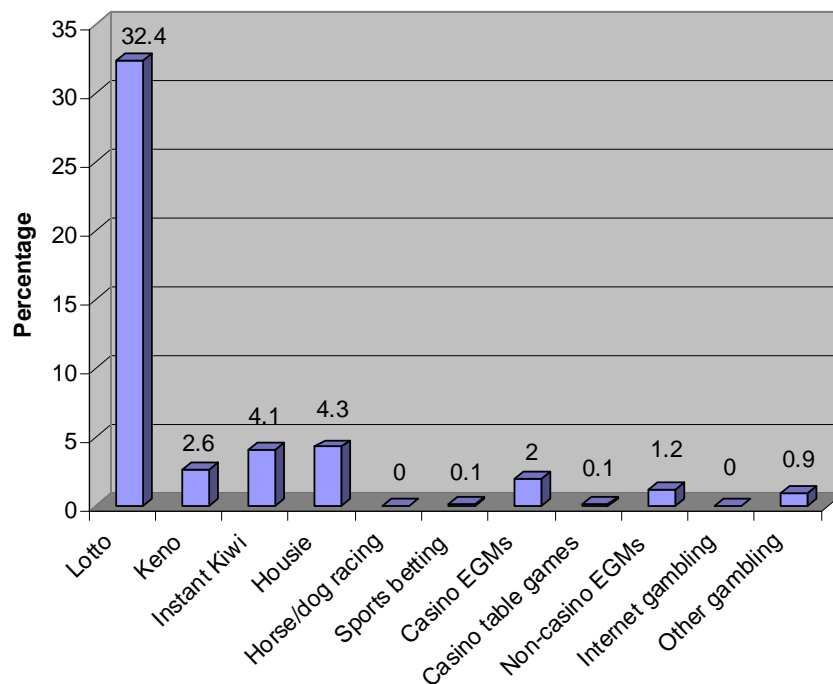
Figure 2: Mothers - Gambling per activity, percentage of mothers who gambled
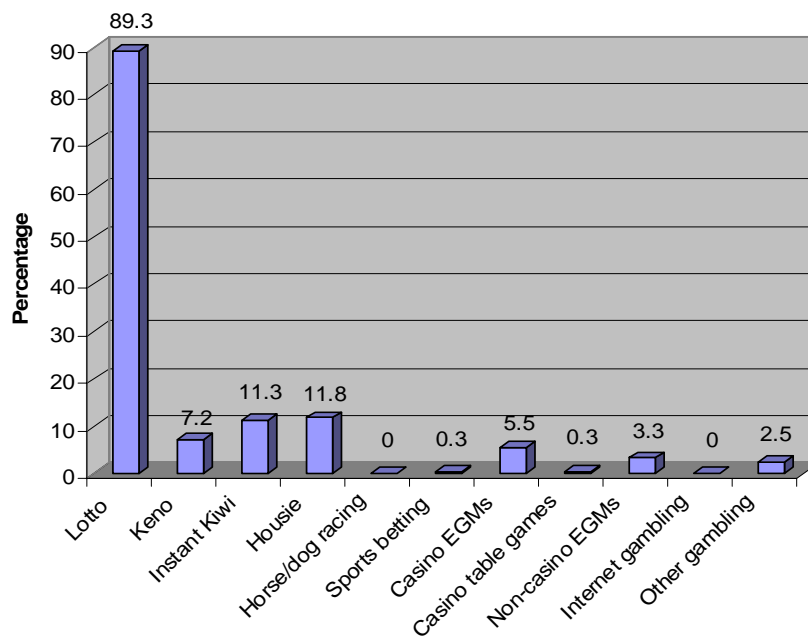
3.1.3 Gambling expenditure

The median weekly expenditure on gambling was $11 (range $1 to $146). When expenditure was reviewed per activity type, higher median usual weekly expenditures were noted for only a few forms of gambling. The highest median usual weekly expenditure was noted for Housie gambling ($26) which was played by only four percent of the mothers. A median usual weekly expenditure of $20 was observed for electronic gaming machine gambling both within, and outside, casinos, and on 'other' forms of gambling; these gambling activities were each participated in by two percent or less of the mothers. Findings for the main gambling activities are presented in Figure 3; some activities are not presented due to small or zero sample sizes.

Figure 3: Mothers - Median usual weekly expenditure per gambling activity
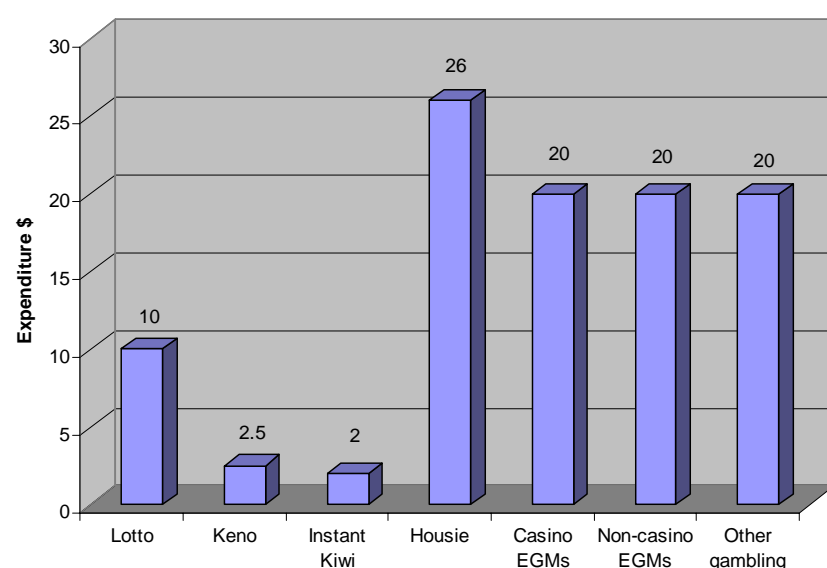
3.1.4 Problems due to someone else's gambling

Four percent (n=41) of all mothers (N=1,001) stated that they had experienced problems because of someone else's gambling in the previous 12 months. Eighty-three percent of mothers who had experienced problems due to someone else's gambling cited electronic gaming machines in a casino (56%) or pub/club (27%) as the type of gambling involved, 17% cited each of Housie and sports betting at the TAB and 15% had problems due to someone else's Lotto gambling. Other forms of gambling that caused problems were Keno, Instant Kiwi, betting on horse/dog racing, and 'other' types of gambling, each at eight percent or less.

3.1.5 Problem Gambling Severity Index scores

Figure 4 presents the distribution of PGSI scores for the 299 mothers who had gambled in the previous 12 months and for whom valid data were available for each of the nine PGSI questions.

The majority (84%, n=250) of mothers scored zero on the PGSI indicating non-problem gambler status. Twelve percent (n=35) scored one or two indicating low risk status. Moderate risk gamblers (PGSI score three to seven) comprised 3.3% of mothers (n=10) and one percent of the mothers who gambled were categorised as problem gamblers (n=4). Although the potential range of scores was zero to 27, the highest score was 12, indicating that no participant was in the very severe range of problem gambling.

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Figure 4: Mothers - Distribution of PGSI scores
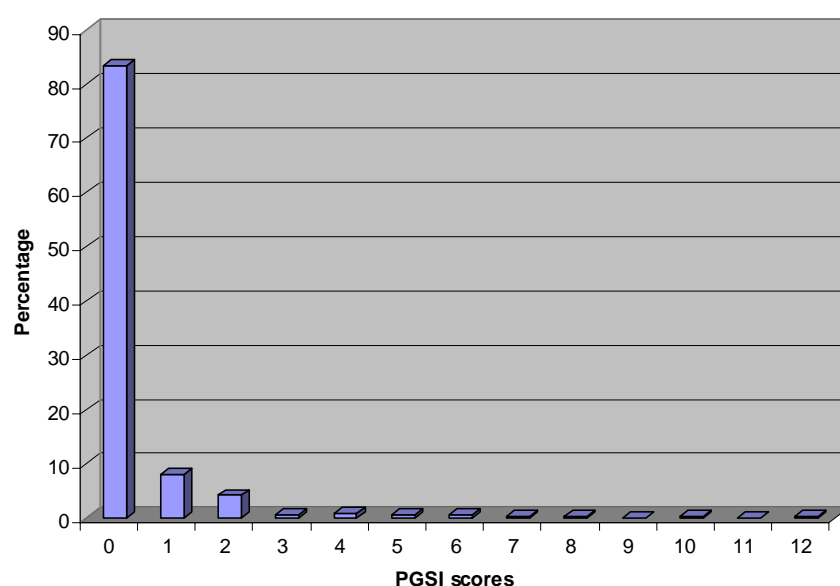
3.1.6 Internal consistency of Problem Gambling Severity Index

Cronbach's alpha was used to test internal consistency. A Cronbach's alpha of 0.7 is generally viewed as an acceptable level of internal consistency. The overall alpha value of 0.86 (Table 2) indicates a very good internal consistency (reliability). Table 2 shows the effect of deleting each individual item of the scale on Cronbach's alpha; only one item detracts slightly from the reliability of the questionnaire - Question 1: Thinking about the past 12 months, how often have you bet more than you could really afford to lose?

Table 2: Mothers - PGSI Cronbach's alpha

PGSI items: Thinking about the past 12 months, how often…	Cronbach's alpha if item deleted
…have you bet more than you could really afford to lose?	0.87
…have you needed to gamble with larger amounts of money to get the same feeling of excitement?	0.84
…have you gone back another day to try to win back the money you lost?	0.83
…have you borrowed money or sold anything to get money to gamble?	0.86
…have you felt that you might have a problem with gambling?	0.83
…have people criticised your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?	0.83
…have you felt guilty about the way you gamble, or what happens when you gamble?	0.83
…has your gambling caused you any health problems, including stress or anxiety?	0.85
…has your gambling caused any financial problems for you or your household?	0.84
Overall	0.86

3.1.7 Lying and betting

Valid data were available for the three questions on lying and betting for 299 mothers who had gambled in the previous 12 months (Table 3). The vast majority of mothers had never lied to family members or others to hide their gambling (99%), had never bet or spent more money than they wanted to on gambling (96%), and had never wanted to stop betting money or gambling but did not think they could (95%). One percent of the mothers had lied about their gambling 'most of the time' and a further one percent had lied 'sometimes'. Of the mothers who had bet or spent more money than they wanted to on gambling, three percent had 'sometimes' done this and one percent reported this was the case 'most of the time'. Of the mothers who had wanted to stop betting money or gambling but did not think they could stop, one percent reported this 'sometimes', two percent reported 'most of the time' and two percent reported 'almost always'.

Table 3: Mothers - Numbers and percentages of lying and betting behaviour

	Never		Sometimes		Most of the time		Almost always	
	n	(%)	n	(%)	n	(%)	n	(%)
Lied to hide gambling	295	(99)	2	(1)	2	(1)	-	-
Bet/spent more than intended	288	(96)	9	(3)	2	(1)	-	-
Wanting to stop betting/gambling	284	(95)	4	(1)	6	(2)	5	(2)

Percentages do not always add up to 100 due to rounding

3.2	Mothers: Association statistics

This Section presents data pertaining to the mothers of associations between gambling/ problem gambling and specific socio-demographic variables, as well as associations between gambling/problem gambling and specific health outcomes (child behaviour, maternal psychological distress, and intimate partner violence). Finally, associations between the lying and betting questions, and the PGSI are presented. Where possible, information obtained at the six-year data collection point were used in the analyses; however, for some demographic information collected once only at baseline (e.g. ethnicity), the six-weeks baseline data have been used. Since baseline data were required, the number of mothers available for use in the association statistics has been reduced from 1,001 to 961 (number of mothers assessed at baseline and at the six-year time point).

In regard to the PGSI, since there were limited numbers of low risk (n=35), moderate risk (n=10) and problem gamblers (n=4) this variable was dichotomised into non-problem gamblers (n=248) versus low risk/moderate risk/problem gamblers (n=49) for the analyses (rather than using a multinomial logistic regression).

3.2.1 Gambling activity

Table 4 details univariate odds ratios of mothers gambling in the previous 12 months and associations with various socio-demographic variables. Statistical significance was attained between mothers' gambling participation and age, educational level, ethnicity, cultural orientation, smoking and alcohol consumption.

Mothers who were aged 40 or more years were 1.8 times more likely to gamble than mothers in the 20 to 29 year age bracket, whilst mothers with post-school qualifications were less likely to gamble (0.70 times) than mothers with no formal qualifications. Percentages of mothers gambling in the different ethnic groups ranged from 26% (Tongans) to 42% (non-Pacific). Logistic regression analyses indicated that Tongan mothers were about half as likely to gamble in comparison with Samoan mothers. Mothers who identified with New Zealand culture and retained their Pacific culture (High NZ, High Pacific) were 1.8 times more likely to gamble than mothers who identified with New Zealand culture but had reduced Pacific cultural orientation (High NZ, Low Pacific). Mothers who smoked and/or drank alcohol were more likely to gamble than mothers who did not partake in those activities, with frequency and amount of alcohol consumed on a typical occasion being further indicators for gambling. The odds of gambling during the past 12 months were 1.6 times greater for those drinking two to four times a month, and 2.5 times greater for those drinking two to three times a week or more, compared with non-drinkers. Additionally, those drinking three to six drinks on a typical day were 1.9 times more likely to gamble than non-drinkers.

In the multivariate logistic regression analyses, all variables retained their significant associations with gambling activity with the exception of educational status and alcohol consumption (amount) (Table 5). In addition, all cultural orientations were statistically more likely to gamble in comparison with those showing High New Zealand orientation with Low Pacific orientation.

Table 4: Mothers - Numbers, percentages and univariate odds ratios for gambling

Variable	Category	Gambled in past 12 months				Univariate odds ratio	
		Yes	(%)	No	(%)	OR	(95% CI)
Age (years)	20 - 29	73	(30.8)	164	(69.2)	1.00	
	30 - 39	177	(34.7)	333	(65.3)	1.19	(0.86, 1.66)
	40+	96	(45.1)	117	(54.9)	1.84	(1.25, 2.71)*
Ethnicity	Samoan	175	(39.4)	269	(60.6)	1.00	
	Cook Island	62	(37.1)	105	(62.9)	0.91	(0..63, 1.31)
	Niuean	17	(37.8)	28	(62.2)	0.93	(.50, 1.76)
	Tongan	55	(26.1)	156	(73.9)	0.54	(0.38, 0.78)**
	Other Pacific[#]	10	(35.7)	18	(64.3)	0.85	(0.39, 1.89)
	Non Pacific	28	(42.4)	38	(57.6)	1.13	(0.67, 1.91)
Social marital status	Partnered	279	(36.0)	497	(64.0)	1.00	
	Non-partnered	68	(36.8)	117	(63.2)	1.04	(0.74, 1.44)
Education	No formal qualifications	124	(40.8)	180	(59.2)	1.00	
	Secondary school qualification	81	(36.7)	140	(63.3)	0.84	(0.59, 1.20)
	Post school qualification	142	(32.6)	293	(67.4)	0.70	(0.52, 0.95)*
Household income	$0 - $500	74	(34.1)	143	(65.9)	1.00	
	$501-$1,000	155	(34.5)	294	(65.5)	1.02	(0.72, 1.43)
	>$1,000	102	(39.5)	156	(60.5)	1.26	(0.87, 1.84)
	Unknown	16	(43.2)	21	(56.8)	1.47	(0.73, 2.99)
Born in NZ	No	235	(36.9)	401	(63.1)	1.00	
	Yes	112	(34.5)	213	(65.5)	0.90	(0.68, 1.19)
Years lived in NZ	6-10	50	(36.5)	87	(63.5)	1.00	
	11-20	108	(35.3)	198	(64.7)	0.95	(0.62, 1.44)
	>20	188	(36.5)	327	(63.5)	1.00	(0.68, 1.48)
Cultural Orientation	High NZ, Low Pacific	97	(31.2)	214	(68.8)	1.00	
	Low NZ, High Pacific	116	(36.0)	206	(64.0)	1.24	(0.89, 1.73)
	High NZ, High Pacific	69	(44.5)	86	(55.5)	1.77	(1.19, 2.63)**
	Low NZ, Low Pacific	65	(38.5)	104	(61.5)	1.38	(0.93, 2.04)
Smoking status	No	202	(32.1)	428	(67.9)	1.00	
	Yes	140	(44.0)	178	(56.0)	1.67	(1.26, 2.20)***
Alcohol consumption (frequency)	Never	202	(32.4)	422	(67.6)	1.00	
	2-4 times a month or less	133	(42.6)	179	(57.4)	1.55	(1.17, 2.05)**
	2-3 times a week or more	12	(54.5)	10	(45.5)	2.51	(1.07, 5.90)*
Alcohol consumption (number drinks)	Nil (non drinker)	202	(32.4)	422	(67.6)	1.00	
	1 or 2	28	(41.2)	40	(58.8)	1.46	(0.88, 2.44)
	3 to 6	91	(46.9)	103	(53.1)	1.85	(1.33, 2.56)***
	7 or more	25	(35.2)	46	(64.8)	1.14	(0.68, 1.90)

N=961; numbers will vary due to missing data for some variables

*P < 0.05, ** P < 0.01, *** P < 0.001

[#] Includes mothers identifying equally with two or more Pacific groups, equally with Pacific and non-Pacific groups or with Pacific groups other than Tongan, Samoan, Cook Island or Niuean

Table 5: Mothers - Adjusted odds ratios for gambling

Variable	Category	Adjusted odds ratio	
		OR	(95% CI)
Age (years)	20 - 29	1.00	
	30 - 39	1.34	(0.94, 1.90)
	40+	2.03	(1.34, 3.07)**
Ethnicity	Samoan	1.00	
	Cook Island	0.91	(0.60, 1.36)
	Niuean	0.84	(0.41, 1.73)
	Tongan	0.58	(0.39, 0.86)**
	Other Pacific[#]	1.05	(0.45, 2.43)
	Non Pacific	1.54	(0.86, 2.79)
Cultural Orientation	High NZ, Low Pacific	1.00	
	Low NZ, High Pacific	1.92	(1.26, 2.90)**
	High NZ, High Pacific	2.01	(1.28, 3.16)**
	Low NZ, Low Pacific	1.69	(1.10, 2.59)*
Smoking status	No	1.00	
	Yes	1.56	(1.13, 2.15)**
Alcohol consumption (frequency)	Never	1.00	
	2-4 times a month or less	1.51	(1.07, 2.12)*
	2-3 times a week or more	2.58	(1.00, 6.65)*

N=938

Nagelkerke R^2=7.9%, Hosmer-Lemeshow goodness-of-fit P-value=0.234.

* P < 0.05, ** P < 0.01

[#] Includes mothers identifying equally with two or more Pacific groups, equally with Pacific and non-Pacific groups or with Pacific groups other than Tongan, Samoan or Cook Island

3.2.2 Gambling expenditure

Table 6 details univariate odds ratios of mothers spending $20 or more (upper quartile of expenditure) per week on gambling in the previous 12 months and associations with various socio-demographic variables. Statistical significance was attained between mothers' gambling expenditure and alcohol consumption.

Mothers who drank alcohol were more likely to have weekly gambling expenditure in the upper quartile (≥$20) than mothers who did not drink, with frequency and amount of alcohol consumed on a typical occasion being further indicators for gambling. The odds of spending ≥$20 weekly on gambling in the past 12 months were 1.8 times greater for those drinking two to four times a month, and 3.0 times greater for those drinking two to three times a week or more (though fell short of attaining statistical significance, P=0.06), compared with non-drinkers. Additionally, those drinking three to six or more drinks on a typical day were more likely to have an increased risk of the higher gambling expenditure than non-drinkers.

In the multivariate logistic regression analyses, alcohol consumption (frequency) retained a significant association with the higher gambling expenditure (Table 7).

Table 6: Mothers - Numbers, percentages and univariate odds ratios of ≥$20 per week expenditure

Variable	Category	Spending ≥NZ$20 per week				Univariate odds ratio	
		Yes	(%)	No	(%)	OR	(95% CI)
Age (years)	20 - 29	26	(35.6)	47	(64.4)	1.00	
	30 - 39	52	(29.4)	125	(70.6)	0.75	(0.42, 1.34)
	40+	27	(28.1)	69	(71.9)	0.71	(0.37, 1.36)
Ethnicity	Samoan	51	(29.1)	124	(70.9)	1.00	
	Cook Island	22	(35.5)	40	(64.5)	1.34	(0.72, 2.47)
	Niuean	8	(47.1)	9	(52.9)	2.16	(0.79, 5.91)
	Tongan	10	(18.2)	45	(81.8)	0.54	(0.25, 1.15)
	Other Pacific#	3	(30.0)	7	(70.0)	1.04	(0.26, 4.19)
	Non Pacific	11	(39.3)	17	(60.7)	1.57	(0.69, 3.59)
Social marital status	Partnered	81	(29.0)	198	(71.0)	1.00	
	Non-partnered	24	(35.3)	44	(64.7)	1.33	(0.76, 2.34)
Education	No formal qualifications	35	(28.2)	89	(71.8)	1.00	
	Secondary school qualification	21	(25.9)	60	(74.1)	0.89	(0.47, 1.68)
	Post school qualification	49	(34.5)	93	(65.5)	1.34	(0.80, 2.26)
Household income	$0 - $500	22	(29.7)	52	(70.3)	1.00	
	$501 - $1,000	45	(29.0)	110	(71.0)	0.97	(0.53, 1.78)
	>$1,000	31	(30.4)	71	(69.6)	1.03	(0.54, 1.98)
	Unknown	7	(43.8)	9	(56.3)	1.84	(0.61, 5.56)
Born in NZ	No	71	(30.2)	164	(69.8)	1.00	
	Yes	34	(30.4)	78	(69.6)	1.01	(0.62, 1.64)
Years lived in NZ	6 - 10	11	(22.0)	39	(78.0)	1.00	
	11 - 20	32	(29.6)	76	(70.4)	1.49	(0.68, 3.28)
	>20	61	(32.4)	127	(67.6)	1.70	(0.82, 3.55)
Cultural Orientation	High NZ, Low Pacific	36	(37.1)	61	(62.9)	1.00	
	Low NZ, High Pacific	32	(27.6)	84	(72.4)	0.65	(0.36, 1.15)
	High NZ, High Pacific	20	(29.0)	49	(71.0)	0.69	(0.36, 1.34)
	Low NZ, Low Pacific	17	(26.2)	48	(73.8)	0.60	(0.30, 1.20)
Smoking status	No	53	(26.2)	149	(73.8)	1.00	
	Yes	49	(35.0)	91	(65.0)	1.51	(0.95, 2.42)
Alcohol consumption (frequency)	Never	50	(24.8)	152	(75.2)	1.00	
	2-4 times a month or less	49	(36.8)	84	(63.2)	1.77	(1.10, 2.85)*
	2-3 times a week or more	6	(50.0)	6	(50.0)	3.04	(0.94, 9.85)
Alcohol consumption (number drinks)	Nil (non drinker)	50	(24.8)	152	(75.2)	1.00	
	1 or 2	9	(32.1)	19	(67.9)	1.44	(0.61, 3.39)
	3 to 6	35	(38.5)	56	(61.5)	1.90	(1.12, 3.23)*
	7 or more	11	(44.0)	14	(56.0)	2.39	(1.02, 5.60)*

N=347; numbers will vary due to missing data for some variables

*P < 0.05

Includes mothers identifying equally with two or more Pacific groups, equally with Pacific and non-Pacific groups or with Pacific groups other than Tongan, Samoan, Cook Island or Niuean

Table 7: Mothers - Adjusted odds ratios of ≥$20 per week expenditure

Variable	Category	Adjusted odds ratio	
		OR	(95% CI)
Alcohol consumption (frequency)	Never	1.00	
	2-4 times a month or less	1.83	(1.13, 2.96)*
	2-3 times a week or more	3.15	(0.97, 10.21)

N=339
Nagelkerke R^2=3.4%
* $P < 0.05$

Mothers with weekly gambling expenditure in the upper quartile (≥$20) were three times more likely to be in the low risk/moderate risk/problem gambler category than mothers with lower weekly gambling expenditure (Table 8).

Table 8: Mothers - Numbers, percentages and univariate odds ratios of being at risk/ problem gamblers and expenditure

Variable	Category	At risk/problem gambler				Univariate odds ratio	
		Yes	(%)	No	(%)	OR	(95% CI)
Weekly expenditure	<20	21	(10.8)	174	(89.2)	1.00	
	≥$20	23	(27.7)	60	(73.3)	3.18	(1.64, 6.15)***

N=278
*** $P < 0.001$

3.2.3 Problem Gambling Severity Index

Analyses of PGSI scores associated with demographic variables requires both baseline and year six questionnaires to have been completed by each mother. This has reduced the total available PGSI-completed questionnaires to 285 (from 299 for all year six mothers) and to 44 low risk/moderate risk/problem gamblers (cf 49 for all year six mothers).

Table 9 details univariate odds ratios of mothers being low/moderate risk gamblers or problem gamblers associated with various socio-demographic variables. Statistical significance was only attained for ethnicity with 'other Pacific' mothers having significantly higher odds of individuals falling into at risk or problem gambler groups than Samoans. However, due to the very small sample size this may be a spurious finding.

In the multivariate logistic regression analyses, Tongan mothers were 2.4 times more likely to have individuals falling into at risk or problem gambler groups than Samoans. 'Other Pacific' mothers retained a significant association with at risk/problem gambling but as noted previously, in view of the small numbers in this group, this may be a spurious finding. Findings are presented in Table 10.

Table 9: Mothers - Numbers, percentages and univariate odds ratios of being at risk/problem gamblers

Variable	Category	At risk/problem gambler				Univariate odds ratio	
		Yes	(%)	No	(%)	OR	(95% CI)
Age (years)	20 - 29	9	(15.5)	49	(84.5)	1.00	
	30 - 39	22	(15.3)	122	(84.7)	0.98	(0.42, 2.28)
	40+	13	(15.9)	69	(84.1)	1.03	(0.41, 2.59)
Ethnicity	Samoan	18	(12.3)	128	(87.7)	1.00	
	Cook Island	6	(13.0)	40	(87.0)	1.07	(0.40, 2.87)
	Niuean	3	(17.6)	14	(82.4)	1.52	(0.40, 5.83)
	Tongan	11	(22.4)	38	(77.6)	2.06	(0.90, 4.74)
	Other Pacific#	3	(42.9)	4	(57.1)	5.33	(1.10, 25.79)*
	Non Pacific	3	(15.0)	17	(85.0)	1.26	(0.33, 4.71)
Social marital status	Partnered	34	(14.8)	196	(85.2)	1.00	
	Non-partnered	10	(18.2)	45	(81.8)	1.28	(0.59, 2.78)
Education	No formal qualifications	14	(13.3)	91	(86.7)	1.00	
	Secondary school qualification	13	(18.8)	56	(81.2)	1.51	(0.66, 3.44)
	Post school qualification	17	(15.3)	94	(84.7)	1.18	(0.55, 2.52)
Household income	$0 - $500	13	(20.0)	52	(80.0)	1.00	
	$501 - $1,000	21	(15.8)	112	(84.2)	0.75	(0.35, 1.61)
	>$1,000	9	(12.2)	65	(87.8)	0.55	(0.22, 1.40)
	Unknown	1	(7.7)	12	(92.3)	0.33	(0.04, 2.80)
Born in NZ	No	28	(14.1)	171	(85.9)	1.00	
	Yes	16	(18.6)	70	(81.4)	1.40	(0.71, 2.74)
Years lived in NZ	6 - 10	6	(14.0)	37	(86.0)	1.00	
	11 - 20	11	(12.0)	81	(88.0)	0.84	(0.29, 2.44)
	>20	26	(17.4)	123	(82.6)	1.30	(0.50, 3.41)
Cultural Orientation	High NZ, Low Pacific	12	(16.2)	62	(83.8)	1.00	
	Low NZ, High Pacific	17	(17.5)	80	(82.5)	1.10	(0.49, 2.47)
	High NZ, High Pacific	4	(6.8)	55	(93.2)	0.38	(0.11, 1.23)
	Low NZ, Low Pacific	11	(20.0)	44	(80.0)	1.29	(0.52, 3.19)
Smoking status	No	21	(12.7)	145	(87.3)	1.00	
	Yes	21	(18.4)	93	(81.6)	1.56	(0.81, 3.01)
Alcohol consumption (frequency)	Never	24	(14.0)	148	(86.0)	1.00	
	2-4 times a month or less	17	(16.0)	89	(84.0)	1.18	(0.60, 2.31)
	2-3 times a week or more	3	(42.9)	4	(57.1)	4.63	(0.97, 21.96)
Alcohol consumption (number drinks)	Nil (non drinker)	24	(14.1)	146	(85.9)	1.00	
	1 or 2	2	(8.3)	22	(91.7)	0.55	(0.12, 2.51)
	3 to 6	15	(19.7)	61	(80.3)	1.50	(0.74, 3.05)
	7 or more	3	(23.1)	10	(76.9)	1.83	(0.47, 7.11)

N=285; numbers will vary due to missing data for some variables

* *P* < 0.05

Includes mothers identifying equally with two or more Pacific groups, equally with Pacific and non-Pacific groups or with Pacific groups other than Tongan, Samoan, Cook Island or Niuean

Table 10: Mothers - Adjusted odds ratios of being at risk/problem gamblers

Variable	Category	Adjusted odds ratio	
		OR	(95% CI)
Ethnicity	Samoan	1.00	
	Cook Island	0.92	(0.34, 2.53)
	Niuean	0.47	(0.57, 3.83)
	Tongan	2.41	(1.02, 5.67)*
	Other Pacific[2]	5.24	(1.06, 25,94)*
	Non Pacific	0.79	(0.17, 3.77)
Smoking status	No	1.00	
	Yes	2.01	(0.99, 4.08)

Nagelkerke R^2=7.0%, Hosmer-Lemeshow goodness-of-fit P-value=0.95.
N=276
* P < 0.05

3.2.4 Lying and betting associated with Problem Gambling Severity Index

Due to the small sample sizes, responses to the lying and betting questions have been dichotomised to 'Yes/No' (i.e. the 'Sometimes', 'Most of the time' and 'Almost always' responses equate to 'Yes' and the 'never' responses equate to 'No').

Lying about gambling
All four mothers who had responded positively (Yes) to the question about lying to hide their gambling fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 9.1% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P=0.001). None of the PGSI classified non-problem gamblers responded positively (Yes) to the question about lying.

Review of the categorical (non-dichotomised) data showed that one of the four mothers who reported lying fell within the PGSI problem gambler classification and represented 25% of this group, whilst the other three mothers who reported lying fell within the PGSI moderate risk gambler classification and represented 30% of this group.

Bet or spent more money than intended
All 11 mothers who had responded positively (Yes) to the question about betting or spending more money than intended on gambling fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 25% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). None of the PGSI classified non-problem gamblers responded positively (Yes) to the question about betting or spending more money than intended on gambling.

Review of the categorical (non-dichotomised) data showed that two of the 11 mothers who reported betting more than intended fell within the PGSI problem gambler classification and represented 50% of this group, six mothers fell within the PGSI moderate risk gambler classification representing 60% of this group, and three mothers fell within the PGSI low risk gambler classification representing 10% of this group.

Lying about gambling and/or bet or spent more money than intended
There were 12 mothers who responded positively to one or both of the questions about lying to hide their gambling, and betting or spending more money than intended on gambling. All

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12 of these mothers fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 27% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). None of the PGSI classified non-problem gamblers responded positively (Yes) to either/both of the questions about lying or betting/ spending more money than intended.

Review of the categorical (non-dichotomised) data showed that two of the 12 mothers who responded positively to one or both of these questions fell within the PGSI problem gambler classification and represented 50% of this group, seven mothers fell within the PGSI moderate risk gambler classification representing 70% of this group, and three mothers fell within the PGSI low risk gambler classification representing 10% of this group.

<u>Wanted to stop betting/gambling</u>
Two (0.8%) of the non-problem gamblers wanted to stop betting/gambling but did not feel able to compared with 12[4] mothers in the at risk/problem gambler PGSI dichotomised classifications; this represented 27% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P<0.001).

Review of the categorical (non-dichotomised) data showed that four of the 12 mothers who reported wanting to stop betting but did not feel able to fell within the PGSI problem gambler classification and represented 100% of this group, whilst eight mothers fell within the PGSI moderate risk gambler classification and represented 80% of this group.

<u>Lying about gambling and/or bet or spent more money than intended and/or wanted to stop betting/gambling</u>
There were 18 mothers who responded positively to one or more of the three questions about lying to hide their gambling, betting or spending more money than intended on gambling, and wanting to stop betting/gambling but did not feel able to. Sixteen of these mothers fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 36% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). Two of the PGSI classified non-problem gamblers responded positively (Yes) to one or more of the three questions.

Review of the categorical (non-dichotomised) data showed that four of the 18 mothers who responded positively to one or more of these questions fell within the PGSI problem gambler classification and represented all (100%) of this group, nine mothers fell within the PGSI moderate risk gambler classification representing 90% of this group, and three mothers fell within the PGSI low risk gambler classification representing 10% of this group. Two of the mothers fell within the non-problem gambler classification representing 0.8% of this group.

3.2.5 Psychological distress

The impact of gambling on mothers' psychological distress (measured by the General Health Questionnaire - GHQ (Goldberg & Williams (1988)) was investigated. There was no significant association between mothers who gambled and psychological distress. When adjusted for a range of potential confounding variables, gambling during the past 12 months still failed to show any significant association with psychological distress. Similarly, there were no associations between the PGSI dichotomised at risk/problem gambler group and psychological distress. Data are presented in Table 11 and Table 12.

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[4] Although there were 15 mothers who responded positively to this question, a PGSI score was not available for one participant.

Table 11: Mothers - Numbers, percentages, and unadjusted and adjusted odds ratios for reported psychological distress (GHQ) and gambling

Variable	Category	Psychological distress				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Mother gambled	No	42	(6.9)	571	(93.1)	1.00		1.00	
	Yes	18	(5.2)	329	(94.8)	0.74	(0.42, 1.31)	0.85	(0.47, 1.55)

N=960 univariate analysis; N=937 multivariate analysis
† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, whether born in NZ, years lived in NZ, smoking and drinking

Table 12: Mothers - Numbers, percentages, unadjusted and adjusted odds ratios for reported psychological distress (GHQ) and PGSI score

Variable	Category	Psychological distress				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Mother at risk/problem gambler (PGSI)	No	10	(4.2)	229	(95.8)	1.00		1.00	
	Yes	2	(4.5)	42	(95.5)	1.09	(0.23, 5.16)	0.34	(0.04, 3.27)

N=283 univariate analysis; N=276 multivariate analysis
† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, whether born in NZ, years lived in NZ, smoking and drinking

3.2.6 Intimate partner violence

The impact of mothers' gambling on intimate partner violence (measured by the Conflict Tactics Scale - CTS (Straus (1979)) was investigated. The CTS assesses verbal aggression and physical violence where the mother is a perpetrator or victim.

There was no significant association between whether mothers gambled and being a perpetrator or victim of intimate partner violence. When adjusted for a range of potential confounding variables, gambling during the past 12 months still failed to show any significant association with intimate partner violence (Table 13).

There were no associations between the PGSI dichotomised at risk/problem gambler group and being a victim of intimate partner violence. When adjusted for potentially confounding variables mothers in the PGSI dichotomised at risk/problem gambler group were significantly *less likely* to report perpetrating violence than non-problem gamblers (Table 14).

Table 13: Mothers - Numbers, percentages, unadjusted and adjusted odds ratios for reported intimate partner violence (IPV) and gambling

Variable	Category	IPV				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Perpetration of verbal aggression									
Mother gambled	No	319	(63.7)	182	(36.3)	1.00		1.00	
	Yes	187	(65.6)	98	(34.4)	1.09	(0.80, 1.48)	1.34	(0.95, 1.88)
Victim of verbal aggression									
Mother gambled	No	278	(55.5)	223	(44.5)	1.00		1.00	
	Yes	165	(58.1)	119	(41.9)	1.11	(0.83, 1.49)	1.26	(0.92, 1.73)
Perpetration of physical violence									
Mother gambled	No	56	(11.2)	445	(88.8)	1.00		1.00	
	Yes	42	(14.7)	243	(85.3)	1.37	(0.89, 2.11)	1.55	(0.96, 2.48)
Victim of physical violence									
Mother gambled	No	28	(5.6)	473	(94.4)	1.00		1.00	
	Yes	23	(8.1)	262	(91.9)	1.48	(0.84, 2.63)	1.64	(0.88, 3.06)

N=786 univariate analysis; N=771 multivariate analysis

† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, whether born in NZ, years lived in NZ, smoking and drinking

Table 14: Mothers - Numbers, percentages, unadjusted and adjusted odds ratios for reported intimate partner violence (IPV) and PGSI score

Variable	Category	IPV				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Perpetration of verbal aggression									
Mother at risk/problem	No	125	(62.8)	74	(37.2)	1.00		1.00	
gambler (PGSI)	Yes	26	(74.3)	9	(25.7)	1.71	(0.76, 3.85)	1.58	(0.66, 3.79)
Victim of verbal aggression									
Mother at risk/problem	No	111	(55.8)	88	(44.2)	1.00		1.00	
gambler (PGSI)	Yes	24	(68.6)	11	(31.4)	1.73	(0.80, 3.72)	1.38	(0.59, 3.22)
Perpetration of physical violence									
Mother at risk/problem	No	29	(14.6)	170	(85.4)	1.00		1.00	
gambler (PGSI)	Yes	1	(2.9)	34	(97.1)	0.17	(0.02, 1.31)	0.05	(0.00, 0.91)*
Victim of physical violence									
Mother at risk/problem	No	18	(9.0)	181	(91.0)	1.00		1.00	
gambler (PGSI)	Yes	1	(2.9)	34	(97.1)	0.30	(0.04, 2.29)	0.28	(0.03, 2.27)

N=234 univariate analysis; N=230 multivariate analysis

* P < 0.05

† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, whether born in NZ, years lived in NZ, smoking and drinking

Further analyses identified that victims of minor violence during the past 12 months were significantly (P=0.05; OR=3.61) more likely to gamble during that time frame than those who were not exposed to any violence. Perpetrators of physical violence were more likely to fall within the upper quartile of weekly expenditure on gambling (≥$20) than non violent mothers (P=0.012; OR=2.36).

3.2.7 Child behaviour

The impact of mothers' gambling on the behaviour of their cohort child (measured by the Child Behaviour Check List - CBCL (Achenbach & Rescorla (2000)) was investigated. The CBCL is a parental report designed specifically to assess a range of preschool behaviour problems.

There was no statistically significant association between mothers who gambled and child behavioural problems (Table 15). Similarly, there were no associations between the PGSI dichotomised at risk/problem gambler group and child behavioural problems (Table 16).

Table 15: Mothers - Numbers, percentages, unadjusted and adjusted odds ratios for reported child behaviour problem and gambling

Variable	Category	Behaviour problem				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Mother gambling	No	57	(9.3)	556	(90.7)	1.00		1.00	
	Yes	36	(10.4)	311	(89.6)	1.13	(0.73, 1.75)	1.19	(0.74, 1.91)

N=960 univariate analysis; N=938 multivariate analysis
† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, whether born in NZ, years lived in NZ, smoking and drinking

Table 16: Mothers - Numbers, percentages, unadjusted and adjusted odds ratios for reported child behaviour problems and PGSI score

Variable	Category	Behaviour problem				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Mother at risk/problem gambler (PGSI)	No	29	(12.1)	210	(87.9)	1.00		1.00	
	Yes	2	(4.5)	42	(95.5)	0.35	(0.08, 1.50)	0.23	(0.04, 1.19)

N=283 univariate analysis; N=276 multivariate analysis
† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, whether born in NZ, years lived in NZ, smoking and drinking

3.3	Fathers: Descriptive statistics

This Section presents data for fathers including demographics, gambling activity and expenditure, whether the fathers had problems due to someone else's gambling, PGSI and SOGS-R scores and the internal consistency of these screens with this population, and the lying/ betting behaviour of the fathers who reported gambling. Where possible, information obtained at the six-year data collection point was used in the analyses; however, for some demographic information collected once only at baseline (e.g. ethnicity), the 12-month baseline data have been used.

3.3.1 Demographic data

Socio-demographic characteristics of the fathers are presented in Table 17.

Almost half of the fathers (48%) were of Samoan ethnicity, just under one quarter (23.5%) were Tongan, 13.4% Cook Island and the remainder were of other Pacific or non-Pacific ethnicity. Half (52.1%) were in the 30 to 39 year age bracket and the highest educational status of two-thirds (68.3%) of the fathers was secondary school qualification or less. The majority were partnered (97%), half (54.2%) had a weekly household income of $501 to $1,000, were not New Zealand born (79.1%) and half had lived in New Zealand for 11 or more years (85%). The cultural orientation of the fathers generally included retaining a high Pacific orientation (with low New Zealand orientation) (47.6%) or vice versa (24.3%) with the remainder either integrating well (high New Zealand, high Pacific) or integrating poorly (low New Zealand, low Pacific). Just over one third (37.9%) of the fathers smoked and about one fifth (18%) drank alcohol at a harmful level as assessed by the Alcohol Use Disorders Identification Test (AUDIT) (Saunders et al., 1993).

Table 17: Fathers - Socio-demographic characteristics

	N	(%)
Age (years)		
20 - 29	59	(10.0)
30 - 39	308	(52.1)
40+	224	(37.9)
Highest educational qualification		
Secondary school qual/No formal qualification	403	(68.3)
Post-school qualification	187	(31.7)
Ethnicity		
Samoan	272	(48.0)
Cook Island	76	(13.4)
Tongan	133	(23.5)
Other Pacific#	36	(6.3)
Non Pacific	50	(8.8)
Smoking status		
No	363	(62.1)
Yes	222	(37.9)
Alcohol use (AUDIT)		
No drinking/No harmful drinking	483	(82.0)
Harmful drinking	106	(18.0)
Marital status		
Partnered	575	(97.3)
Non partnered	16	(2.7)
Years lived in New Zealand		
6 - 10	53	(14.9)
11 - 20	190	(53.5)
>20	112	(31.6)
Household weekly income		
$0 - $500	85	(14.6)
$501 - $1,000	316	(54.2)
>$1,000	182	(31.2)
NZ born		
No	340	(79.1)
Yes	90	(20.9)
Cultural orientation		
High NZ, Low Pacific	143	(24.3)
Low NZ, High Pacific	280	(47.6)
High NZ, High Pacific	94	(16.0)
Low NZ, Low Pacific	71	(12.1)

N = 591

Numbers (and percentages) do not always total 591 (or 100%) due to missing values

Includes fathers identifying equally with two or more Pacific groups, equally with Pacific and non-Pacific groups, or with Pacific groups other than Tongan, Samoan or Cook Island

3.3.2 Gambling activity

Of the 591 fathers, 30% (n=176) stated that they had taken part in at least one form of gambling activity during the previous 12 months. One-quarter of all fathers had played Lotto (26%). Overall participation in other forms of gambling was low with six percent of fathers playing electronic gaming machines at a casino, five percent playing non-casino gaming machines (at a pub or club), and four percent playing Instant Kiwi. All other forms of gambling were participated in by three percent or less of the fathers. Data are presented in Figure 5. Actual numbers of fathers participating in each form of gambling activity are presented in Appendix 3.

Of the 176 fathers who gambled, almost all (88%) had played Lotto and one-fifth (20%) had played casino electronic gaming machines. Overall participation in other forms of gambling was lower with 15% playing non-casino gaming machines (at a pub or club), and 14% playing Instant Kiwi. All other forms of gambling were participated in by 10% or less of the fathers who gambled. Data are presented in Figure 6.

Of the 176 fathers who gambled, three-fifths (62%) only gambled on one activity with the remaining 38% gambling on multiple forms, ranging from two to seven. The most enjoyed gambling activity was Lotto (78%) followed by horse/dog race betting (6%) and sports betting at the TAB (5%). Each of the other forms of gambling was the most enjoyed activity by four percent or less of the fathers.

Figure 5: Fathers - Gambling per activity, percentage of all fathers
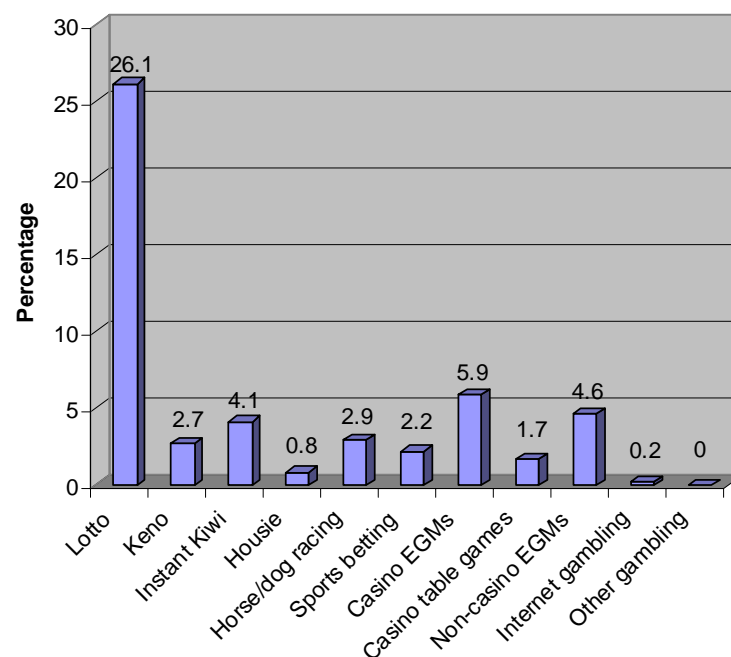
Figure 6: Fathers - Gambling per activity, percentage of fathers who gambled
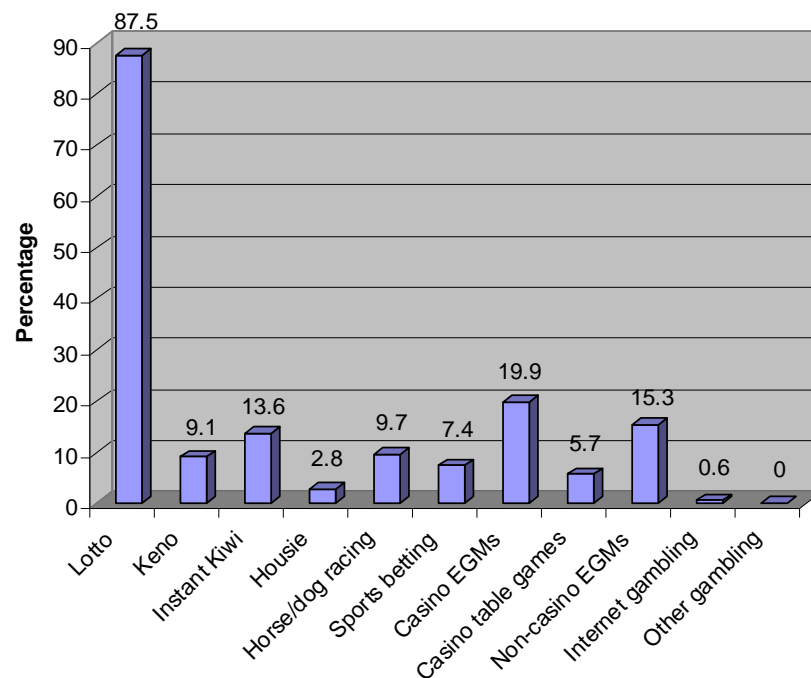
3.3.3 Gambling expenditure

The median monthly expenditure on gambling in the previous six months was $37.50 (range $2 to $1,210). There was considerable difference in mean expenditure per gambling type, with the greatest median monthly amount of $125 being spent on casino table games and the least ($8) being spent on Instant Kiwi. For the forms of gambling most participated in by the fathers, the median monthly expenditure was: Lotto $30, casino electronic gaming machines $80, and non-casino gaming machines $50. However, due to the small numbers of fathers participating in some of the gambling forms, these results must be viewed with caution. Findings for the main gambling activities are presented in Figure 7; some activities are not presented due to small or zero sample sizes.

Figure 7: Fathers - Median usual monthly expenditure per gambling activity
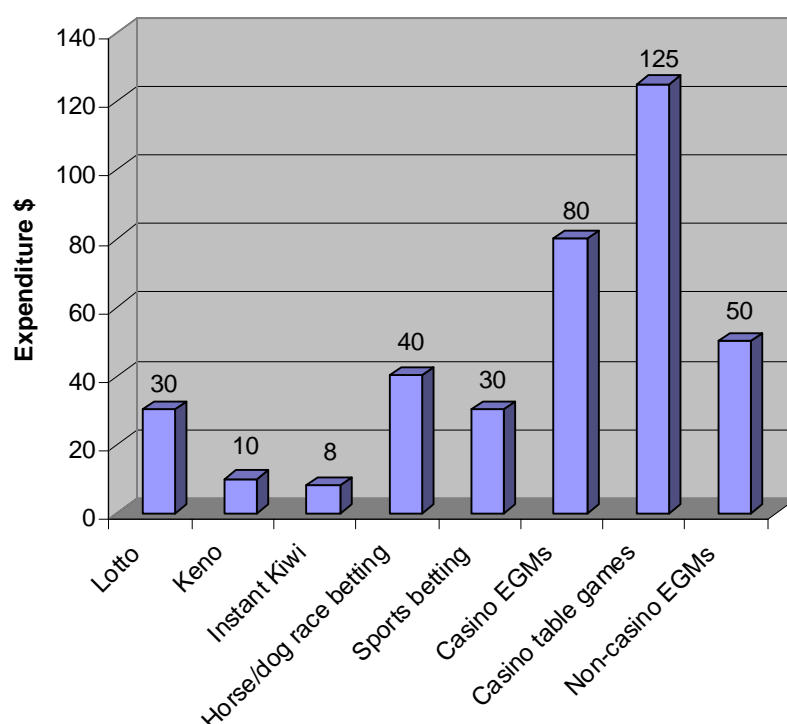
3.3.4 Problems due to someone else's gambling

Two percent (n=10) of all fathers (N=591) stated that they had experienced problems because of someone else's gambling in the previous 12 months. The forms of gambling which were causing problems were: electronic gaming machines at a casino (67%), non-casino electronic gaming machines (33%), Lotto (11%), Housie (11%), and casino table games (11%).

3.3.5 Problem Gambling Severity Index scores

Figure 8 presents the distribution of PGSI scores for the 176 fathers who had gambled in the previous 12 months.

The majority (72%, n=127) of fathers scored zero on the PGSI indicating non-problem gambler status. Low risk gamblers (PGSI score one or two) comprised 12.5% of fathers (n=22), moderate risk gamblers (PGSI score three to seven) comprised 9.6% of fathers (n=17), and 5.7% of the fathers who gambled were classified as problem gamblers (n=10). Although the potential range of score was zero to 27, the highest score was 15, indicating that no participant was in the very severe range of problem gambling.

Figure 8: Fathers - Distribution of PGSI scores
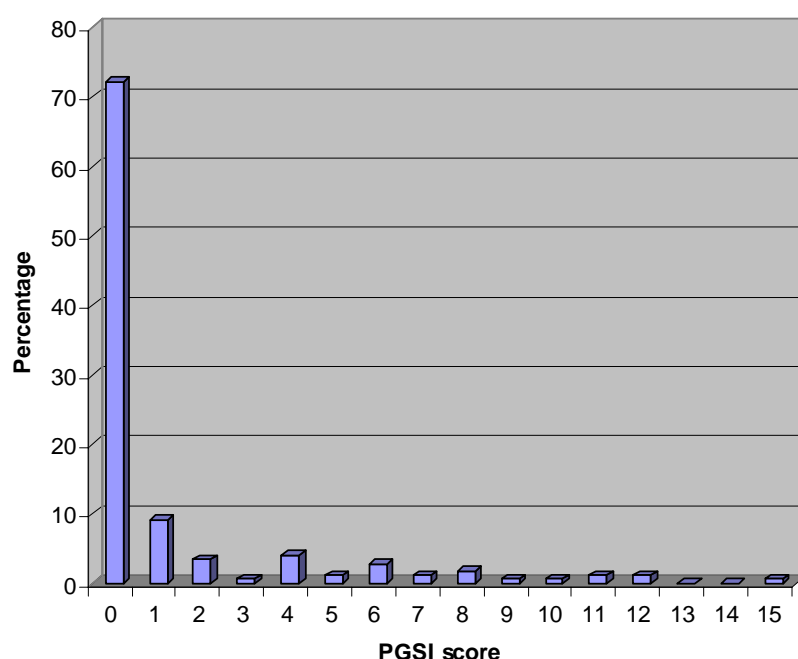
3.3.6 *Internal consistency of Problem Gambling Severity Index*

Cronbach's alpha was used to test internal consistency. The overall alpha value of 0.87 (Table 18) indicates a very good internal consistency (reliability). Table 17 shows the effect of deleting each individual item of the scale on Cronbach's alpha; two items detract slightly from the reliability of the questionnaire - Question 3: Thinking about the past 12 months, how often have you gone back another day to try to win back the money you lost?, and Question 4: … how often have you borrowed money or sold anything to get money to gamble?

Table 18: Fathers - PGSI Cronbach's alpha

PGSI items: Thinking about the past 12 months, how often…	**Cronbach's alpha if item deleted**
…have you bet more than you could really afford to lose?	0.85
…have you needed to gamble with larger amounts of money to get the same feeling of excitement?	0.86
…have you gone back another day to try to win back the money you lost?	0.88
…have you borrowed money or sold anything to get money to gamble?	0.88
…have you felt that you might have a problem with gambling?	0.85
…have people criticised your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?	0.87
…have you felt guilty about the way you gamble, or what happens when you gamble?	0.84
…has your gambling caused you any health problems, including stress or anxiety?	0.86
…has your gambling caused any financial problems for you or your household?	0.86
Overall	0.87

3.3.7 South Oaks Gambling Screen-Revised scores

Figure 9 presents the distribution of SOGS-R scores for the 167 fathers who had gambled in the previous six months and for whom valid data were available for each of the 20 scored SOGS-R questions.

The majority (90%, n=150) of fathers scored zero to two on the SOGS-R indicating non-problem gambler status. Potential pathological gamblers (SOGS-R score three or four) comprised 5.4% of fathers (n=9), and 4.8% of the fathers who gambled were categorised as probable pathological gamblers (n=8). Although the potential range of score was zero to 20, the highest score was 13.

Figure 9: Fathers - Distribution of SOGS-R scores
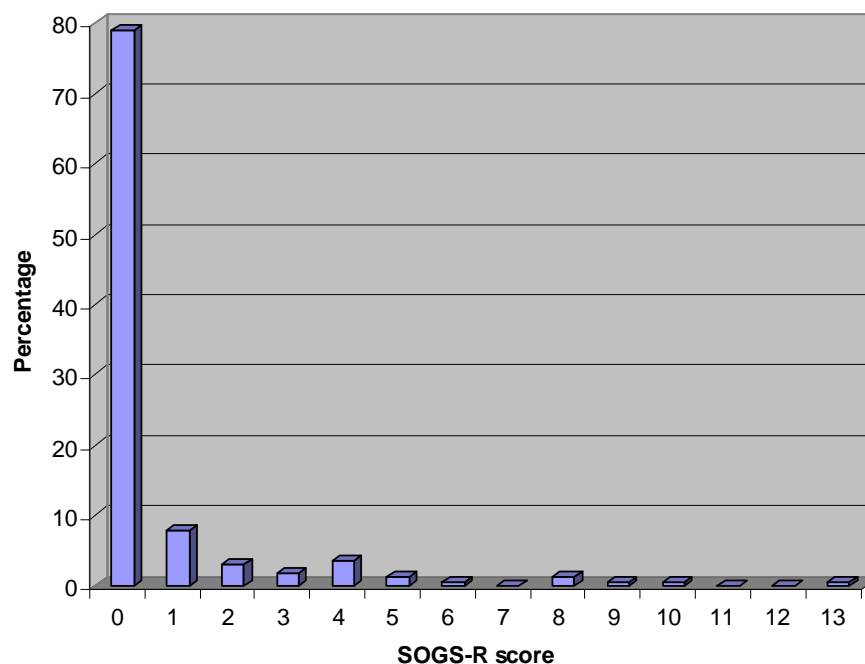
3.3.8 Internal consistency of South Oaks Gambling Screen-Revised

Cronbach's alpha was used to test internal consistency. The overall alpha value of 0.87 (Table 19) indicates a very good internal consistency (reliability). Table 18 shows the effect of deleting each individual item of the scale on Cronbach's alpha; no items had alphas over the overall value indicating that no questions detracted from the reliability of the questionnaire.

Table 19: Fathers - SOGS-R Cronbach's alpha

SOGS-R scored items: During the last six months… (questions abbreviated)	Cronbach's alpha if item deleted
…how often did you go back another day to win money you lost?	0.87
…did you ever claim to be winning money when in fact you lost it?	0.87
…did you ever spend either more time or money gambling than you intended?	0.86
…have people criticised your gambling?	0.85
…did you feel guilty about the way you gamble or what happens when you gamble?	0.86
…have you felt that you would like to stop gambling but didn't think that you could?	0.85
…have you ever hidden betting slips, lottery tickets, gambling money or other signs of gambling from your spouse or partner, children or other important people in your life?	0.86
…have any of your arguments about money centred on your gambling?	0.86
…have you missed time from work, school or study due to gambling?	0.87
…have you borrowed money from someone and not paid them back as a result of your gambling?	0.86
…have you borrowed from household money?	0.86
…have you borrowed money from your spouse or partner?	0.86
…have you borrowed money from other relatives or in-laws?	0.86
…have you had loans from banks, loan companies or other finance companies?	0.87
…have you had cash withdrawals on credit cards?	0.87
…have you had loans from loan sharks?	0.87
…have you cashed in shares, insurance policies or other securities?	0.87
…have you sold personal or family property?	0.87
…have you borrowed from your cheque account by writing cheques that bounced?	0.87
…do you feel that you have had a problem with gambling?	0.85
Overall	0.87

3.3.9 Lying and betting

Data were available for all 176 fathers who had gambled in the previous 12 months (Table 20). The majority of fathers reported that they had never lied to family members or others to hide their gambling (92%), had never bet or spent more money than they wanted to on gambling (87%), and had not wanted to stop betting money or gambling but did not think they could (86%). Between six and 11% of fathers reported 'sometimes' for lying, betting more than intended or wanting to stop gambling but not feeling able to; 'most of the time' was reported by two percent each for lying or betting more and by three percent of fathers for wanting to stop betting; and 'almost always' was reported by one percent of fathers each for lying, betting more and wanting to stop betting.

Table 20: Fathers - Numbers and percentages of lying and betting behaviour

	Never		Sometimes		Most of the time		Almost always	
	n	(%)	n	(%)	n	(%)	n	(%)
Lied to hide gambling	162	(92)	11	(6)	2	(1)	1	(1)
Bet/spent more than intended	153	(87)	20	(11)	2	(1)	1	(1)
Wanting to stop betting/gambling	152	(86)	17	(10)	6	(3)	1	(1)

3.4	Fathers: Association statistics

This Section presents data pertaining to the fathers of associations between gambling/problem gambling and specific socio-demographic variables, as well as associations between gambling/problem gambling and specific health outcomes (child behaviour, paternal psychological distress, and intimate partner violence). Finally, associations between the lying and betting questions, and the PGSI and SOGS-R are presented. Where possible, information obtained at the six-year data collection point were used in the analyses; however, for some demographic information collected once only at baseline (e.g. ethnicity), the 12-month baseline data have been used.

In regard to the PGSI, since there were limited numbers of low risk (n=22), moderate risk (n=17) and problem gamblers (n=10), this variable was dichotomised into non-problem gamblers (n=127) versus low risk/moderate risk/problem gamblers (n=49) for the analyses (rather than using a multinomial logistic regression). Similarly, for the SOGS-R, the variable was dichotomised into non-problem gambler (n=150) versus problem gambler (n=17) (comprising problem gambler, n=9; and probable pathological gambler, n=8).

Only the lying and betting questions have been analysed in relation to both the PGSI and SOGS-R dichotomised variables. All other associative statistics have only been performed against the PGSI, for comparative purposes with the data from the mothers (as the SOGS-R screen was not completed by mothers).

3.4.1 Gambling activity

Table 21 details univariate odds ratios of fathers gambling in the previous 12 months and associations with various socio-demographic variables. Statistical significance was attained between fathers' gambling participation and total net weekly household income, cultural orientation, smoking and harmful alcohol consumption (assessed using the AUDIT test).

Fathers who were in the higher total net weekly household income brackets (>$500) were more likely to gamble than fathers in the lower income bracket (<$501). Fathers retaining a high Pacific cultural orientation with low New Zealand orientation were half as likely to gamble than fathers identifying with a high New Zealand orientation and low Pacific orientation; however, fathers with both a low New Zealand and a low Pacific cultural orientation were three times more likely to gamble in the previous 12 months than fathers identifying with a high New Zealand orientation and low Pacific orientation. Fathers who smoked and fathers who drank alcohol at a harmful level were more likely to gamble than fathers who did not smoke or drink alcohol at a harmful level. The odds of gambling during the past 12 months were 1.6 times greater for fathers who smoked and 6.6 times greater for fathers who drank at a harmful level, compared with non-smokers/non-harmful drinkers. For comparative purposes with mothers' data, analyses were also performed on the two questions from the AUDIT that were also asked of mothers. These analyses showed that fathers who drank two to four times a month were 3.4 times more likely to gamble, and fathers who drank two to three times a week or more were 5.1 times more likely to gamble, in comparison with non-drinkers. Additionally, the likelihood of gambling increased with increasing number of drinks consumed on a typical day, from 2.6 times more likely for those fathers having one to two drinks, to 4.1 times more likely for those fathers having seven or more drinks on a typical day.

In the multivariate logistic regression analyses, household income, cultural orientation and harmful alcohol consumption retained significant associations with gambling activity. However, statistical significance was not attained (just missed) for smoking. In addition, fathers aged 30 or more years were statistically more likely to gamble in comparison with those aged 20 to 29 years (Table 22).

Table 21: Fathers - Numbers, percentages and univariate odds ratios for gambling

Variable	Category	Gambled in the past 12 months				Univariate odds ratio	
		Yes	(%)	No	(%)	OR	(95% CI)
Age (years)	20 - 29	13	(22.0)	46	(78.0)	1.00	
	30 - 39	95	(30.8)	213	(69.2)	1.58	(0.82, 3.06)
	40+	68	(30.4)	156	(69.6)	1.54	(0.78, 3.04)
Ethnicity	Samoan	80	(29.4)	192	(70.6)	1.00	
	Cook Island	24	(31.6)	52	(68.4)	1.11	(0.64, 1.92)
	Tongan	36	(27.1)	97	(72.9)	0.89	(0.56, 1.42)
	Other Pacific[#]	14	(38.9)	22	(61.1)	1.53	(0.74, 3.14)
	Non Pacific	16	(32.0)	34	(68.0)	1.13	(0.59, 2.16)
Social marital status	Partnered	170	(29.6)	405	(70.4)	1.00	
	Non-partnered	6	(37.5)	10	(62.5)	1.43	(0.51, 4.00)
Education	Secondary school qualification/No formal qualifications	116	(28.8)	287	(71.2)	1.00	
	Post school qualification	60	(32.1)	127	(67.9)	1.17	(0.80, 1.70)
Household income	$0 - $500	16	(18.8)	69	(81.2)	1.00	
	$501 - $1,000	96	(30.4)	220	(69.6)	1.88	(1.04, 3.41)*
	>$1,000	60	(33.0)	122	(67.0)	2.12	(1.14, 3.96)*
Born in NZ	No	96	(28.2)	244	(71.8)	1.00	
	Yes	27	(30.0)	63	(70.0)	1.09	(0.66, 1.81)
Cultural orientation	High NZ, Low Pacific	47	(32.9)	96	(67.1)	1.00	
	Low NZ, High Pacific	56	(20.0)	224	(80.0)	0.51	(0.32, 0.81)**
	High NZ, High Pacific	29	(30.9)	65	(69.1)	0.91	(0.52, 1.60)
	Low NZ, Low Pacific	42	(59.2)	29	(40.8)	2.96	(1.64, 5.33)***
Smoking status	No	94	(25.9)	269	(74.1)	1.00	
	Yes	79	(35.6)	143	(64.4)	1.58	(1.10, 2.27)*
Alcohol (AUDIT)	No drinking/No harmful drinking	107	(22.2)	376	(77.8)	1.00	
	Harmful drinking	69	(65.1)	37	(34.9)	6.55	(4.16, 10.31)***
Alcohol consumption (frequency)	Never	45	(16.4)	229	(83.6)	1.00	
	2-4 times a month or less	107	(39.9)	161	(60.1)	3.38	(2.26, 5.06)***
	2-3 times a week or more	24	(50.0)	24	(50.0)	5.09	(2.66, 9.75)***
Alcohol consumption (number drinks)	Nil (non drinker)	45	(16.4)	229	(83.6)	1.00	
	1 or 2	18	(34.0)	35	(66.0)	2.62	(1.36, 5.02)**
	3 to 6	58	(41.4)	82	(58.6)	3.60	(2.26, 5.72)***
	7 or more	55	(44.7)	68	(55.3)	4.12	(2.55, 6.64)***

N=591; numbers will vary due to missing data for some variables
* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$
[#] Includes fathers identifying equally with two or more Pacific groups, equally with Pacific and non-Pacific groups or with Pacific groups other than Tongan, Samoan or Cook Island

Table 22: Fathers - Adjusted odds ratios for gambling

Variable	Category	Adjusted odds ratio	
		OR	(95% CI)
Age (years)	20 - 29	1.00	
	30 - 39	3.17	(1.41, 7.09)**
	40+	4.15	(1.78, 9.67)**
Household income	$0 - $500	1.00	
	$501 - $1,000	2.29	(1.11, 4.69)*
	>$1,000	2.20	(1.03, 4.72)*
Cultural orientation	High NZ, Low Pacific	1.00	
	Low NZ, High Pacific	0.49	(0.29, 0.85)*
	High NZ, High Pacific	0.86	(0.46, 1.62)
	Low NZ, Low Pacific	2.78	(1.39, 5.56)**
Smoking status	No	1.00	
	Yes	1.41	(0.92, 2.15)
Alcohol (AUDIT)	No drinking/No harmful drinking	1.00	
	Harmful drinking	6.34	(3.78, 10.63)***

N=553
Nagelkerke R^2=26.2%, Hosmer-Lemeshow goodness-of-fit P-value=0.922
* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

3.4.2 Gambling expenditure

Table 23 details univariate odds ratios of fathers spending $60 or more (upper quartile of expenditure) per month on gambling in the previous 12 months and associations with various socio-demographic variables. No statistically significant differences were noted with any of the variables examined.

Table 23: Fathers - Numbers, percentages and univariate odds ratios of ≥$60 per month expenditure

Variable	Category	Spending ≥NZ$60 per month				Univariate odds ratio	
		Yes	(%)	No	(%)	OR	(95% CI)
Age (years)	20 - 39	33	(30.6)	75	(69.4)	1.00	
	40+	20	(29.4)	48	(70.6)	0.95	(0.49, 1.84)
Ethnicity	Samoan	22	(27.5)	58	(72.5)	1.00	
	Cook Island	8	(33.3)	16	(66.7)	1.32	(0.50, 3.51)
	Tongan	13	(36.1)	23	(63.9)	1.49	(0.64, 3.45)
	Other Pacific#	4	(28.6)	10	(71.4)	1.06	(0.30, 3.71)
	Non Pacific	4	(25.0)	12	(75.0)	0.88	(0.26, 3.02)
Social marital status	Partnered	51	(30.0)	119	(70.0)	1.00	
	Non-partnered	2	(33.3)	4	(66.7)	1.17	(0.21, 6.57)
Education	Secondary school qualification/No formal qualifications	39	(33.6)	77	(66.4)	1.00	
	Post school qualification	14	(23.3)	46	(76.7)	0.60	(0.30, 1.22)
Household income	$0 - $500	4	(25.0)	12	(75.0)	1.00	
	$501 - $1,000	28	(29.2)	68	(70.8)	1.24	(0.37, 4.16)
	>$1,000	19	(31.7)	41	(68.3)	1.39	(0.40, 4.87)
	Unknown						
Born in NZ	No	30	(31.2)	66	(68.8)	1.00	
	Yes	6	(22.2)	21	(77.8)	0.63	(0.23, 1.72)
Cultural orientation	High NZ, Low Pacific	17	(36.2)	30	(63.8)	1.00	
	Low NZ, High Pacific	13	(23.2)	43	(76.8)	0.53	(0.23, 1.26)
	High NZ, High Pacific	7	(24.1)	22	(75.9)	0.56	(0.20, 1.59)
	Low NZ, Low Pacific	16	(38.1)	26	(61.9)	1.09	(0.46, 2.57)
Smoking status	No	33	(35.1)	61	(64.9)	1.00	
	Yes	20	(25.3)	49	(74.7)	0.63	(0.32, 1.21)
Alcohol (AUDIT)	No drinking/no harmful drinking	29	(27.1)	78	(72.9)	1.00	
	Harmful drinking	24	(34.8)	45	(65.2)	1.43	(0.75, 2.76)
Alcohol consumption (frequency)	Never	12	(26.7)	33	(73.3)	1.00	
	2-4 times a month or less	34	(31.8)	73	(68.2)	1.28	(0.59, 2.78)
	2-3 times a week or more	7	(29.2)	17	(70.8)	1.13	(0.38, 3.40)
Alcohol consumption (number drinks)	Nil (non drinker)	12	(26.7)	33	(73.3)	1.00	
	1 or 2	7	(38.9)	11	(61.1)	1.75	(0.55, 5.56)
	3 to 6	16	(27.6)	42	(72.4)	1.05	(0.44, 2.52)
	7 or more	18	(32.7)	37	(67.3)	1.34	(0.56, 3.19)

N=176; numbers will vary due to missing data for some variables

No statistical significance attained (p>0.05)

Includes fathers identifying equally with two or more Pacific groups, equally with Pacific and non-Pacific groups or with Pacific groups other than Tongan, Samoan or Cook Island

Fathers with weekly gambling expenditure in the upper quartile (≥$60) were six times more likely to be in the low risk/moderate risk/problem gambler category than fathers with lower weekly gambling expenditure (Table 24).

Table 24: Fathers - Numbers, percentages and univariate odds ratios of being at risk/ problem gamblers and expenditure

Variable	Category	At risk/problem gambler				Univariate odds ratio	
		Yes	(%)	No	(%)	OR	(95% CI)
Monthly expenditure	<60	20	(16.3)	103	(83.7)	1.00	
	≥$60	29	(54.7)	24	(45.3)	6.22	(3.02, 12.82)***

N=176
*** *P* < 0.001

3.4.3 Problem Gambling Severity Index

Table 25 details univariate odd ratios of fathers being low/moderate risk gamblers or problem gamblers associated with various socio-demographic variables. The only level of statistical significance attained was for fathers with a total net weekly household income of greater than $1,000 who were less likely to be at risk/problem gamblers compared with fathers in the lowest income bracket ($500 or less).

In the multivariate logistic regression analyses, household income retained a significant association with at risk/problem gambling (Table 26).

Table 25: Fathers - Numbers, percentages and univariate odds ratios of being at risk/problem gamblers

Variable	Category	At risk/problem gambler				Univariate odds ratio	
		Yes	(%)	No	(%)	OR	(95% CI)
Age (years)†	20 - 29	0	(0)	13	(100)		
	30 - 39	27	(28.4)	68	(71.6)		
	40+	22	(32.4)	46	(67.6)		
Age (years)	20 - 39	27	(25.0)	81	(75.0)	1.00	
	40+	22	(32.4)	46	(67.6)	1.44	(0.74, 2.80)
Ethnicity	Samoan	21	(26.3)	59	(73.8)	1.00	
	Cook Island	8	(33.3)	16	(66.7)	1.41	(0.53, 3.76)
	Tongan	13	(36.1)	23	(63.9)	1.59	(0.68, 3.69)
	Other Pacific#	2	(14.3)	12	(85.7)	0.47	(0.10, 2.27)
	Non Pacific	3	(18.8)	13	(81.3)	0.65	(0.17, 2.50)
Social marital status	Partnered	46	(27.1)	124	(72.9)	1.00	
	Non-partnered	3	(50.0)	3	(50.0)	2.70	(0.53, 13.84)
Education	Secondary school qualification/No formal qualification	36	(31.0)	80	(69.0)	1.00	
	Post school qualification	13	(21.7)	47	(78.3)	0.62	(0.30, 1.28)
Household income	$0 - $500	7	(43.8)	9	(56.3)	1.00	
	$501 - $1,000	31	(32.3)	65	(67.7)	0.61	(0.21, 1.80)
	>$1,000	9	(15.0)	51	(85.0)	0.23	(0.07, 0.77)*
Born in NZ	No	30	(31.3)	66	(68.8)	1.00	
	Yes	5	(18.5)	22	(81.5)	0.50	(0.17, 1.45)
Cultural orientation	High NZ, Low Pacific	12	(25.5)	35	(74.5)	1.00	
	Low NZ, High Pacific	13	(23.2)	43	(76.8)	0.88	(0.36, 2.18)
	High NZ, High Pacific	6	(20.7)	23	(79.3)	0.76	(0.25, 2.31)
	Low NZ, Low Pacific	18	(42.9)	24	(57.1)	2.19	(0.89, 5.36)
Smoking status	No	23	(24.5)	71	(75.5)	1.00	
	Yes	26	(32.9)	53	(67.1)	1.51	(0.78, 2.94)
Alcohol (AUDIT)	No drinking/No harmful drinking	26	(24.3)	81	(75.7)	1.00	
	Harmful drinking	23	(33.3)	46	(66.7)	1.56	(0.80, 3.04)

N=176; numbers will vary due to missing data for some variables

* $P < 0.05$

Includes fathers identifying equally with two or more Pacific groups, equally with Pacific and non-Pacific groups or with Pacific groups other than Tongan, Samoan or Cook Island

† Risk estimates could not be computed due to empty cells. Thus, the analysis was re-run collapsing the 20 - 29 and 30 - 39 age categories

Table 26: Fathers - Adjusted odds ratios of being at risk/problem gamblers

Variable	Category	Adjusted odds ratio	
		OR	(95% CI)
Household income	$0 - $500	1.00	
	$501 - $1,000	0.62	(0.19, 2.05)
	>$1,000	0.22	(0.06, 0.85)*
Cultural orientation	High NZ, Low Pacific	1.00	
	Low NZ, High Pacific	0.64	(0.23, 1.81)
	High NZ, High Pacific	0.98	(0.30, 3.17)
	Low NZ, Low Pacific	2.25	(0.84, 5.99)

N=163
Nagelkerke R^2=12.6%, Hosmer-Lemeshow goodness-of-fit P-value=0.797
* $P < 0.05$

3.4.4 Agreement between PGSI and SOGS-R

There was good agreement between the two problem gambling screens with 94% of fathers identified as problem gamblers using the SOGS-R also being classified as at risk/problem gamblers with the PGSI. Six percent of fathers identified as a problem gambler using the SOGS-R (n=1) were identified as a non-problem gambler using the PGSI.

3.4.5 Lying and betting associated with Problem Gambling Severity Index

Due to the small sample sizes, responses to the lying and betting questions have been dichotomised to 'Yes/No' (i.e. the 'Sometimes', 'Most of the time' and 'Almost always' responses equate to 'Yes' and the 'never' responses equate to 'No').

Lying about gambling
Thirteen of the 14 fathers who had responded positively (Yes) to the question about lying to hide their gambling fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 27% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). One of the PGSI classified non-problem gamblers responded positively (Yes) to the question about lying; this represented less than one percent of the non-problem gamblers.

Review of the categorical (non-dichotomised) data showed that eight of the fathers who reported lying fell within the PGSI problem gambler classification and represented 80% of this group, three fathers who reported lying fell within the PGSI moderate risk gambler classification representing 18% of this group, and two fathers fell within the PGSI low risk gambler group representing nine percent of this group.

Bet or spent more money than intended
All 23 fathers who had responded positively (Yes) to the question about betting or spending more money than intended on gambling fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 47% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). None of the PGSI classified non-problem gamblers responded positively (Yes) to the question about betting or spending more money than intended on gambling.

Review of the categorical (non-dichotomised) data showed that nine fathers who reported betting/spending more money than intended fell within the PGSI problem gambler classification and represented 90% of this group, nine fathers fell within the PGSI moderate risk gambler classification and represented 53% of this group, and five fathers fell within the PGSI low risk gambler classification and represented 23% of this group.

Lying about gambling and/or bet or spent more money than intended
There were 25 fathers who responded positively to one or both of the questions about lying to hide their gambling, and betting or spending more money than intended on gambling. Twenty-four of these fathers fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 49% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). One of the PGSI classified non-problem gamblers responded positively (Yes) to either/both of the questions about lying or betting/spending more money than intended, representing 0.8% of that group.

Review of the categorical (non-dichotomised) data showed that 10 of the 25 fathers who responded positively to one or both of these questions fell within the PGSI problem gambler classification and represented all (100%) of this group, nine fathers fell within the PGSI moderate risk gambler classification representing 53% of this group, and five fathers fell within the PGSI low risk gambler classification representing 23% of this group.

Wanted to stop betting/gambling
All 24 fathers who had responded positively (Yes) to the question about wanting to stop betting/gambling but did not feel able to, fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 49% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). None of the PGSI classified non-problem gamblers responded positively (Yes) to the question about wanting to stop betting/gambling.

Review of the categorical (non-dichotomised) data showed that nine fathers who reported wanting to stop betting/gambling but did not feel able to fell within the PGSI problem gambler classification and represented 90% of this group, 12 fathers fell within the PGSI moderate risk gambler classification and represented 71% of this group, and three fathers fell within the PGSI low risk gambler classification representing 14% of this group.

Lying about gambling and/or bet or spent more money than intended and/or wanted to stop betting/gambling
There were 30 fathers who responded positively to one or more of the three questions about lying to hide their gambling, betting or spending more money than intended on gambling, and wanting to stop betting/gambling but did not feel able to. Twenty-nine of these fathers fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 59% of the at risk/problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). One of the PGSI classified non-problem gamblers responded positively (Yes) to one or more of the three questions, representing 0.8% of this group.

Review of the categorical (non-dichotomised) data showed that 10 of the 30 fathers who responded positively to one or more of these questions fell within the PGSI problem gambler classification and represented all (100%) of this group, 13 fathers fell within the PGSI moderate risk gambler classification representing 77% of this group, and six fathers fell within the PGSI low risk gambler classification representing 27% of this group. One of the fathers fell within the non-problem gambler classification.

3.4.6 Lying and betting associated with SOGS-R

Lying about gambling
Nine of the 14 fathers who had responded positively (Yes) to the question about lying to hide their gambling fell within the problem gambler SOGS-R dichotomised classification; this represented 53% of the problem gamblers. The association is significant (Fisher's Exact Test, P=0.000). Four of the SOGS-R classified non-problem gamblers responded positively (Yes) to the question about lying; this represented three percent of the non-problem gamblers.

Review of the categorical (non-dichotomised) data showed that seven fathers who reported lying fell within the SOGS-R probable pathological gambler classification and represented 88% of this group, whilst two fathers who reported lying fell within the SOGS-R problem gambler classification and represented 22% of this group.

Bet or spent more money than intended
Twelve fathers who had responded positively (Yes) to the question about betting or spending more money than intended on gambling fell within the problem gambler SOGS-R dichotomised classification; this represented 71% of the problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). Eight of the SOGS-R classified non-problem gamblers responded positively (Yes) to the question about betting or spending more money than intended on gambling; this represented five percent of the non-problem gamblers.

Review of the categorical (non-dichotomised) data showed that seven fathers who reported betting/spending more than intended fell within the SOGS-R probable pathological gambler classification and represented 88% of this group, whilst five fathers fell within the SOGS-R problem gambler classification and represented 56% of this group.

Wanted to stop betting/gambling
Thirteen fathers who had responded positively (Yes) to the question about wanting to stop betting/gambling but did not feel able to, fell within the problem gambler SOGS-R dichotomised classification; this represented 77% of the problem gamblers. The association is significant (Fisher's Exact Test, P<0.001). Eight of the SOGS-R classified non-problem gamblers responded positively (Yes) to the question about wanting to stop betting/gambling; this represented five percent of the non-problem gamblers.

Review of the categorical (non-dichotomised) data showed that seven fathers who reported wanting to stop betting/gambling but did not feel able to fell within the SOGS-R probable pathological gambler classification and represented 88% of this group, whilst six fathers fell within the SOGS-R problem gambler classification and represented 67% of this group.

3.4.7 Psychological distress

The impact of gambling on fathers' psychological distress (measured by the General Health Questionnaire - GHQ) was investigated. Fathers who gambled were significantly more likely (2.5 times) to exhibit psychological distress than fathers who did not gamble. When adjusted for a range of potential confounding variables, gambling during the past 12 months retained a significant association with psychological distress (Table 27). Fathers who were categorised as at risk/problem gamblers by the PGSI were 2.2 times more likely to report psychological distress than non-problem gamblers, though a level of statistical significance was not attained (Table 28).

Table 27: Fathers - Numbers, percentages, and unadjusted and adjusted odds ratios for reported psychological distress (GHQ) and gambling

Variable	Category	Psychological distress				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Father gambled	No	21	(5.1)	394	(94.9)	1.00		1.00	
	Yes	21	(11.9)	155	(88.1)	2.54	(1.35, 4.79)**	2.46	(1.30, 4.67)**

N=584 univariate analysis; N=553 multivariate analysis

** *P* < 0.01

† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, smoking and drinking

Table 28: Fathers - Numbers, percentages, and unadjusted and adjusted odds ratios for reported psychological distress (GHQ) and PGSI

Variable	Category	Psychological distress				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Father at risk/problem gambler (PGSI)	No	12	(9.4)	115	(90.6)	1.00		1.00	
	Yes	9	(18.4)	40	(81.6)	2.16	(0.85, 5.50)	2.21	(0.86, 5.67)

N=175 univariate analysis; N=163 multivariate analysis

† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, smoking and drinking

3.4.8 Intimate partner violence

The impact of fathers' gambling on intimate partner violence (measured by the Conflict Tactics Scale - CTS) was investigated. The CTS assess verbal aggression and physical violence where the father is a perpetrator or victim.

Fathers who gambled were significantly more likely to be perpetrators *and* victims of verbal aggression and physical violence than fathers who did not gamble. When adjusted for a range of potential confounding variables, gambling during the past 12 months retained a significant association with being a victim (but not a perpetrator) of verbal aggression (Table 29). Fathers who were categorised as at risk/problem gamblers by the PGSI were more than three times as likely to report perpetrating physical violence than fathers who were categorised as non-problem gamblers (Table 30).

Table 29: Fathers - Numbers, percentages, and unadjusted and adjusted odds ratios for reported intimate partner violence (IPV) and gambling

Variable	Category	IPV				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Perpetration of verbal aggression									
Father gambled	No	310	(75.8)	99	(24.2)	1.00		1.00	
	Yes	156	(89.7)	18	(10.3)	2.77	(1.62, 4.74)***	1.76	(0.95, 3.23)
Victim of verbal aggression									
Father gambled	No	294	(71.9)	115	(28.1)	1.00		1.00	
	Yes	154	(88.5)	20	(11.5)	3.01	(1.80, 5.03)***	2.24	(1.28, 3.92)**
Perpetration of physical violence									
Father gambled	No	44	(10.8)	365	(89.2)	1.00		1.00	
	Yes	35	(20.1)	139	(79.9)	2.09	(1.29, 3.39)**	1.60	(0.92, 2.77)
Victim of physical violence									
Father gambled	No	33	(8.1)	376	(91.9)	1.00		1.00	
	Yes	25	(14.4)	149	(85.6)	1.91	(1.10, 3.32)*	1.35	(0.70, 2.58)

N=583 univariate analysis; N=547 multivariate analysis

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, smoking and drinking

Table 30: Fathers - Numbers, percentages, and unadjusted and adjusted odds ratios for reported intimate partner violence (IPV) and PGSI

Variable	Category	IPV				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Perpetration of verbal aggression									
Father at risk/problem	No	113	(89.7)	13	(10.3)	1.00		1.00	
gambler (PGSI)	Yes	43	(89.6)	5	(10.4)	0.99	(0.33, 2.94)	0.84	(0.23, 3.04)
Victim of verbal aggression									
Father at risk/problem	No	111	(88.1)	15	(11.9)	1.00		1.00	
gambler (PGSI)	Yes	43	(89.6)	5	(10.4)	1.16	(0.40, 3.39)	1.03	(0.32, 3.31)
Perpetration of physical violence									
Father at risk/problem	No	19	(15.1)	107	(84.9)	1.00		1.00	
gambler (PGSI)	Yes	16	(33.3)	32	(66.7)	2.82	(1.30, 6.10)**	3.48	(1.40, 8.64)**
Victim of physical violence									
Father at risk/problem	No	14	(11.1)	112	(88.9)	1.00		1.00	
gambler (PGSI)	Yes	11	(22.9)	37	(77.1)	2.38	(0.99, 5.69)	3.11	(0.84, 11.57)

N=174 univariate analysis; N=161 multivariate analysis

** $P < 0.01$

† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, smoking and drinking

3.4.9 Child behaviour

The impact of fathers' gambling on the behaviour of their cohort child (measured by the Child Behaviour Check List - CBCL) was investigated. The CBCL is a parental report designed specifically to assess a range of preschool behaviour problems. The CBCL was completed by the mother of the cohort child.

There was no significant association between fathers who gambled and child behavioural problems (Table 31). Similarly, there were no associations between the PGSI dichotomised at risk/problem gambler group and child behavioural problems (Table 32).

Table 31: Fathers - Numbers, percentages, and unadjusted and adjusted odds ratios for reported child behaviour problem and gambling

Variable	Category	Behaviour problem				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Father gambled	No	36	(8.7)	379	(91.3)	1.00		1.00	
	Yes	13	(7.4)	162	(92.6)	0.85	(0.44, 1.64)	0.75	(0.36, 1.57)

N=590 univariate analysis; N=552 multivariate analysis
† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, smoking and drinking

Table 32: Fathers - Numbers, percentages, and unadjusted and adjusted odds ratios for reported child behaviour problem and PGSI

Variable	Category	Behaviour problem				Univariate odds ratio		Adjusted odds ratio†	
		Yes	(%)	No	(%)	OR	(95% CI)	OR	(95% CI)
Father at risk/problem gambler (PGSI)	No	9	(7.1)	117	(92.9)	1.00		1.00	
	Yes	4	(8.2)	45	(91.8)	1.16	(0.34, 3.94)	1.19	(0.29, 4.98)

N=175 univariate analysis; N=162 multivariate analysis
† Adjusted by age, ethnicity, education, marital status, household income, cultural orientation, smoking and drinking

4. DISCUSSION

The purpose of this project was to enhance and add value to the existing longitudinal Pacific Islands Families study by incorporating a substantial gambling component in the six-year data collection phase. The objective was for a cross-sectional assessment of gambling activity and expenditure within this Pacific cohort including problem gambling prevalence, and to look at associations between gambling/problem gambling and specific socio-demographic variables and health outcomes. If gambling continues to be included in subsequent data collection waves, this will give the potential to identify risk and protective factors in the development of problem gambling within a Pacific population. This will be through time tracking of potential predictors for problem gambling amongst the cohort parents, and also amongst the cohort children, once they are of an age at which they can be surveyed directly. In this phase, all gambling questions were included within the main questionnaire protocol for fathers. For the mothers, due to the large response burden, the gambling participation questions were included within the main protocol with the remaining questions included in a supplementary questionnaire which was only asked of mothers who indicated at the main protocol interview, that they gambled. Results from the analyses of gambling questions and related associations (separately for mothers and fathers) are presented in Chapter 3 of this report. In this Chapter, the key findings are drawn together and their importance discussed. Policy and service implications are also indicated.

4.1 Gambling participation

Gambling participation amongst the parents was low with only 36% of mothers and 30% of fathers reporting that they had taken part in at least one gambling activity during the previous 12 months. Thus, 64% of mothers and 70% of fathers reported not gambling. This is substantially higher than detailed in the 1999 national prevalence survey, where 20% of Pacific respondents reported having not gambled in the previous six months[5] (Abbott & Volberg, 2000). However, the findings from the current PIF study are similar to the Pacific Drugs and Alcohol Consumption Survey 2003 where 62% of females and 61% of males reported that they had not gambled (generically) with 79% reporting that they had not gambled in the previous week (Pacific Research and Development Services and SHORE/ Whariki, 2004). The 2002/03 New Zealand Health Survey found that 46% of Pacific respondents had not gambled in the previous 12 months[6] (Ministry of Health, 2006) whilst the 2005 participation and attitudes to gambling survey reported 36% (Department of Internal Affairs, 2008).

It is thus apparent that non-gambling participation amongst Pacific peoples is relatively high (though varied dependent on the populations sampled). National general population estimates of non-gambling vary from 14% to 46% (Abbott & Volberg, 2000; Department of Internal Affairs, 2008; Ministry of Health, 2006). At this stage, the reason for the particularly high non-gambling participation rate amongst parents in the PIF cohort remains unclear. One of the reasons could be due to the presence of young child/ren; a qualitative New Zealand study of regular and problem gamblers reported that for one-quarter of participants, the birth of a child reduced their gambling activity (Abbott & Volberg, 1992). This might be partly supported by the observation that 64% of PIF cohort mothers reported not gambling at the six-year data collection point, in comparison with 70% six years earlier when the children

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[5] These results are indicative rather than being directly comparable due to the different time frames for gambling activity, i.e. 12 versus six months.
[6] Data not reported for males and females separately.

were six-weeks old (Bellringer et al., 2006); similarly 70% of fathers had not gambled at the six-year point in comparison with 74% four years earlier at the two-year data collection point (unpublished data). It may be that participation rates will increase in future as the present cohort ages.

Of the mothers and fathers who had gambled during the previous 12 months, Lotto was the form of gambling most played (89% mothers, 88% fathers), with much lower levels of participation in other forms of gambling. Gender differences were apparent for the non-Lotto forms of gambling with mothers participating in Housie and Instant Kiwi gambling (both at 11%) and fathers participating in casino electronic gaming machines (EGMs) (20%), non-casino EGMs (15%) and Instant Kiwi (14%) gambling. Interestingly, the most preferred forms of gambling were not always the most participated forms. For mothers the most preferred forms were Lotto (80% of gamblers) followed by Housie (9%); for fathers the most preferred forms were Lotto (78%), followed by horse/dog race betting (6%) and sports betting at the TAB (5%). These preferential differences could reflect different gender stereotypes; for example Housie is a more social activity and could thus be more favoured by females, whilst horse/dog race betting and sports betting are traditionally more masculine activities.

Median expenditure on gambling was \$11/week for mothers and \$37.5/month for fathers. Unfortunately, mothers and fathers were not asked the question in the same time frame. If mothers' expenditure is multiplied by 52 (weeks), this gives an annual median of \$572; for fathers the figure is \$450 (\$37.5 x 12 months). For mothers, median expenditure was greater than reported in the 2005 participation and attitudes survey (\$455 for Pacific peoples) but similar for fathers (Department of Internal Affairs, 2008). However, median expenditure for the PIF parents was different for different forms of gambling. The highest expenditure was \$26/week for mothers' Housie gambling and \$125/month for fathers' casino table game playing. Expenditure varies according to type of gambling though the reported amounts for the current study[7] are substantially higher than those reported in the 1999 national prevalence survey (\$28/month for Housie and for casino table games) (Abbott, 2001). Whilst the expenditures detailed are not directly comparable due to different time frames and question wording, they do indicate support for a bimodal distribution of gambling amongst Pacific peoples in New Zealand (Abbott & Volberg, 2000). A bimodal distribution is where the population group contains proportionately larger numbers of non- or infrequent gamblers as well as a smaller proportion of gamblers who participate frequently and with a higher than usual average expenditure.

Ethnic differences appeared to be associated with gambling participation amongst mothers but were not a factor with fathers, with Tongan mothers being half as likely to gamble in comparison with Samoan mothers. However, cultural differences were associated with gambling participation both for mothers and fathers, though different findings were apparent for the sexes. Mothers who retained their Pacific cultural orientation as well as identifying with a New Zealand cultural orientation were 1.8 times more likely to gamble than mothers who only retained a low Pacific cultural orientation (with high New Zealand cultural orientation). Fathers retaining a high Pacific cultural orientation with low New Zealand orientation were half as likely to gamble than fathers identifying with a high New Zealand orientation and low Pacific orientation; however, fathers with both a low New Zealand and a low Pacific cultural orientation were three times more likely to gamble in the previous 12 months than fathers identifying with a high New Zealand orientation and low Pacific orientation. These findings were retained when a variety of socio-demographic variables were controlled for by multivariate analyses.

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[7] These results need to be treated with caution due to small sample sizes.

Non-cultural gender differences were also apparent. Fathers who were in the higher total net weekly household income brackets (>$500) were more likely to gamble than fathers in the lower income bracket (<$501), whilst mothers with post-school qualifications were less likely to gamble (0.7 times) than mothers with no formal qualifications.

In addition, gambling was significantly associated with smoking and alcohol consumption both for mothers and fathers. This finding is consistent with findings from the recent British Gambling Prevalence Survey (Wardle et al., 2007) which identified that smokers and higher level alcohol consumers were more likely to have gambled than non-smokers/drinkers. In the current study, mothers who drank alcohol were also more likely to have a weekly gambling expenditure in the upper quartile (≥$20) than mothers who did not drink, with increased frequency and amount of consumption associated with increased risk of the higher gambling expenditure. Similarly, increased frequency and amount of alcohol consumption by fathers was associated with increased likelihood of gambling in the past 12 months than non-gamblers. Fathers who drank alcohol at a harmful level (as assessed by the AUDIT test) were 6.4 times more likely to gamble during the previous 12 months than fathers who did not drink or did not drink to a harmful level, though unlike mothers, were not more likely to have expenditure in the upper quartile.

4.2 Problem gambling screens

The Problem Gambling Severity Index (PGSI) was shown to have very good internal consistency (reliability) for use both with mothers and fathers. The South Oaks Gambling Screen-Revised (SOGS-R) was also shown to have very good overall internal consistency (reliability) for use with fathers.

Using the PGSI, the majority of mothers and fathers were classified as current (past 12-month) non-problem gamblers (84% and 72% respectively), with 12% of mothers and fathers classified as low risk gamblers, three percent of mothers and 10% of fathers classified as moderate risk gamblers, and one percent and six percent respectively classified as problem gamblers. The 2002/03 New Zealand Health survey identified that 3.8% of Pacific peoples were classified as problem gamblers, although the results are not directly comparable since a non-standard problem gambling screen was used (Ministry of Health, 2006).

Using the SOGS-R, 90% of fathers were classified as current (past six-month) non-problem gamblers, five percent were classified as problem gamblers and five percent as probable pathological gamblers. In the 1999 national prevalence survey, two percent of Pacific peoples were identified as current (past six month) problem gamblers and two percent as probable pathological gamblers (Abbott & Volberg, 2000). However, the results are not directly comparable as the prevalence survey results were not split into male and female.

There was good agreement between the SOGS-R and PGSI with only one father identified as a problem gambler by the SOGS-R (using the dichotomised values) who was classified as a non-problem gambler using the PGSI[8].

Stevens and Young (2007) reported a gender and order effect for problem gambler classification in a general population survey conducted in the Northern Territory, Australia.

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[8] Note that the PGSI used a past 12-month time frame whilst the SOGS-R used a past six-month time frame, so the results are not directly comparable.

They noted that amongst males, when the SOGS questions were administered immediately after the PGSI questions, that higher numbers of problem gamblers were classified by SOGS than if the screen was administered first. In the current study, the SOGS-R questions were administered after the PGSI questions, so it is possible that a screen order effect may also be present; however, this was not empirically tested.

Results from the current study also indicated a good association between the lying and betting questions and the PGSI and SOGS-R. All mothers and fathers who stated that they had lied to hide their gambling fell within the at risk/problem gambler PGSI dichotomised classification. All mothers and 13 of 14 fathers who reported betting/spending more money than intended on gambling also fell within the at risk/problem gambler PGSI dichotomised classification, with one father (<1%) falling within the non-problem gambler classification (false positive). When the lying and betting question responses were correlated with SOGS-R classifications for fathers, marginally more false positives were noted with three percent of non-problem gamblers responding positively to the lying question and five percent of non-problem gamblers responding positively to the betting more than intended question. It should be noted at this stage that the questions around lying and betting more than intended were not the Lie-Bet two-item screen per se but were based on the Lie-Bet tool.

As the Lie-Bet tool was designed to identify gamblers with a severe level of problem gambling it is important to note that the statistical analyses correlating the lying and betting questions with the PGSI or SOGS-R were performed using dichotomised variables for the two problem gambling screens. Thus, a review of the categorical (non-dichotomised) data was also performed. This revealed a slight gender difference with a positive response to the lying and betting questions being more indicative of fathers being a problem gambler (PGSI) or probable pathological gambler (SOGS-R) than mothers. For fathers, 80% of PGSI problem gamblers and 88% of SOGS-R probable pathological gamblers reported lying to hide their gambling; for mothers only one-quarter (25%) of PGSI problem gamblers reported lying although 30% of moderate risk gamblers also reported lying. Ninety percent of fathers classified as problem gamblers (PGSI) and 88% of fathers classified as probable pathological gamblers (SOGS-R) reported betting/spending more money than intended; for mothers the figure was 50% with 60% of the moderate risk gamblers also reporting betting/spending more money than intended. When a positive response to either of the lying and betting/spending more than intended questions was analysed against PGSI classifications, the gender difference remained and the sensitivity of the correlation was increased. All (100%) of fathers and half (50%) of mothers classified as problem gamblers responded positively to either or both of the lying and betting questions.

Notwithstanding the slight gender difference, these results suggest that the PGSI and questions concerning lying and betting are valid in this Pacific cohort with both males and females, as well as the SOGS-R with males. The results also indicate that the nine-item PGSI is an acceptable replacement (at least amongst the Pacific males in this study) for the longer 22-item SOGS-R which has been used in previous national prevalence surveys.

4.3 Associations between PGSI and demographic variables

Tongan mothers were 2.4 times more likely to fall into PGSI classified at risk/problem gambler groups than Samoans. This ethnic difference was not noted amongst fathers. For fathers, those with a total net weekly household income of greater than $1,000 were less likely to be at risk/problem gamblers than fathers in the lowest income bracket ($500).

Interestingly, no statistically significant associations were noted between at risk/problem gambler status and smoking or alcohol consumption. However, as detailed previously in this discussion, a correlation was noted between these variables and gambling per se. Previous research has documented a correlation between these comorbid behaviours and problem gambling (for example see Abbott, 2001; Crockford & el-Guebaly, 1998; Grant et al., 2002; Griffiths et al., 2002; MacCallum & Blaszczynski, 2002; Ministry of Health, 2006; Potenza et al., 2002). This apparent discrepancy with previous research may be, in part, explained by the need for dichotomising the PGSI classifications into non-problem gambler and at risk/problem gambler.

4.4 Associations between PGSI and expenditure

A clear association was noted between higher (upper quartile) expenditure on gambling and being classified as a low risk/moderate risk/problem gambler. At risk/problem gambler classified mothers were three times more likely than non-problem gamblers to spend ≥$20 per week on gambling whilst fathers in the at risk/problem gambler category were six times more likely to spend ≥$60 per month on gambling than fathers classified as non-problem gamblers.

4.5 Associations between gambling, PGSI and health

A gender difference was noted for psychological distress (measured by the General Health Questionnaire) associated with gambling or at risk/problem gambling. There was no association amongst mothers. However, amongst fathers, those who gambled were 2.5 times more likely to exhibit psychological distress than fathers who did not gamble. In addition, fathers who were classified as at risk/problem gambler using the PGSI were twice as likely to report psychological distress as non-problem gamblers, though a level of statistical significance was not attained.

Anecdotally, through small Pacific qualitative studies, intimate partner violence is considered to be an issue that is related to gambling (Perese & Faleafa, 2000; Tu'itahi et al., 2004). The current study indicated that for mothers there was no association between gambling and being a victim or perpetrator of intimate partner violence (measured by the Conflict Tactics Scale). and in fact, when adjusted for a range of confounding variables, mothers in the PGSI dichotomised at risk/problem gambler group were significantly *less* likely to report perpetrating violence than non-gamblers. However, the opposite was true for fathers as those who gambled were significantly *more* likely to be perpetrators and victims of verbal aggression and physical violence than fathers who did not gamble, with the association remaining for verbal aggression when the data were adjusted for a range of confounding variables. Fathers who were categorised as at risk/problem gamblers by the PGSI were about three times more likely to report perpetration of physical violence than non-problem gamblers. Thus it appears that gambling and intimate partner violence (in particular verbal aggression) are associated in Pacific fathers, with at risk/problem gambling also being associated with physical violence. In an earlier phase of the PIF study (24-month data collection point) no statistically significant associations were noted between intimate partner violence and problem gambling (Schluter, Abbott & Bellringer, 2008). The current findings for mothers, therefore, reflect the previous findings, whilst a difference has been noted for fathers between the two data collection points. The discrepancy could be due to a change in behaviour over time or an artefact of the small numbers of problem gamblers within the study.

Gambling and problematic gambling behaviour amongst mothers and fathers in the PIF cohort did not appear to have a negative effect on child behaviour at the six-year data collection point.

4.6 Problems due to someone else's gambling

Four percent of mothers and ten percent of fathers reported that they had experienced problems because of someone else's gambling. However, at this stage it is not possible to comment further on this finding as the study protocol did not incorporate a question to determine who the 'someone else' was (e.g. partner) to allow cross-tabulations against problem gamblers within the cohort.

4.7 Conclusion

This study has significantly increased the knowledge around Pacific peoples' gambling since the nature of the general population cohort has allowed for analyses to be performed for different Pacific ethnicities and other cultural and demographic variables, which is not usually possible in general population studies due to small Pacific participant sample sizes.

Whilst the data in this report represent a cross-section in time, at the six-year data collection point for the cohort, the potential exists for gambling to continue to be a significant part of future data collection phases. This will allow for longitudinal analyses to explore the links between parental gambling and child development of gambling behaviours, as well as risk and protective factors for problem gambling amongst not only adults but also children as they progress through teenage years and into adulthood. It will also allow for exploration of changes over time in regard to gambling participation and problem gambling risk and protective factors.

Gambling participation was lower amongst the participants in the cohort than would be expected though a bimodal distribution of gambling was apparent, as was expected from previous national prevalence surveys. However, amongst those who gambled a high prevalence of problematic gambling was apparent. Substantial gender differences were apparent in gambling participation and preferences (excluding Lotto). Ethnicity appeared to be a key factor in mothers' gambling but not for fathers. Tongan mothers were less likely to gamble than Samoan mothers but those who gambled were 2.4 times more likely to be classified as at risk/problem gamblers, indicating that Tongan mothers are at higher risk for developing problem gambling. Cultural orientation appeared to be related to gambling (in some cases, less gambling) both for mothers and fathers, though different orientations were associated with gambling for the different genders. Fathers who were in the higher total net weekly household income brackets (>$500) were more likely to gamble than fathers in the lower income bracket (<$501), whilst mothers with post-school qualifications were less likely to gamble (0.70 times) than mothers with no formal qualifications.

Further gender differences were noted in terms of associations between gambling and health. For fathers both gambling and at risk/problem gambling were associated with psychological distress. Fathers who gambled were also more likely to be perpetrators as well as victims of verbal aggression than fathers who did not gamble, with at risk/problem gambling also being associated with physical violence. These findings were not noted amongst mothers whereby at risk/problem gamblers were significantly *less likely* to perpetrate violence than non-problem gamblers.

Not unexpectedly, smoking and alcohol consumption (particularly at higher/harmful levels) were associated with gambling (though not with at risk/problem gambling) both for mothers and fathers.

The problem gambling screens used (PGSI for mothers and fathers and SOGS-R for fathers only) showed very good internal consistency (reliability). There was good agreement between the PGSI and SOGS-R with 94% of fathers identified as problem gamblers by the SOGS-R also being classified as at risk/problem gamblers by the PGSI. In addition, questions related to lying about gambling and betting more than intended also associated well with the PGSI and SOGS-R within this Pacific cohort. The results suggest that the use of any of these problem gambling screens may be valid for use within a general Pacific population, though this would need to be further tested.

Four percent of mothers and ten percent of fathers reported that they had experienced problems because of someone else's gambling.

The findings detailed in this report indicate that different gender and ethnic differences exist amongst Pacific people who should, therefore, not be considered as a homogeneous group. This has implications for service provision by organisations providing services for Pacific people as well as social marketing campaigns around gambling and problem gambling.

5. LIMITATIONS OF THIS STUDY

Whilst there have been substantial benefits in adding a large number of gambling-related questions to the Pacific Islands Families longitudinal cohort study, such as the ability to relate gambling to a host of socio-demographic and health variables for relatively little cost in a large representative Pacific population group, there have been some limitations too. Due to the large respondent burden on cohort mothers who were answering questions relating to themselves, their cohort child, and family functioning in general, only gambling participation questions were asked as part of the main interview protocol. The remaining gambling questions formed a supplementary questionnaire which was asked of mothers who indicated that they had gambled on at least one mode in the previous 12 months. Ethically, the mothers had to be asked to give additional consent to participate in the supplementary questionnaire and at that stage some refused, reducing the potential response rate. Additionally, a lower than expected rate of gambling participation was noted amongst the cohort parents than was expected from previous general population research. This was likely a consequence of the population group studied, namely parents with relatively young children in the household, and means that results for gambling participation are not necessarily representative of the New Zealand Pacific population. However, as the largest New Zealand Pacific population resides in the Auckland area[9] (67%) the study results are likely to be representative of Pacific parents with at least one young child.

The low numbers of at risk gamblers and problem gamblers within the cohort meant that for statistical analyses, PGSI and SOGS-R classifications had to be dichotomised into two groups (non-problem gamblers versus low risk/moderate risk/problem gambler for PGSI, and non-problem gambler versus problem/probable pathological gambler for SOGS-R). This was not ideal in that direct associations between problem gamblers and socio-demographic variables/health outcomes could not be made. In addition, due to the extremely large number of variables captured as part of the PIF study and the budget constraints of the current study, the Principal Investigators of the current study had to choose which variables would be used in the statistical analyses. Thus, there are a large number of associations and analyses that have not been performed. Appendix 4 details the topic and question areas investigated with parents as part of the PIF study in Year 6.

Some gambling-related questions could have been worded more appropriately for the study, noted in hindsight and suggested for future studies. For example, the Lie-Bet screen was not used, instead questions based in the tool were utilised; and questions around expenditure were phrased on a weekly basis for mothers and monthly for fathers so direct comparisons between the two could not be made. Finally, the AUDIT screen for alcohol misuse/dependence was utilised with fathers but not with mothers due to respondent burden.

No help-seeking behaviour questions were included in the six-year data collection phase though this would be a useful avenue to explore in future data collection phases given that there is currently an under-representation of Pacific problem gamblers at specialist problem gambling treatment services.

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[9] Statistics New Zealand 2006 Census (www.stats.govt.nz/census/census-outputs/default.htm)

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Gambling activities
1. Could you please tell me which gambling activities you have taken part in over the last 12 months:
    a. Lotto (including Strike, Powerball and Big Wednesday)
    b. Keno (not in a casino)
    c. Instant Kiwi or other scratch ticket
    d. Housie (bingo) for money
    e. Horse or dog racing (excluding office sweepstakes)
    f. Sports betting at the TAB or with an overseas betting organisation
    g. Gaming machines or pokies at the casino
    h. Table games or any other games at the casino
    i. Gaming machines or pokies in a pub or club (not the casino)
    j. Internet-based gambling
    k. Other gambling activity. *Please specify:*
    l. None of the above

2. About how much would you <u>usually</u> spend each week on these gambling activities?
3. What form of gambling do you <u>most</u> prefer?
4. How often do you take part in this/these activities? (Less than monthly, monthly, weekly, daily or almost daily)

Problem Gambling Severity Index
The following questions are answered as: never, sometimes, most of the time or almost always[10].

5. Thinking about the past 12 months, how often have you bet more than you could really afford to lose?
6. Thinking about the past 12 months, how often have you needed to gamble with larger amounts of money to get the same feeling of excitement?
7. Thinking about the past 12 months, how often have you gone back another day to try to win back the money you lost?
8. Thinking about the past 12 months, how often have you borrowed money or sold anything to get money to gamble?
9. Thinking about the past 12 months, how often have you felt that you might have a problem with gambling?
10. Thinking about the past 12 months, how often have people criticised your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?
11. Thinking about the past 12 months, how often have you felt guilty about the way you gamble, or what happens when you gamble?
12. Thinking about the past 12 months, how often has your gambling caused you any health problems, including stress or anxiety?
13. Thinking about the past 12 months, how often has your gambling caused any financial problems for you or your household?

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[10] The corresponding scores are: Never = 0, Sometimes = 1, Most of the time = 2, Almost always = 3. Thus the maximum total score for the nine-item screen is 27. A total score of 0 = non-problem gambler, 1-2 = low risk gambler, 3-7 = moderate risk gambler, 8+ = problem gambler.

Questions around lying and betting
14. Thinking about the past 12 months, how often have you lied to family members or others to hide your gambling?
15. Thinking about the past 12 months, how often have you bet or spent more money than you wanted to on gambling?
16. Thinking about the past 12 months, how often have you wanted to stop betting money or gambling, but didn't think you could?

Questions around someone else's gambling:
17. Have you had problems because of someone else's gambling in the last 12 months? (Yes/No)

18. Can you say what kind of gambling was involved?
    a. Lotto (including Strike, Powerball and Big Wednesday)
    b. Keno (not in a casino)
    c. Instant Kiwi or other scratch ticket
    d. Housie (bingo) for money
    e. Horse or dog racing (excluding office sweepstakes)
    f. Sports betting at the TAB or with an overseas betting organisation
    g. Gaming machines or pokies at the casino
    h. Table games or any other games at the casino
    i. Gaming machines or pokies in a pub or club (not the casino)
    j. Internet-based gambling
    k. Other gambling activity. *Please specify:*
    l. Not sure/don't know

Fathers' gambling questions

Gambling activities, past 12 months
1. Could you please tell me which gambling activities you have taken part in over the last 12 months:
    - m. Lotto (including Strike, Powerball and Big Wednesday)
    - n. Keno (not in a casino)
    - o. Instant Kiwi or other scratch ticket
    - p. Housie (bingo) for money
    - q. Horse or dog racing (excluding office sweepstakes)
    - r. Sports betting at the TAB or with an overseas betting organisation
    - s. Gaming machines or pokies at the casino
    - t. Table games or any other games at the casino
    - u. Gaming machines or pokies in a pub or club (not the casino)
    - v. Internet-based gambling
    - w. Other gambling activity. *Please specify:*
    - x. None of the above

Problem Gambling Severity Index
The following questions are answered as: never, sometimes, most of the time or almost always[11].

2. Thinking about the past 12 months, how often have you bet more than you could really afford to lose?
3. Thinking about the past 12 months, how often have you needed to gamble with larger amounts of money to get the same feeling of excitement?
4. Thinking about the past 12 months, how often have you gone back another day to try to win back the money you lost?
5. Thinking about the past 12 months, how often have you borrowed money or sold anything to get money to gamble?
6. Thinking about the past 12 months, how often have you felt that you might have a problem with gambling?
7. Thinking about the past 12 months, how often have people criticised your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?
8. Thinking about the past 12 months, how often have you felt guilty about the way you gamble, or what happens when you gamble?
9. Thinking about the past 12 months, how often has your gambling caused you any health problems, including stress or anxiety?
10. Thinking about the past 12 months, how often has your gambling caused any financial problems for you or your household?

Questions around lying and betting
11. Thinking about the past 12 months, how often have you lied to family members or others to hide your gambling?
12. Thinking about the past 12 months, how often have you bet or spent more money than you wanted to on gambling?

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[11] The corresponding scores are: Never = 0, Sometimes = 1, Most of the time = 2, Almost always = 3. Thus the maximum total score for the nine-item screen is 27. A total score of 0 = non-problem gambler, 1-2 = low risk gambler, 3-7 = moderate risk gambler, 8+ = problem gambler.

13. Thinking about the past 12 months, how often have you wanted to stop betting money or gambling, but didn't think you could?

Gambling activities, past six months

14. Can you tell me which of the activities you have bet or spent money on in the past six months?
15. Can you give me an idea of the amount of money that you spend on the activity in a typical month? I am only looking for an approximate amount, rounded to the nearest $5 or so.
16. And can you tell me which of these activities you usually take part in once a week or more often?
17. Thinking about the sorts of activities which I have mentioned, please tell me which is the gambling activity that you <u>most</u> enjoy doing?
18. And can you tell me the reasons why you participate in <u>this</u> activity?

South Oaks Gambling Screen - Revised

19. When you participate in the gambling activities we have discussed, how often during the last six months did you go back another day to win money you lost? (never, some of the time, most of the time, every time)
20. During the last six months did you ever claim to be winning money from these activities when in fact you lost it? (never, half the time, most of the time)
21. During the last six months did you ever spend either more time or more money gambling than you intended? (Yes/No)
22. During the last six months have people criticised your gambling? (Yes/No)
23. During the last six months did you feel guilty about the way you gamble or about what happens when you gamble? (Yes/No)
24. During the last six months have you felt that you would like to stop gambling but didn't think that you could? (Yes/No)
25. During the last six months have you ever hidden betting slips, lottery tickets, gambling money or other signs of gambling from your spouse or partner, children or other important people in your life? (Yes/No)
26. During the last six months have you argued with people you live with over how you handle money? (Yes/No)
27. Have any of these arguments centred on your gambling (Yes/No)
28. During the last six months have you missed time from work, school or study due to gambling? (Yes/No)
29. During the last six months have you borrowed money from someone and not paid them back as a result of your gambling? (Yes/No)
30. Can you tell me which of the following, if any, you have used in the last six months to get money for gambling or to pay gambling debts? (All Yes/No)
    a. Borrowed from household money?
    b. Borrowed money from your spouse or partner?
    c. Borrowed from other relatives or in-laws
    d. Loans from banks, loan companies or other finance companies?
    e. Cash withdrawals on credit cards? (Does not include EFTPOS and other instant cash cards to access bank account)
    f. Loans from loan sharks?
    g. Cashed in shares, insurance policies or other securities?
    h. Sold personal or family property?
    i. Borrowed from your cheque account by writing cheques that bounced?
31. Do you feel that you have ever had a problem with gambling? (Yes/No) (Not SOGS-R)
32. Do you feel that you have had a problem with gambling in the past six months? (Yes/No)

Gambling participation

33. When you participate in the gaming activities that you most enjoy, do you usually do so: Alone / With your spouse or partner / With other family members / With friends or co-workers / With some other individual or group

34. When you participate in the gaming activities that you most enjoy, do you usually do so for: Less than one hour / 1 to 2 hours / 3 to 5 hours / 6 to 12 hours / More than 12 hours

35. What is the largest amount of money you have ever lost in one day of gambling? Less than $1 / $1 to $9 / $10 to $99 / $100 to $999 / $1,000 to $9,999 / $10,000 or more

Questions around someone else's gambling:

36. Have you had problems because of someone else's gambling in the last 12 months? (Yes/No)

37. Can you say what kind of gambling was involved?
    a. Lotto (including Strike, Powerball and Big Wednesday)
    b. Keno (not in a casino)
    c. Instant Kiwi or other scratch ticket
    d. Housie (bingo) for money
    e. Horse or dog racing (excluding office sweepstakes)
    f. Sports betting at the TAB or with an overseas betting organisation
    g. Gaming machines or pokies at the casino
    h. Table games or any other games at the casino
    i. Gaming machines or pokies in a pub or club (not the casino)
    j. Internet-based gambling
    k. Other gambling activity. *Please specify:*
    l. Not sure/don't know

APPENDIX 3:
Gambling activity participation in past 12 months

Participation of number and percentage of total cohort

Activity	Mothers (N=1,001)				Fathers (N=591)			
	Y	(%)	N	(%)	Y	(%)	N	(%)
Lotto	324	(32.4)	677	(67.6)	154	(26.1)	437	(73.9)
Keno	26	(2.6)	975	(97.4)	16	(2.7)	575	(97.3)
Instant Kiwi	41	(4.1)	960	(95.9)	24	(4.1)	567	(95.9)
Housie	43	(4.3)	958	(95.7)	5	(0.8)	586	(99.2)
Horse/dog racing	0	(0)	1,001	(100.0)	17	(2.9)	574	(97.1)
Sports betting	1	(0.1)	1,000	(99.9)	13	(2.2)	578	(97.8)
Casino EGMs	20	(2.0)	981	(98.0)	35	(5.9)	556	(94.1)
Casino table games	1	(0.1)	1,000	(99.9)	10	(1.7)	581	(98.3)
Non-casino EGMs	12	(1.2)	989	(98.8)	27	(4.6)	564	(95.4)
Internet gambling	0	(0)	1,001	(100.0)	1	(0.2)	590	(99.8)
Other gambling	9	(0.9)	992	(99.1)	0	(0)	591	(100.0)

Participation of number and percentage of those who gambled

Activity	Mothers ((n=363)				Fathers (n=176)			
	Y	(%)	N	(%)	Y	(%)	N	(%)
Lotto	324	(89.3)	39	(10.7)	154	(87.5)	22	(12.5)
Keno	26	(7.2)	337	(92.8)	16	(9.1)	160	(90.9)
Instant Kiwi	41	(11.3)	322	(88.7)	24	(13.6)	152	(86.4)
Housie	43	(11.8)	320	(88.2)	5	(2.8)	171	(97.2)
Horse/dog racing	0	(0)	363	(100.0)	17	(9.7)	159	(90.3)
Sports betting	1	(0.3)	362	(99.7)	13	(7.4)	163	(92.6)
Casino EGMs	20	(5.5)	343	(94.5)	35	(19.9)	141	(80.1)
Casino table games	1	(0.3)	362	(99.7)	10	(5.7)	166	(94.3)
Non-casino EGMs	12	(3.3)	351	(96.7)	27	(15.3)	149	(84.7)
Internet gambling	0	(0)	366	(100.0)	1	(0.6)	175	(99.4)
Other gambling	9	(2.5)	354	(97.5)	0	(0)	176	(100.0)

Topic and question areas for parents, PIF study Year 6

Dimension	Question description	Mothers	Fathers
Socio-demographic, cultural and environmental factors			
Parental demographic profile	Gender, age, marital status, ethnicity, country of origin, years lived in New Zealand, religion, church involvement, education, present employment, income, economic problems	✓	✓
Household composition	Family composition and relationships	✓	
Housing	Type, tenure, facilities, appliances, heating, quality, cost, satisfaction, privacy, pests and perceived crowding. Modified Housing Issues Scale (Fuller et al., 1993),	✓	
Neighbourhood problems	Modified Neighbourhood Problems Scale (Steptoe & Feldman, 2001)	✓	
Parental cultural orientation	Modified General Ethnicity Questionnaire (Tsai, Ying & Lee, 2000)	✓	✓
Child development			
Child behaviour	Child Behaviour Checklist (Achenbach & Rescorla, 2001), Strengths and Difficulties Questionnaire (Goodman, 1997)	✓	✓
Cognitive, motor, psychosocial and language development	Developmental milestones (American Academy of Paediatrics)	✓	
Childhood activities and experiences	Child friendships (modified from NLSY Study)	✓	
Family and household dynamics			
Sharing/support	Support from family members/others, sharing in care of child	✓	
Partner relationships	The Conflict Tactics Scale (Straus, 1990)	✓	✓
Fathering roles and involvement	Inventory of Father Involvement (Hawkins et al., 2002)		✓
Parental involvement with school	PIF-developed	✓	✓
Childcare arrangements	After school care (modified from NICHD Study)	✓	
Discipline and nurturing	The Parenting Practices Questionnaire (Robinson, 1995),	✓	✓
	Forms of discipline used (modified from LAFANS Study)	✓	✓
Care-giving environment	Modified HOME-MC (Caldwell & Bradley, 2003)	✓	
Feeding	Child and family nutrition, child feeding methods, problems and advice	✓	
Child activity	Sleeping, watching television, playing games, physical activity	✓	
Lifestyle factors			
Alcohol consumption	Amount and frequency	✓	
	Alcohol Use Disorders Identification Test (Saunders et al., 1993)		✓
Smoking	Number of cigarettes smoked daily, number of other household smokers	✓	✓
Gambling	Problem Gambling Severity Index (Ferris & Wynne, 2001)	✓	✓
	South Oaks Gambling Screen - Revised (Abbott & Volberg, 1991)		✓
	Participation and activity, problems due to someone else's gambling	✓	✓
Physical activities	Physical Activity and Nutrition in New Zealand (SPARC, 2003)	✓	✓
Parent and child health issues			
Parental health	General Health Questionnaire - 12 (Goldberg & Williams, 1988)	✓	✓
	Rosenberg Self-Esteem Scale (Rosenberg, 1965)	✓	✓
Life events	Modified Social Readjustment Rating Scale (Holmes & Rahe, 1967), life events in last 12 months	✓	✓
Child immunisation	Standard immunisations received, reasons for non-immunisation, parental attitudes to immunisation	✓	
Child illness episodes	Child health visits, frequency and reason. Treatments given and satisfaction with treatments, asthma symptoms	✓	
Oral health	Frequency of child cleaning teeth, enrolment with school dental service, dental treatment	✓	
Significant injuries	Requiring treatment by doctor/nurse	✓	