



PACIFIC ISLANDS FAMILIES STUDY 2009: MOTHER AND CHILD GAMBLING

Provider Number: 467589

Agreement Number: 327774 / 00

FINAL REPORT

Re-issued 29 May 2012

Prepared for: Ministry of Health PO Box 5013 Wellington

Authors: Dr Maria Bellringer Steve Taylor Zoe Poon Professor Max Abbott Professor Janis Paterson

ACKNOWLEDGEMENTS

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

The authors are highly appreciative of, and thank, the whole Pacific Islands Families Study team¹ for managing the study and its associated processes including data collection and cleaning. Grateful acknowledgement is also made of all the families who are participating in this longitudinal study. The authors also thank the study Advisory Board members for their invaluable input, the survey interviewers, and Bridget Fa'amatuainu for sourcing some of the literature.

¹ The team is part of the Centre for Pacific Health and Development Research, National Institute for Public Health and Mental Health Research, Auckland University of Technology.

Pacific Islands Families Study 2009. Provider No: 467589, Agreement No: 327774/00 Gambling and Addictions Research Centre, Auckland University of Technology Final Report, re-issued 29 May 2012

CONTENTS

EXECUTIVE SUMMARY	
1. BACKGROUND	
2. RESEARCH METHODOLOGY	14
 2.1 Ethics approval	
2.3.1 Objectives 2.3.2 Design	
2.3.3 Recruitment	
2.3.4 Function 2.3.5 Data analysis	
3. RESULTS	
3.1 Mothers: Descriptive statistics	
3.1.1 Demographic data	
3.1.3 Gambling frequency	
3.1.4 Gambling expenditure	
3.1.6 Problem Gambling Severity Index scores	
3.1.7 Lying and betting	
3.2.1 Demographic factors	
3.2.2 Gambling expenditure	
3.2.4 Lying and betting associated with Problem Gambling Severity Index	
3.2.5 Participating in continuous forms of gambling	
3.2.0 Participating in non-continuous forms of gambling (Lotto and Keno on 3.2.7 Analyses with non-significant associations	(1y) 35 37
3.3 Children: Descriptive statistics	
3.3.1 Demographic data 3.3.2 Gambling participation	
3.4 Children: Association statistics	
3.4.1 Demographic factors 3.4.2 Behaviour and cognitive ability	
3.4.3 Parental monitoring	
3.4.4 Analyses with non-significant associations	
4. DISCUSSION	
4.1 Gambing activity 4.2 Gambling associations	
4.3 Problem gambling screens	
4.4 Problems due to someone else's gambling4.5 Conclusion	
5. LIMITATIONS OF THIS STUDY	55
6. REFERENCES	56
APPENDIX 1: Topic and question areas for mothers and children, PIF study Year 9	60
APPENDIX 2: Mothers' gambling questions	61

APPENDIX 3: Children's gambling questions	64
APPENDIX 4: Mothers gambling activity participation in past 12 months (Year 9)	65

LIST OF TABLES

Table 1: Mothers - Socio-demographic characteristics	20
Table 2: Mothers - Gambling participation in Years 6 and 9	21
Table 3: Mothers - Relationship of other person in Year 9	24
Table 4: Mothers - Effect of another person's gambling in Year 9	25
Table 5: Mothers - Gambling classification in Years 6 and 9	26
Table 6: Mothers - Percentages of lying and betting behaviour	27
Table 7: Mothers - Numbers, percentages and univariate odds ratios for gambling in Year	:929
Table 8: Mothers - Adjusted odds ratios for gambling	30
Table 9: Mothers - Numbers, percentages and univariate odds ratios for spending >\$40/m	onth
in Year 9	31
Table 10: Mothers - Adjusted odds ratios for spending ≥\$40/month in Year 9	31
Table 11: Mothers - Numbers, percentages and univariate odds ratios of being at risk/	
problem gamblers in Year 9	32
Table 12: Mothers - Adjusted odds ratios of being at risk/problem gamblers in Year 9	32
Table 13: Mothers - Numbers, percentages and univariate odds ratios for continuous gam	bling
in Year 9	34
Table 14: Mothers - Adjusted odds ratios for continuous gambling in Year 9	35
Table 15: Mothers - Numbers, percentages and univariate odds ratios for non-continuous	
gambling in Year 9	36
Table 16: Mothers - Adjusted odds ratios for non-continuous gambling in Year 9	37
Table 17: Children - Socio-demographic characteristics	38
Table 18: Children - Numbers, percentages and univariate odds ratios for gambling	41
Table 19: Children - Univariate odds ratios of gambling and behaviour and cognitive abil	ity42
Table 20: Children - Adjusted odds ratios of gambling and behaviour and cognitive ability	y.43
Table 21: Children - Univariate odds ratios of gambling and parental monitoring	43
Table 22: Children - Adjusted odds ratios of gambling and parental monitoring	43

LIST OF FIGURES

Figure 1: Mothers - Gambling per activity, percentage of all mothers	21
Figure 2: Mothers - Gambling per activity, percentage of mothers who gambled	22
Figure 3: Mothers - Median usual monthly expenditure per gambling activity in Year 9	23
Figure 4: Mothers - Number affected per mode of gambling	24
Figure 5: Mothers - Distribution of PGSI scores in Years 6 and 9	25
Figure 6: Children - Gambling participation	39
Figure 7: Children - With whom they bet money	39
Figure 8: Children - With whom they played Housie	40
Figure 9: Children - With whom they played Housie for money	40
Figure 10: Children - With whom they played Housie not for money	40

Pacific Islands Families Study 2009. Provider No: 467589, Agreement No: 327774/00 Gambling and Addictions Research Centre, Auckland University of Technology Final Report, re-issued 29 May 2012

EXECUTIVE SUMMARY

Background

In 2006, Pacific peoples comprised 6.9% of the New Zealand population with a projected increase to 9.6% by 2026. Pacific peoples are thus a significant minority group which should be considered in terms of health, welfare, social and economic issues. Since 1991, national cross-sectional surveys have shown that Pacific peoples are at significantly higher risk for developing problem gambling than the general population. Limited research has also shown that heterogeneous differences exist between the Pacific ethnicities although sample sizes are often insufficient to allow for analyses by ethnicity.

The Pacific Islands Families (PIF) study is a longitudinal study that is following a cohort of Pacific children who were born in the year 2000. This prospective study aims to determine the pathways which lead to optimal health, development and social outcomes for Pacific children and their families. The PIF study offers a valuable and unique opportunity to study gambling and problem gambling within a Pacific family and child development context, with sample sizes large enough to allow for sub-analyses of the major Pacific ethnic groups. The longitudinal aspect of the study also allows the potential to identify risk and protective factors in the development of problem gambling.

PIF 2006

When the PIF study children were six years old (Year 6), the Ministry of Health funded a substantial gambling component, with questions relating to gambling and problem gambling asked of mothers and fathers. The full study results are reported elsewhere (Bellringer, Abbott, Williams & Gao, 2008); however, in brief, the findings indicated that gender and ethnic differences existed amongst Pacific people. The key findings were:

A bimodal distribution of gambling participation was apparent, i.e. most participants did not gamble but those who did gamble generally spent more on gambling. 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 had lower odds for gambling than Samoan mothers but those who gambled had 2.4 times greater odds to be classified as at risk/problem gamblers, indicating that Tongan mothers were 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 had lower odds for gambling (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 had greater odds 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 had *lower odds* to perpetrate violence than non-problem gamblers.

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.

Four percent of mothers and ten percent of fathers reported that they had experienced problems because of someone else's gambling. (Bellringer et al., 2008)

PIF 2009

In May 2009, the Gambling and Addictions Research Centre at Auckland University of Technology was again commissioned by the Ministry of Health to conduct significant further gambling-related data collection and analyses, this time at the Year 9 data collection phase. Gambling-related data were collected from mothers and the children, who were nine years of age. No data were collected from fathers at this time point. The two main aims of the Year 9 analyses were:

- Assess for possible predictors (risk factors) and protective factors for gambling
- Investigate associations between child gambling behaviours and social, familial, environmental and individual factors

Methodology

A range of gambling-related questions was incorporated into the interview questionnaire protocols for mothers and children at the Year 9 data collection phase.

For mothers, the questions related to gambling participation and expenditure, and to having problems because of someone else's gambling; the Problem Gambling Severity Index (PGSI) was also included. Where possible, the questions were in the same format as asked at the Year 6 data collection phase to allow for comparative analyses. For children, the questions related to gambling participation, whether or not this was for money, and with whom the gambling took place.

A range of other measures was assessed in the mothers and children. For mothers, the variables measured were not necessarily the same as at the Year 6 data collection phase. Some psychometric measures were modified to enhance cultural appropriateness and reduce respondent burden.

Cohort mothers were invited to participate in the PIF study Year 9 assessment and were also asked to provide consent for their child's participation. The majority of participants were visited in their homes by the interviewers to complete the structured assessments. The remainder completed the questionnaires via telephone or postal methods.

Results

Mothers' gambling activity

The total percentage of mothers participating in gambling activities in the past year increased from 36% in Year 6 to 50% in Year 9. Thus, there was an increase in gambling prevalence (36% to 50%). A slight increase in incidence was noted too (199 non-gamblers in Year 6 were gamblers in Year 9, 90 gamblers in Year 6 were non-gamblers in Year 9).

Mothers who had gambled in the past 12 months at the Year 6 time point had 4.4 times greater odds for gambling in the past 12 months at the Year 9 time point. Additionally, *any* gambling in Year 6 was more likely to lead to riskier (continuous forms) gambling in Year 9,

and mothers who participated in riskier gambling in Year 6 were less likely to revert to low risk (non-continuous forms) gambling in Year 9.

Mothers who gambled in Year 6 also had higher odds for gambling on continuous forms (all forms except Lotto and Keno) in Year 9. Similarly, gambling on the riskier (continuous) forms for problem gambling development in Year 6 led to lower odds of participating only on low risk (non-continuous forms of gambling) three years later.

Of the mothers who had gambled during the previous 12 months, Lotto was the form of gambling most participated at both time points (89% Year 6, 92% Year 9) with much lower levels of participation in other forms of gambling (15% or less).

In Year 9, frequency of gambling (of the mothers who had gambled during the previous 12 months) was more likely to be weekly for Lotto, Instant Kiwi and Housie/bingo, and monthly or less than monthly for casino and pub electronic gaming machines. Keno was the only form of gambling where frequency of play was reported to be daily or almost daily by some respondents (3.7%) but with a majority reporting weekly play.

In Year 9, of the mothers who had gambled during the previous 12 months, median expenditure on gambling was \$20/month. Median monthly expenditure varied for different forms of gambling. The highest expenditures were on gambling forms participated in by a minority of mothers who had gambled: \$40/month for casino electronic gaming machine gambling participated by nine percent and \$30/month for Housie/bingo participated by 14%. Conversely, a lower median monthly expenditure of \$15 was reported for Lotto participated in by 92% of mothers who had gambled.

Children's gambling activity

Almost all children (96%) reported having played card games with family or friends and 60% reported having participated in Housie/bingo. The majority had not played for money (77%). When playing Housie/bingo for money, a greater percentage of boys and girls (over half) played more with family than when playing Housie/bingo not for money (one-third or less). Conversely, a substantially lower percentage played with friends when playing for money (19% boys, 7% girls) than when not playing for money (31% boys, 42% girls).

Seventeen percent of children had received scratch cards as a gift and seven percent reported buying Lotto/Big Wednesday/Keno tickets.

Twenty-seven percent of respondents reported having bet money with friends or family with just over half of those betting for money only with family (54.5%), one-fifth (20%) only with friends and one-quarter (25%) with both family and friends.

Boys were significantly more likely to play for money than girls, and girls were significantly more likely to prefer Housie/bingo than boys.

Mothers' gambling associations

Mothers whose financial situation had worsened (total household income decreased) from Year 6 to Year 9 had twice as great odds for gambling in Year 9 as mothers whose financial situation had remained stable over that period.

A change in marital status from partnered to separated from Year 6 to Year 9 was associated with statistically significant lower odds for gambling, with separated mothers having less than half the odds for gambling as mothers whose marital status had stayed the same. It was not possible to determine whether mothers who separated from partners who were gamblers were less likely to gamble.

A mild level of socio-economic deprivation was associated with gambling on continuous forms in Year 9.

Gambling was significantly associated with increased smoking and increased frequency of alcohol consumption from Year 6 to Year 9 compared with mothers whose smoking or alcohol consumption had remained stable.

Experiencing at least one significant life event in the previous 12 months was strongly associated with gambling expenditure in the upper quartile (\geq \$40/month).

Children's gambling associations

Being involved in a gang was statistically significantly associated with higher odds of gambling participation. Other negative behaviours such as bullying, delinquency and substance misuse were not associated with gambling.

Increase in similarities score (cognitive ability measured with Weschler Intelligence Score for Children) was associated with slightly lower odds of participating in gambling.

Lower parental monitoring was associated with increased odds of children's gambling.

Problem Gambling Severity Index

The majority of mothers in Year 6 and Year 9 who had gambled in the past year were classified as current (past 12-month) non-problem gamblers (84%, n=250 and 90%, n=367 respectively), with 12% (n=35)/5% (n=22) classified as low risk gamblers, three percent in both years classified as moderate risk gamblers (n=10 Year 6, n=13 Year 9), and one percent in both years classified as problem gamblers (n=4 Year 6, n=5 Year 9).

Of the individual mothers who were assessed in both Year 6 and Year 9 and who answered all PGSI questions (whether or not they gambled), 432 (61%) maintained the same gambling classification across the three years. One hundred and seventy-three mothers who had not gambled in the past 12-months in Year 6 were gamblers in Year 9 whilst 75 past-year gamblers in Year 6 were non-gamblers in Year 9.

Seventy-nine percent (n=120) of mothers who had gambled in both Year 6 and Year 9 maintained the same PGSI risk classification across both time points. Almost all were in the non-problem gambler category, with one mother remaining a low risk gambler and another mother remaining a moderate risk gambler at both time points. The remaining mothers changed PGSI classification. Seven percent (n=10) became low risk/moderate risk/problem gamblers from being prior non-problem gamblers, and 14% changed to a lower classification (low risk to non-problem gambler n=14, moderate risk to non-problem/low risk n=4, problem gambler to non-problem gambler n=3). Additionally, 19 non-gamblers in Year 6 were classified as gamblers with a level of risk in Year 9 (nine each classified at low risk and moderate risk, and one problem gambler) and 14 at-risk gamblers in Year 6 (11 low risk, two moderate risk and one problem gambler) were non-gamblers in Year 9. These findings indicate that problematic gambling exists on a continuum with some people moving into and out of problem gambling over time. All movement along the continuum for mothers who had been classified as low risk/moderate risk/problem gambler in Year 6 was towards reduced risk or problems in Year 9. As sample sizes were small, this finding must be treated with caution.

		Year 9 (N)				
		Non- gamblerNon- problemLow risk gamblerModerate risk gamblerProblem gambler				
	Non-gambler	312	154	9	9	1
(Z	Non-problem	61	118	6	2	2
	gambler					
r 6	Low risk gambler	11	14	1	0	0
∕ea	Moderate risk	2	3	1	1	0
	gambler					
	Problem gambler	1	3	0	0	0

A statistically significant association was noted between at risk/problem gambler classification and smoking (2.74 times greater odds).

Problems due to someone else's gambling

A very small minority of mothers reported having problems due to someone else's gambling in Year 9 (2.6%, n=25). This was less than in Year 6 (4.1%, n=41). The majority of the relationships were with close, immediate family members (spouse/partner, sibling or parent). The negative impacts included worrying about the other person's gambling (n=23) and financial impacts, with 14 of the affected mothers reporting that the effect of the other person's gambling was that they were paying for it financially. Six of the mothers reported being concerned about their safety as a consequence of the other person's gambling.

Conclusion

This study has added a second cross-sectional time point to the longitudinal Pacific Islands Families Study (Year 9 versus Year 6 previously reported) which has built on knowledge of mothers' gambling and allowed for some population level longitudinal analyses to be performed over a three-year time period from Year 6 to Year 9. Importantly, it has also allowed for gambling in Pacific children at nine years of age to be examined within a familial context. This is the first research of that nature and sets a baseline from which to explore the links between parental gambling and child development of gambling behaviours, as well as risk and protective factors for problem gambling amongst the children as they progress through adolescence and into adulthood. In conclusion, this study has identified the following key trends and findings. However, longer term implications of these findings cannot be concluded at this stage, in many cases because the samples sizes are very small, particularly in relation to at risk/ problem gambling or to gambling on forms other than Lotto.

Participation - mothers

Frequency of gambling in Year 9 (not measured in Year 6) for those mothers who reported gambling in the past 12 months was likely to be *weekly for lottery products* (Lotto, Instant Kiwi), Keno and Housie/bingo, and *monthly or less for electronic gaming machines*. A small minority (3.7%) of the mothers who had gambled in Year 9 reported playing Keno *daily*.

Participation - children

Almost all the children reported participating in either card games or Housie/bingo, though the majority did not play for money (77%). Boys were more likely to play for money than girls who were more likely to prefer Housie/bingo than boys. When playing Housie/bingo for money, a greater percentage of boys and girls played more with family than when playing Housie/bingo not for money. Conversely, a substantially lower percentage played with friends when playing for money than when not playing for money. Almost one-fifth (17%) of children had received scratch cards as a gift and seven percent reported buying Lotto/Big Wednesday/Keno tickets.

Trends - mothers

There was an *increase in gambling prevalence and incidence* amongst mothers from Year 6 to Year 9, although on an individual level there was some movement into and out of gambling/at risk/problem gambling.

Changes in non-gambling and gambling status, and PGSI risk levels, of individual mothers from Year 6 to Year 9 occurred in both directions indicating that *problematic gambling exists on a continuum* with some people moving into and out of problem gambling over time. All movement along the continuum for mothers who had been classified as low risk/moderate risk/problem gambler in Year 6 was *towards reduced risk or problems* in Year 9. As sample sizes were small, this finding must be treated with caution.

Forms of gambling participation have remained similar across both time points with Lotto being the most popular, and other forms at a substantially lower level.

Expenditure patterns in Year 9 indicated *support for a bimodal distribution of gambling*, as had been shown previously in Year 6. The bimodal distribution was indicated by a positive skew to data where there was a relatively high median expenditure correlated with low participation forms of gambling, and vice versa.

Fewer mothers reported having *problems with someone else's gambling* in Year 9 (n=25) compared with Year 6 (n=41). The majority of relationships were with close, immediate family members (e.g. spouse/partner, sibling or parent). Key negative impacts included worrying about the other person's gambling, financial concerns and safety concerns.

Trends - children

No trends for children were identifiable as the current study was the first time gamblingrelated data have been collected. Trends may be identifiable at future data collection phases.

Potential risk factors - mothers

Gambling in Year 6 was associated with higher odds for gambling in Year 9 and could indicate that participation in gambling is a risk factor for continued gambling participation. Furthermore, it is likely that any gambling is a risk factor for subsequent gambling on continuous forms, which are known to have a higher risk for problem gambling development.

Worsening of financial situation (total household income decreased) from Year 6 to Year 9 was associated with gambling in Year 9. However, the causal relationship is unknown.

A mild level of socio-economic deprivation was associated with gambling on continuous forms in Year 9. The causal relationship is unknown.

Being a *smoker* was associated with gambling at both time points but again, the causal relationship is not known.

Experiencing at least one significant life event in the previous 12 months was strongly associated with gambling expenditure in the upper quartile (\geq \$40/month); however, this finding needs to be treated with caution due to small sample size of mothers experiencing no life events and with upper quartile gambling expenditure.

Potential risk factors - children

Being involved in a gang was associated with higher odds of gambling participation; however, the causal relationship is not known.

Lower parental monitoring was associated with higher odds of children's gambling participation. Other research has indicated that children from families with a low level of parental monitoring tend to have a higher frequency of gambling.

Potential protective factors - mothers

Change in marital status from partnered to separated from Year 6 to Year 9 was associated with lower odds for gambling. However, the causal relationship for this finding is unknown.

Potential protective factors - children

There was an indication that *increased cognitive ability* (similarities test) was associated with slightly lower odds of participating in gambling.

There was no indication of any relationship between gambling and other health issues for mothers or children.

1. BACKGROUND

Pacific peoples in New Zealand

At the 2006 Census, Pacific peoples comprised 6.9% of the New Zealand population with the breakdown of the ethnic groups being Samoan (49%), Cook Island (22%), Tongan (19%), Niuean (8%), Fijian (4%), Tokelauan (3%) and Tuvaluan (1%) (Statistics New Zealand, 2007). It has been projected that the Pacific population will increase to 9.6% of the New Zealand population by 2026 (Statistics New Zealand, 2010). Whilst a small percentage of the overall population, Pacific peoples comprise a significant minority and are, therefore, an important group to consider in terms of the health, welfare, social and economic issues which affect the country as a whole. Since 1991, national cross-sectional surveys have shown that Pacific peoples are at significantly higher risk for developing problem gambling than the general population.

As with any other ethnic group, Pacific populations share some commonalities, while each of the ethnic groups has its own cultural values, beliefs, traditions, languages and history (Samu & Suaalii-Sauni, 2009; Tukuitonga & Finau, 1997). Unfortunately, the majority of national studies focus on differences between Caucasians and Maori versus non-Caucasians and non-Maori. Pacific peoples are generally perceived as one homogeneous ethnic group rather than individual ethnic groups. This is usually due to small sample sizes precluding analyses of the individual Pacific ethnic populations. However, as detailed below, the Pacific Islands Families (PIF) Year 6 study indicated that ethnic specific differences exist amongst the different Pacific populations in relation to gambling. Therefore, this indicates the importance of studies such as the PIF, where Pacific ethnic-specific analyses are possible. A further advantage of the PIF study is its prospective nature allowing for trends and changes over time to be evaluated.

Pacific Islands Families study

The Pacific Islands Families 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 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 PIF study is principally funded by the Foundation for Research, Science and Technology and focuses on the key developmental stages of childhood together with the influence of the socio-cultural context and family environment on Pacific children.

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 phases have been at six weeks, one, two, four, six and nine years after the birth of the child. Interviews with mothers have taken place at all data collection phases. Interviews with fathers occurred at the one-, two- and six-year data collection phases.

Interviews and assessments of children occurred at the six- and nine-year data collection phases.

Routine data collected at the nine-year phase 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, and parental health (Appendix 1).

Year 6 results

When the PIF study children were six years old, the Ministry of Health funded a substantial gambling component, with questions relating to gambling and problem gambling asked of mothers and fathers. The full study results are reported elsewhere (Bellringer et al., 2008); however, in brief, the findings indicated that gender and ethnic differences exist amongst Pacific people. The key findings were:

Gambling participation was lower amongst the participants in the cohort than would be expected though a bimodal distribution of gambling was apparent², 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 had lower odds for gambling than Samoan mothers but those who gambled had 2.4 times greater odds 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) had greater odds for gambling than fathers in the lower income bracket (<\$501), whilst mothers with post-school qualifications had lower odds for gambling (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 also had greater odds 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 had significantly *lower odds* to perpetrate violence than non-problem gamblers.

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.

Four percent of mothers and ten percent of fathers reported that they had experienced problems because of someone else's gambling. (Bellringer et al., 2008)

Year 9

In May 2009, the Gambling and Addictions Research Centre at Auckland University of Technology was again commissioned by the Ministry of Health to conduct significant further gambling-related data collection and analyses, this time at the Year 9 data collection phase.

 $^{^{2}}$ A bimodal distribution of gambling exists where a small percentage of the population group gambles, but those who do gamble are likely to have a higher than expected expenditure.

Pacific Islands Families Study 2009. Provider No: 467589, Agreement No: 327774/00 Gambling and Addictions Research Centre, Auckland University of Technology Final Report, re-issued 29 May 2012

Gambling-related data were collected from mothers and the children, who were nine-years of age. Fathers were not interviewed in Year 9 and thus no data were collected from them.

The two main aims of the Year 9 analyses³ were:

- Assess for possible predictors (risk factors) and protective factors for gambling
- Investigate associations between child gambling behaviours and social, familial, environmental and individual factors

³ The analyses for this report were conducted concurrently with other PIF analyses for a separate research project funded by the Ministry of Health (Exploration of the impact of gambling and problem gambling on Pacific families and communities in New Zealand). In order not to duplicate effort and data, different results have been presented and discussed in the two reports. Whilst each report is complete in itself, further understanding of Pacific gambling and its associations with other factors can be obtained by reading the other report (currently in preparation).

Pacific Islands Families Study 2009. Provider No: 467589, Agreement No: 327774/00 Gambling and Addictions Research Centre, Auckland University of Technology Final Report, re-issued 29 May 2012

2. RESEARCH METHODOLOGY

2.1 Ethics approval

Ethical approval for the full nine-year phase of the PIF study was granted by the Northern Y 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 nine 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 nine years of the PIF study. In this regard, one of the study's two 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 for each data collection phase of the study are usually 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 children, when the latter were nine years of age. Fathers were not interviewed at this data collection phase. The two main aims were:

- Assess for possible predictors (risk factors) and protective factors for gambling
- Investigate associations between child gambling behaviours and social, familial, environmental and individual factors

Additionally, it was anticipated the analyses would:

- Identify any trends in participating in gambling by Pacific mothers
- Assess the incidence of problem gambling among Pacific mothers
- Assess gambling by Pacific children
- Assess any relationship between gambling and other health issues

- Assess the relationship between gambling and quality of standard of life for children (i.e. nutrition) and the mother
- Assess any relationship between gambling status and economic standard of life (i.e. access to transport or telephone)
- Compare against key findings from the PIF 2006 report (i.e. children's behaviour, interpersonal violence)

2.3.2 Design

A range of gambling-related questions was incorporated into the interview questionnaire protocol for mothers, and five gambling participation questions comprised part of the child interview questionnaire protocol, at the nine-year data collection phase. The questions are detailed in Appendix 2 (mothers) and Appendix 3 (children).

Mothers' gambling questions related to participation and expenditure, two problem gambling screens (Problem Gambling Severity Index [PGSI] and Lie-Bet) and questions relating to having problems because of someone else's gambling. Children's gambling questions related to gambling participation, whether or not this was for money, and with whom the gambling took place.

The gambling participation questions for mothers were generally (where possible) the same as those asked at previous data collection points in the PIF study. This enabled 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 is 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.

The Weschler Intelligence Scale for Children (Fourth edition) (WISC-IV) was used to measure cognitive abilities of children in terms of full scale IQ and verbal comprehension, perceptual reasoning, working memory, and processing speed sub-scales (Weschler, 2003).

A range of other measures was assessed in the mothers and children. For mothers, the topics measured were not necessarily the same as at the six-year data collection phase. Some psychometric measures were modified to enhance cultural appropriateness and reduce respondent burden.

2.3.3 Recruitment

PIF cohort families were invited to participate in the nine-year assessment, with the major exceptions being those who are untraceable, 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 did not participate in some earlier assessments to still be eligible for subsequent assessments should they wish. In keeping with previous procedures, the majority of participants in the PIF study were visited in their homes to complete the structured interviews. The remaining participants were interviewed by telephone or they self-completed the questionnaires and returned them to the research team by post.

2.3.4 Participation

Data collection for primary caregivers⁴ (reported as mothers) commenced on 15 April 2009 and completed on 6 September 2010. Gambling data were collected from 957 primary caregivers (1,001 in Year 6⁵), of whom 870 (91%) were the birth mother of the cohort child and 754 (79%) also completed questionnaires at the six-year phase.

		Year 9				
		Gambling data collected	Not interviewed [#]	Total		
6	Gambling data collected	754	247	1,001		
ear	Not interviewed [#]	203				
Y	Total	957				

[#] Includes a different primary caregiver being interviewed between the years, the primary caregiver declining to answer the gambling questions or the primary caregiver not being asked the gambling questions

Data collection for the cohort children commenced on 11 May 2009 and completed on 27 October 2010. A total of 891 completed child assessments was received by the research team. This included 17 pairs of twins, for which one set of responses from each pair was excluded due to expected correlations in responses. Therefore, a total of 874 nine-year old children (440 girls, 434 boys) was included in the gambling analyses.

2.3.5 Data analysis

All analyses were performed using R 2.13.0, a language and environment for statistical computing (R Development Core Team, 2011). A significance level of 0.05 was used to determine statistical significance for all calculations.

Univariate and multivariate regression procedures were performed to examine associations between the gambling questions and specific demographic, social and cultural variables.

Binary outcomes for the gambling questions were: 1) Whether respondents had gambled during the previous 12 months, separately for (i) all forms of gambling, (ii) continuous forms of gambling, (iii) Lotto or Keno only, 2) Whether those who gambled usually spent in the upper quartile of expenditure (\geq \$40/month for mothers), and 3) Whether those who had gambled scored positively on the PGSI problem gambling screen.

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, whether smoked, alcohol consumption and number of significant life events experienced in the past 12-months⁶. Additionally, the changes in some of these variables since the previous phase (e.g. increased smoking, becoming separated) were

⁴ The majority of the primary caregivers (91%) were the birth mother of the cohort child. However, a small minority of primary caregivers were adoptive mothers or other family members. There was no statistical evidence that non-birth primary caregivers differed from birth mothers in terms of the analyses presented in this report, thus primary caregivers are reported as mothers throughout this report.

⁵ Some attrition is inevitable as families move and cannot be traced (including emigration) or drop out of the study for personal reasons.

⁶ Significant life events include 23 major changes such as: moving house, changing job, death of family member or close relative, serious illness in the family and unemployment.

included as predictors. Some numerical predictor variables such as age and household income were categorised prior to the analyses.

In some situations, numeric predictor variables were retained in models without being categorised; in these models the presented odds ratio represents the change in odds predicted to be associated with a unit increase in the value of the numeric variable.

With regard to the multiple logistic regression analyses, the selected predictor variables were submitted to a backward stepwise elimination procedure in each of the models. Hosmer-Lemeshow's goodness-of-fit test was conducted to determine whether the model fit was adequate.

Where possible, data from Year 9 were compared with data from Year 6. It is important to note that these were population level comparisons from two cross-sectional points in time (Year 6 and Year 9) and were not a true longitudinal analysis, where only the same participants at both time points would be included in the analyses.

3. RESULTS

This section presents data relating to the mothers and children of the PIF cohort at the Year 9 data collection phase (i.e. when the cohort children were nine years of age).

For mothers, the results presented include socio-demographic data, preferred form of gambling, gambling frequency and 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. Where possible, Year 6 data have been presented alongside the Year 9 data to allow for comparisons and to identify changes over time⁷.

As previous research has indicated that participating in continuous forms of gambling can lead to a greater risk of developing problem gambling than participating in non-continuous forms of gambling, analyses with data collected from mothers has included associations between continuous forms of gambling (i.e., gambling excluding Lotto and Keno), noncontinuous forms of gambling (i.e., Lotto and Keno) and predictor variables.

For children, the results presented include socio-demographic data, gambling participation, with whom the gambling took place, and associations between gambling and various other variables such as the child's behaviour and maternal/environmental factors.

The Year 6 report detailed findings from fathers. Fathers were not interviewed at Year 9 and are thus not mentioned in this report.

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

3.1 Mothers: Descriptive statistics

Demographic data relating to the mothers' gambling activity, frequency and expenditure, preferred form of gambling, whether the mothers had problems due to someone else's gambling, Problem Gambling Severity Index scores, and the lying/betting behaviour of the mothers who reported gambling are presented in this Section. Where possible, information obtained at the Year 9 data collection phase was used in the analyses (with Year 6 data presented for comparison, where appropriate); however, for some demographic information collected once only at baseline (e.g. ethnicity), the six weeks baseline data have been used.

As 79% of mothers participated in both the Year 6 and Year 9 data collection phases and 21% only participated at one of the two phases, there are inevitably some minor differences in demographics between the years caused by the one-fifth different participants at the two phases. Using a chi-squared test there was no statistical evidence to indicate that differences noted between Year 6 and Year 9 in relation to increased gambling prevalence were due the different mothers interviewed at Year 9 in relation to Year 6.

⁷ As indicated on page 17, these were population level comparisons from two cross-sectional points in time (Year 6 and Year 9) and included mothers who were only interviewed at one time point as well as mothers who were interviewed at both time points.

Pacific Islands Families Study 2009. Provider No: 467589, Agreement No: 327774/00 Gambling and Addictions Research Centre, Auckland University of Technology Final Report, re-issued 29 May 2012

3.1.1 Demographic data

Socio-demographic characteristics of the mothers in Year 6 and Year 9 are presented in Table 1. Percentages relate to the Year 6 and Year 9 percentages respectively, unless otherwise specified.

Almost half of the mothers (46%/45%) were of Samoan ethnicity, just less than one quarter (22%/23%) were Tongan, 17%/18% Cook Island and the remainder were of other Pacific or non-Pacific ethnicity. The highest educational status of over half (55%/61%) of mothers was secondary school qualification or less. A majority were partnered (81%/75%), just under half (47%/41%) had a weekly net household income of \$501 to \$1,000, and two-thirds were not New Zealand born (66%/67%). One-third (34%/34%) of the mothers smoked and about one-third (35%/40%) drank alcohol.

A difference was noted between the time points for age of mothers. At both occasions, half of the mothers (53%/48%) were in the 30 to 39 year age bracket. However, there was a greater proportion of mothers aged 40+ years at Year 9 compared to Year 6 (47% vs. 22%) and less aged 20 to 29 years (9% vs. 25%). This is to be expected as the respondents aged by three years between the data collection phases. Another expected time difference was that more respondents had lived in New Zealand for 11 or more years at Year 9 (96%) compared with Year 6 (86%).

There were fewer mothers who reported experiencing no significant life events in the past 12 months at Year 9 (17%) compared with Year 6 (38%). In Year 9, 36% of mothers reported experiencing three or more significant life events in the past 12 months (24% at Year 6).

Cultural orientation, which was measured in Year 6, was not included in the Year 9 questionnaire protocol. Therefore, no data on cultural orientation are presented for Year 9.

	Yea	Year 6		Year 9	
	N	(%)	N	(%)	
Age (years)		(, •)		(,,,)	
20 - 29	237	(24.7)	84	(89)	
30 - 39	510	(53.1)	449	(0.5) (47.5)	
40+	213	(22.2)	412	(47.5)	
	215	(22.2)	712	(45.0)	
Highest educational qualification					
None or Secondary school qualification	525	(54.7)	581	(60.9)	
Post school qualification	135	(34.7) (15.3)	373	(30.1)	
Tost school quanneation	455	(45.5)	515	(39.1)	
Ethnicity					
Samoan	444	(16.2)	380	(110)	
Cook Island	167	(+0.2)	155	(17.0)	
Cook Island Niyaan	107	(17.4)	133	(17.9)	
Niueali	43	(4.7)	43	(3.0)	
Iongan	211	(22.0)	195	(22.5)	
Other Pacific	28	(2.9)	22	(2.5)	
Non Pacific	66	(6.9)	63	(7.3)	
Marital status					
Partnered	776	(80.7)	713	(75.0)	
Non partnered	185	(19.3)	238	(25.0)	
Household weekly income					
\$0 - \$500	217	(22.6)	175	(18.3)	
\$501-\$1,000	449	(46.7)	394	(41.2)	
>\$1,000	258	(26.8)	288	(30.1)	
Unknown	37	(3.9)	100	(10.5)	
Years lived in New Zealand					
6 - 10	137	(14.3)	33	(3.8)	
11 - 20	306	(31.9)	230	(26.6)	
>20	515	(53.8)	602	(69.6)	
	010	(0010)		()	
NZ horn					
No	636	(66.2)	578	(66.7)	
NO Ves	325	(00.2)	280	(00.7)	
105	525	(33.8)	209	(55.5)	
Smoking status					
No.	630	(66.5)	622	(65.6)	
NO Voc	219	(00.5)	226	(03.0)	
Tes	518	(55.5)	520	(34.4)	
Alashal concumption (functionary)					
Alconol consumption (frequency)	(24	$(\mathbf{C}\mathbf{F},1)$	500	(50.7)	
Never 1 1	624	(05.1)	208	(59.7)	
I wo to four times a month or less	312	(32.6)	351	(36.9)	
I wo to three times a week or more	22	(2.3)	32	(3.4)	
Significant life events in past 12 months	2.00	(20)	1		
None	368	(38)	166	(17)	
One	210	(22)	251	(26)	
Two	156	(16)	196	(20)	
Three or more	227	(24)	344	(36)	

Table 1: Mothers - Socio-demographic characteristics

N = 961 at Year 6 and N = 957 at Year 9

Numbers (and percentages) do not always total N (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

Overall participation

In Year 6, 363 mothers gambled. Of those mothers, 90 were no longer gambling in Year 9. Conversely, 199 mothers who were non-gamblers in Year 6 had become gamblers in Year 9 (Table 2).

		Non-Gambler	Gambler	Not interviewed	Total
	Non-Gambler	314	199	125	638
Year 6	Gambler	90	221	52	363
	Not interviewed	74	59		
	Total	478	479		

Table 2: Mothers - Gambling participation in Years 6 and 9

Gambling participation increased from Year 6 to Year 9. In Year 6, 36% (n=363) of the mothers reported taking part in at least one form of gambling activity during the previous 12 months whilst in Year 9 this had increased to 50% (n=479). This included the 199 mothers gambling in Year 9 who had not gambled in Year 6; however, as noted above, 90 mothers also stopped gambling from Year 6 to Year 9. One-third of all mothers had played Lotto (32%) in Year 6 with the participation rate being 46% in Year 9. Overall participation in other forms of gambling was low (less than 10%) at both time points though again an increase in participation was noted in Year 9 compared with Year 6. Housie/bingo and Instant Kiwi were the most popular followed by Keno and electronic gaming machines in a casino. Less than three percent of mothers at either time point participated in electronic gaming machines in pubs. All other forms of gambling were participated in by one percent or less of the mothers at both time points (Figure 1). Actual numbers of mothers participating in each form of gambling activity are presented in Appendix 4.



Figure 1: Mothers - Gambling per activity, percentage of all mothers

Gambler participation

Percentage participation for each of the gambling forms was relatively similar in Year 6 and Year 9 when only the data from mothers who gambled was examined. Almost all had played Lotto (89%, 92%) with overall participation in other forms of gambling being low at 15% or less. Some forms of gambling were participated in at Year 9 which had not been noted at Year 6; the participation levels were low at one percent or less and included horse/dog racing and internet based gambling. Club electronic gaming machine gambling was noted at Year 9; however, this question was not asked at Year 6 (Figure 2). Actual numbers of mothers who gambled participating in each form of gambling activity are presented in Appendix 4.

Of the mothers who gambled, a majority (77% Year 6, 67% Year 9) only gambled on one activity with the remaining respondents gambling on multiple forms, ranging from two to five (Year 6) or two to eight (Year 9).



Figure 2: Mothers - Gambling per activity, percentage of mothers who gambled

In Year 9, over half of the mothers who had gambled (55%) did not respond to the question regarding preferred form of gambling. Of the 45% who did respond, Lotto was the most preferred form at 77% (80% in Year 6) followed by Housie/bingo at 10% (nine percent in Year 6). Each of the other forms of gambling was the most preferred form by five percent or less of the respondents.

3.1.3 Gambling frequency

In Year 9, the only form of gambling where frequency of play was reported to be daily or almost daily was for Keno (3.7% of Keno gamblers). However, the majority of Keno gamblers reported playing weekly (56%). For the other main forms of gambling (Lotto, Instant Kiwi and Housie/bingo), frequency of play was reported to be either less than monthly, monthly, or weekly with weekly being the most frequent in each case (range 36% to 48%). For casino electronic gaming machines, the majority of mothers who had gambled on them reported playing either less than monthly (49%) or monthly (44%), whilst for pub electronic gaming machines a majority reported playing monthly (54%).

3.1.4 Gambling expenditure

The overall median monthly expenditure on gambling was lower in Year 9 (median \$20, range \$1 to \$485) than it had been in Year 6 (median \$47, range \$1 to 628)⁸. This finding may be an artefact of data collection whereby usual *monthly* expenditure was collected in Year 9 versus usual *weekly* expenditure in Year 6. The Year 6 weekly data were extrapolated to monthly data for the purposes of this comparison. However, Year 6 respondents may have over-estimated weekly expenditure and such an error would then have been compounded when the values were multiplied up to monthly equivalents. For this reason, only Year 9 data are presented below.

In Year 9, the highest median usual monthly expenditure was noted for casino electronic gaming machine gambling (\$40) which was participated in by only nine percent of the mothers who had gambled. The next highest median monthly expenditure was for Housie/ bingo (\$30) participated in by only 14% of the mothers who had gambled. Conversely, the median monthly expenditure for Lotto which was participated in by 92% of the mothers who had gambled was lower at \$15. This shows a positive skew to the data, the implication of which is discussed later in this report. Findings for the main gambling activities are presented in Figure 3; some activities have been amalgamated and presented as 'other gambling' due to small sample sizes.



Figure 3: Mothers - Median usual monthly expenditure per gambling activity in Year 9

There was some indication of ethnic differences in median monthly expenditure on the different gambling forms, in particular for Housie/bingo and non-casino electronic gaming machine participation. Niueans had a higher median expenditure for both of these forms of gambling than any of the other ethnicities. For Housie/bingo this was \$50 versus \$20 to \$30 for the other ethnicities, and for non-casino electronic gaming machines it was \$120 versus \$20 to \$50. However, as only one Niuean participated in Housie/bingo and only three participated in non-casino electronic gaming machines, these findings should be treated with the utmost caution.

⁸ *Weekly* gambling expenditure data were collected in Year 6 whilst *monthly* data were collected in Year 9. Thus, Year 6 data were multiplied by 4.3 to generate monthly equivalent data for comparative purposes with Year 9 data.

3.1.5 Problems due to someone else's gambling

A very small minority of mothers reported having problems due to someone else's gambling in Year 9 (2.6%, n=25). This was less than in Year 6 (4.1%, n=41). Of the affected mothers in Year 9, a majority (15/25) reported that the problems were due to someone else's involvement with casino electronic gaming machines, followed by non-casino electronic gaming machines (11/25), casino table games (8/25) and sports betting (6/25). The remainder of the other gambling forms were reported to be problematic by five or less of the affected mothers. A similar number of mothers in Year 6 and Year 9 reported being affected by each of the modes of someone else's gambling, except for casino electronic gaming machines (23 vs. 15 Year 6/Year9), table games (0 vs. 8) and internet-based gambling (0 vs. 3). (Figure 4).

The number of different forms of gambling which were reported to be participated in by someone else and which were causing a problem to the mothers was up to eight in Year 9 (compared with up to six forms in Year 6). However, the majority of the affected mothers reported one or two gambling forms to be problematic (18/25 Year 9, 36/41 Year 6).



Figure 4: Mothers - Number affected per mode of gambling

In Year 9, the relationship of the other person who gambled was generally a close family member: spouse/partner (n=9), sibling (n=8) and parent (n=6). Other relationships were uncle/aunt (n=4) and extended family member (n=1) (Table 3).

Table 3: Mothers - Relationship of other person in Year 9

Relationship	Ν
Spouse/partner	9
Sibling	8
Parent	6
Uncle/aunt	4
Extended family	1

Multiple options could be endorsed

The problems caused to mothers by another person's gambling were varied and generally, multiple negative effects were experienced. The majority sometimes worried about the gambling (n=23), and over half were financially paying for the other person's gambling

(n=14). One quarter of mothers (n=6) were concerned for their own safety and four reported that the other person's gambling was affecting their (the mother's) health. Over a third of mothers (n=9) reported that it was hard to talk about the other person's gambling and another third (n=8) reported that there were other negative effects (Table 4). Only four of the 25 affected mothers reported one negative effect (all were 'worry about it sometimes'); the remaining 21 mothers reported multiple negative effects ranging from two to all six detailed in Table 4.

Samples sizes were too small to allow for further meaningful analyses investigating negative effects and relationships.

Effect	Ν	(%)
I worry about it sometimes	23	(92)
I am paying for it financially	14	(56)
It is hard to talk about	9	(36)
I am concerned about my safety	6	(24)
It is affecting my health	4	(16)
Other effect	8	(32)

Multiple options could be endorsed

3.1.6 Problem Gambling Severity Index scores

Figure 5 presents the distribution of Problem Gambling Severity Index (PGSI) scores for the mothers who had gambled in the previous 12 months at the Year 6 and Year 9 time points. Very few were classified as low risk/moderate risk/problem gambler.

At both time points, the majority (84%, n=250 Year 6; 90% n=367 Year 9) of mothers scored zero on the PGSI indicating non-problem gambler status. Fewer mothers were classified as low risk gamblers (scored one or two) in Year 9 (5%, n=22) compared with Year 6 (12%, n=35). At both time points, moderate risk gamblers (PGSI score three to seven) comprised three percent of mothers (n=10 Year 6, n=13 Year 9), and one percent of the mothers who gambled were classified as problem gamblers (n=4 Year 6, n=5 Year 9). Although the potential range of scores was zero to 27, the highest score (one respondent) was 18 in Year 9 (12 in Year 6).



Figure 5: Mothers - Distribution of PGSI scores in Years 6 and 9

Of the 711 mothers who were assessed at both the Year 6 and Year 9 phases and who answered all PGSI questions (whether or not they gambled), 432 (61%) maintained the same

gambling classification across the three years. The remaining 279 (39%) changed gambling classification (Table 5).

One hundred and seventy-three mothers who had not gambled in the past 12-months in Year 6 became gamblers in Year 9; whilst the majority (n=154) were classified with the PGSI as non-problem gamblers, 18 mothers were classified as low or moderate risk gamblers (nine in each category) and one mother was classified as a problem gambler. Conversely, 75 past-year gamblers in Year 6 were non-gamblers in Year 9; this included 61 non-problem gamblers, 11 low risk gamblers, two moderate risk gamblers and one problem gambler in Year 6 being non-gamblers in Year 9.

Of mothers who had gambled in the previous 12-months both in Year 6 and Year 9, all 10 mothers who increased PGSI classification in Year 9 changed from being non-problem gamblers to being low risk gamblers (n=6), moderate risk gamblers (n=2) or problem gamblers (n=2). Fourteen low risk gamblers in Year 6 were classified as non-problem gamblers in Year 9. Four moderate risk gamblers in Year 6 were either low risk gamblers (n=1) or non-problem gamblers (n=3) in Year 9. Three problem gamblers identified in Year 6 were classified as non-problem gamblers in Year 9.

		Year 9 (N)				
		Non- gambler	Non- problem gambler	Low risk gambler	Moderate risk gambler	Problem gambler
	Non-gambler	312	154	9	9	1
(Z)	Non-problem gambler	61	118	6	2	2
r 6	Low risk gambler	11	14	1	0	0
Yea	Moderate risk gambler	2	3	1	1	0
	Problem gambler	1	3	0	0	0

Table 5: Mothers - Gambling classification in Years 6 and 9

N=711, missing data either due to participant not being seen at both time points or by PGSI questions being unanswered

3.1.7 Lying and betting

In both Year 6 and Year 9, the majority of mothers who had gambled (over 95%) had never lied to family members or others to hide their gambling, had never bet or spent more money than they wanted to on gambling, and had never wanted to stop betting money or gambling but did not think they could (Table 6).

Although the three questions regarding lying, betting or wanting to stop gambling but did not think they could are 'life time' questions, i.e. asked as "have you *ever*..." only one respondent responded "yes" to a question in both years. This related to betting/spending more than intended. It should be noted that the questions were asked differently at the two phases. In Year 6, they were asked in a past 12-month time frame and with a multiple frequency response format, whilst in Year 9 they were asked as a true life time question with a dichotomous (Yes/No) response format. These differences are likely to have contributed to the poor correlation between responses between Year 6 and Year 9. Additionally, the poor correlation may indicate that the mothers did not respond to the questions as life time questions.

8		8	8						
	Year 6					Year 9			
	Ŋ	les	No		Yes		ľ	No	
	Ν	(%)	Ν	(%)	Ν	(%)	Ν	(%)	
Lied to hide gambling	4	(1.3)	295	(99.7)	10	(2.5)	396	(97.5)	
Bet/spent more than intended	11	(3.7)	288	(96.3)	18	(4.4)	388	(95.6)	
Wanting to stop betting/ gambling but could not	15	(5.0)	284	(95.0)	10	(2.5)	395	(97.5)	
Bet/spent more than intended Wanting to stop betting/ gambling but could not	11	(3.7)	288 284	(96.3)	18	(4.4)	388 395	(95 (97	

Table 6: Mothers - Percentages of lying and betting behaviour

N=299 Year 6, N=406 Year 9

3.2 Mothers: Association statistics

This Section presents data pertaining to the mothers, of associations between gambling/at risk/problem gambling and specific socio-demographic variables, as well as associations between gambling/at risk/problem gambling and alcohol and tobacco usage. Associations between the lying and betting questions, and the PGSI are also presented.

Gambling types have traditionally been categorised into continuous and non-continuous forms. Continuous forms of gambling are generally recognised as being those which involve rapid stakes, play and determination of outcomes such as playing electronic gaming machines, casino table games, scratch cards, and TAB gambling (in this study, classified as all forms except Lotto and Keno). Non-continuous forms of gambling are those where there is a time delay between laying the stake and knowing the outcome (Abbott, 2001a). As participating in continuous forms of gambling has been linked with a higher risk of developing problem gambling (Abbott, 2001b), association analyses were also performed for mothers who gambled on continuous forms and specific socio-demographic variables, as well as for mothers who only participated in Lotto and Keno (non-continuous forms). Whilst categorising gambling forms into continuous and non-continuous is broad level, the small sample size for participants in any form of gambling apart from Lotto, precluded analyses being conducted by smaller categorisations or individual forms of gambling.

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

Where possible, information obtained at the Year 9 data collection point was used in the analyses compared with the change from the same Year 6 data; however, for some demographic information collected once only at baseline (e.g. ethnicity), the six-weeks baseline data have been used.

3.2.1 Demographic factors

Table 7 details univariate odds ratios in Year 9 of mothers gambling in the previous 12 months and associations with various socio-demographic variables which attained a level of statistical significance. Statistical significance was attained for mothers who gambled in Year 6, and for mothers' ethnicity, as well as changes from Year 6 to Year 9 for total household income, smoking, and alcohol consumption.

Analyses which did not achieve a level of statistical significance have not been presented. These related to age and educational level (which had shown a relationship to gambling at the Year 6 analyses) and number of significant life events experienced in the past 12 months.

Mothers who had gambled in Year 6 had 4.4 times greater odds for gambling in Year 9 than mothers who had not gambled in Year 6. Cook Island mothers had 1.6 times greater odds for gambling than Samoan mothers. This finding was not noted at Year 6, when the only ethnic finding was that Tongan mothers had lower odds for gambling than Samoan mothers. Additionally, this finding was not retained in the multivariate analyses which controlled for confounding variables, and is thus likely to be of minimal or no importance.

Mothers had statistically significant greater odds for gambling in Year 9 (1.62 times) if their partner gambled in Year 6. However, this association was not retained in the multivariate analyses and is thus likely to be spurious.

Mothers whose weekly total household income had decreased (i.e. their financial situation had worsened) from Year 6 to Year 9 had twice as high odds to gamble than mothers whose total household income had remained stable over the three-year period. Where the weekly household income change was unknown, increased odds for gambling were also noted. However, the importance of this finding cannot be determined due to the unknown nature of the data.

Increased frequency of alcohol consumption from Year 6 to Year 9 was also associated with being a gambler, at 1.7 times greater odds than for mothers whose frequency of alcohol consumption had remained the same over that time period. Similarly, mothers who smoked more cigarettes in Year 9 than in Year 6 had 2.4 times greater odds for gambling than mothers who cigarette smoking had not changed.

Variable	Category	Gambled in past 12			Univariate odds ratio		
		months					
		Yes	(%)	No	(%)	OR	(95% CI)
Gambler at Year 6	No	171	(37)	296	(63)	1.00	
	Yes	206	(72)	81	(28)	4.40	(3.20, 6.05)***
Ethnicity	Samoan	160	(48)	173	(52)	1.00	
Lennerty	Cook Island	78	(60)	53	(32)	1.59	(1.06, 2.40)*
	Niuean	20	(57)	15	(43)	1.44	(0.71, 2.91)
	Tongan	73	(42)	100	(58)	0.79	(0.54, 1.14)
	Other Pacific [#]	11	(65)	6	(35)	1.98	(0.72, 5.48)
	Non Pacific	26	(54)	22	(46)	1.28	(0.70, 2.34)
Marital status change	Staved come	224	(51)	222	(40)	1.00	
Vaar 6 to Vaar 0	Deceme pertnered	334 16	(31)	322 19	(49)	1.00	(0, 42, 1, 71)
Tear o to Tear 9	Separated	10	(47)	10	(55)	0.80	(0.45, 1.71) (0.28, 1.14)
	Separated	24	(41)	33	(59)	0.00	(0.38, 1.14)
Partner gambled at	No	287	(48)	316	(52)	1.00	
Year 6	Yes	90	(60)	61	(40)	1.62	(1.13, 2.33)**
House income change	Staved same	124	(44)	155	(56)	1.00	
Year 6 to Year 9	Increased	56	(46)	67	(54)	1.04	(0.68, 1.60)
	Decreased	34	(62)	21	(38)	2.02	(1.12, 3.66)*
	Unknown	163	(55)	134	(45)	1.52	(1.09, 2.11)*
a 11 1		220		076	(- -)	1 00	
Smoking change	Stayed same	229	(45)	276	(55)	1.00	(1, (1, 0, (0))))
Year 6 to Year 9	Increased smoking	86	(67)	43	(33)	2.41	(1.61, 3.62)***
	Decreased smoking	57	(55)	46	(45)	1.49	(0.98, 2.29)
Alcohol consumption	Stayed same	266	(48)	285	(52)	1.00	
(frequency) change	Increased	68	(61)	44	(39)	1.66	(1.09, 2.51)*
Year 6 to Year 9	Decreased	42	(51)	41	(49)	1.10	(0.69, 1.74)

Table 7: Mothers - Numbers, percentages and univariate odds ratios for gambling in Year 9

Numbers vary due to missing data for some variables

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

In the multivariate logistic regression analyses, all variables retained their significant associations with gambling activity with the exception of ethnicity and whether the partner had gambled at Year 6 (Table 8). In addition, mothers whose marital status had changed from being partnered to being separated had statistically lower odds for gambling (0.4 times lower) in comparison with those whose marital status remained unchanged from Year 6 to Year 9.

Variable	Category	Adjust	Adjusted odds ratio			
		OR	(95% CI)			
Gambler at Year 6	No	1.00				
	Yes	4.61	(3.30, 6.44)***			
Marital status change	Stayed same	1.00				
Year 6 to Year 9	Became partnered	0.74	(0.33, 1.64)			
	Separated	0.43	(0.23, 0.81)**			
House income change	Stayed same	1.00				
Year 6 to Year 9	Increased	1.26	(0.77, 2.04)			
	Decreased	2.52	(1.29, 4.91)**			
	Unknown	1.50	(1.03, 2.16)*			
Smoking change	Stayed same	1.00				
Year 6 to Year 9	Increased smoking	2.12	(1.36, 3.31)***			
	Decreased smoking	1.37	(0.86, 2.20)			
Alcohol consumption	Stayed same	1.00				
(frequency) change	Increased	1.61	(1.02, 2.56)*			
Year 6 to Year 9	Decreased	0.97	(0.57, 1.64)*			

 Table 8: Mothers - Adjusted odds ratios for gambling

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

3.2.2 Gambling expenditure

Table 9 details univariate odds ratios in Year 9 of mothers who spent \$40 or more (upper quartile of expenditure) per month on gambling in the previous 12 months and associations with various socio-demographic variables, which attained a level of statistical significance. Statistical significance was attained for mothers who gambled in Year 6, for those who had a weekly gambling expenditure of \$14 or more in Year 6, for mothers who had changes from Year 6 to Year 9 in smoking, and for mothers who had experienced one or more significant life events in the previous 12 months.

Analyses of socio-demographic variables detailed in Table 1 which did not achieve a level of statistical significance have not been presented.

Mothers who had gambled in Year 6 on Lotto or Keno only (i.e. non-continuous forms of gambling) had 1.78 times greater odds of a monthly gambling expenditure in the upper quartile (\geq \$40) in Year 9 than mothers who had not gambled in Year 6. Mothers who in Year 6 had a weekly gambling expenditure of \$14 or more also had greater odds (1.93 times) of a gambling expenditure in the upper quartile in Year 9, compared with mothers whose gambling expenditure was five dollars or less in Year 6. Additionally, mothers who smoked more cigarettes in Year 9 than in Year 6 had 1.9 times greater odds of the higher gambling expenditure than mothers whose cigarette smoking had not changed. However, as statistical significance was not retained in the multivariate analyses which controlled for confounding variables, these findings are likely to be of minimal or no importance.

Mothers who reported experiencing at least one significant life event in the previous 12 months had between four to five times greater odds of a monthly gambling expenditure in the upper quartile (\geq \$40) in Year 9 than mothers who had not experienced any significant life events in the previous 12 months.

Variable	Category	Spending ≥\$40/month			Univariate odds ratio		
		Yes	(%)	No	(%)	OR	(95% CI)
Gambler at Year 6	No	32	(19)	139	(81)	1.00	
	Lotto/Keno only	43	(29)	105	(71)	1.78	(1.05, 3.00)*
	Continuous forms	18	(31)	40	(69)	1.95	(0.99, 3.84)
Weekly expenditure	≤\$5	40	(20)	157	(80)	1.00	
at Year 6	\$6 - \$13	23	(26)	66	(74)	1.37	(0.76, 2.46)
	\geq \$14	30	(33)	61	(67)	1.93	(1.10, 3.37)*
Smoking change	Stayed same	46	(20)	183	(80)	1.00	
Year 6 to Year 9	Increased smoking	28	(33)	58	(67)	1.92	(1.10, 3.35)*
	Decreased smoking	18	(32)	39	(68)	1.84	(0.96, 3.50)
Significant life events	None	6	(8)	68	(92)	1.00	
in past 12 months	One	25	(28)	63	(72)	4.50	(1.73, 11.68)**
*	Two	23	(30)	53	(70)	4.92	(1.87, 12.94)**
	Three or more	39	(28)	100	(72)	4.42	(1.77, 11.01)**

Table 9: Mothers - Numbers, percentages and univariate odds ratios for spending ≥\$40/month in Year 9

Numbers vary due to missing data for some variables

* P < 0.05, ** P < 0.01

In the multivariate logistic regression analyses, the only association which retained its level of statistical significance was between gambling expenditure in the upper quartile and mothers who had experienced at least one significant life event in the previous 12 months (Table 10). However, some caution is advised in the interpretation of this finding as there were only six mothers (very small sample) who had not experienced any significant life events but who had expenditure in the upper quartile.

Variable	Category	Adjusted odds ratio			
		OR	(95% CI)		
Significant life events	None	1.00			
In past 12 months	One	4.50	(1.73, 11.68)**		
	Two	4.92	(1.87, 12.94)**		
	Three or more	4.42	(1.77, 11.01)**		

Table 10: Mothers - Adjusted odds ratios for spending ≥\$40/month in Year 9

** *P* < 0.01

3.2.3 Problem Gambling Severity Index

Due to the small numbers of participants classified as low risk, moderate risk or problem gambler (i.e. scored >0 on the PGSI), analyses of PGSI scores associated with demographic variables had to be conducted on those mothers who scored >0 versus those who had scored zero (non-problem gambler).

Table 11 details univariate odds ratios of mothers being low/moderate risk gamblers or problem gamblers in Year 9 associated with various socio-demographic variables, and where a level of statistical significance was attained. Statistical significance was only attained for mothers who smoked in Year 9. Although the sample size was small necessitating that this finding should be treated with caution, the statistical significance was retained in the multivariate logistic regression analyses (Table 12) and indicates that being a smoker is associated with being at risk/problem gambler. Analyses were not possible on smoking status change and PGSI score due to the very small sample size of those who smoked and were an at risk/problem gambler.

Analyses of socio-demographic variables detailed in Table 1 which did not achieve a level of statistical significance have not been presented.

Table 11: Mothers - Numbers,	percentages and	univariate odds	ratios of being at risk/
problem gamblers in Year 9			

Variable	Category	At risk/problem gambler				Univariate odds rati		
		Yes	(%)	No	(%)	OR	(95% CI)	
Smoking	No	11	(34)	172	(59)	1.00		
C	Yes	21	(66)	120	(41)	2.74	(1.27, 5.89)**	

** *P* < 0.01

Table 12: Mothers - A	djusted odds rat	tios of being at ris	k/problem	gamblers in `	Year 9
-----------------------	------------------	----------------------	-----------	---------------	--------

Variable	Category	Adjusted odds		
		OR	(95% CI)	
Smoking	No	1.00		
-	Yes	2.74	(1.27, 5.89)**	

** *P* < 0.01

3.2.4 Lying and betting associated with Problem Gambling Severity Index

Lying about gambling

Nine of the 10 mothers who had responded positively (Yes) to the question about lying to hide their gambling in Year 9 fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 22.5% of the at risk/problem gamblers (compared to 9.1% at Year 6). One of the PGSI classified non-problem gamblers responded positively (Yes) to the question about lying, compared to none at Year 6.

Bet or spent more money than intended

Thirteen of the 18 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 32.5% of the at risk/problem gamblers (compared to 25% at Year 6). Five of the PGSI classified non-problem gamblers responded positively (Yes) to the question about betting or spending more money than intended on gambling, compared to none at Year 6.

Wanted to stop betting/gambling

Eight of the 10 mothers who wanted to stop betting/gambling in Year 9 but did not feel able to fell within the at risk/problem gambler PGSI dichotomised classifications; this represented 20% of the at risk/problem gamblers (compared to 27% at Year 6). Two of the PGSI classified non-problem gamblers responded positively (Yes) to the question about wanting to stop betting/gambling but did not feel able to, compared to two at Year 6.

3.2.5 Participating in continuous forms of gambling

Table 13 details univariate odds ratios in Year 9 of mothers gambling on continuous forms (all gambling activities except Lotto and Keno) in the previous 12 months and associations with various socio-demographic variables which attained a level of statistical significance. Statistical significance was attained for mothers who gambled in Year 6, and for mothers' ethnicity, as well as changes from Year 6 to Year 9 for total household income, smoking, and alcohol consumption, for mothers who had problems due to someone else's gambling, and for mothers who had experienced two or more significant life events in the previous 12 months.

Analyses which did not achieve a level of statistical significance have not been presented. These related to the socio-demographic variables detailed in Table 1.

Mothers who gambled in Year 6, had higher odds for gambling on continuous forms in Year 9, compared to mothers who had not gambled in Year 6. This was true for mothers who had only gambled on Lotto or Keno in Year 6 (1.98 times greater odds) and to a greater extent for mothers who had gambled on continuous forms in Year 6 (4.51 times greater odds).

Cook Island mothers had 1.75 times greater odds for gambling on continuous forms in Year 9 than Samoan mothers. However, this finding was not retained in the multivariate analyses which controlled for confounding variables, and is thus likely to be of minimal or no importance.

Mothers who drank alcohol in Year 9 had greater odds for gambling on continuous forms than mothers who did not drink alcohol. Additionally, increased frequency of alcohol consumption from Year 6 to Year 9 was associated with being a gambler on continuous forms in Year 9, at 1.7 times greater odds than for mothers whose frequency of alcohol consumption had remained the same over that time period. However, as this finding was not retained in the multivariate analyses it is also likely to be of minimal or no importance.

Mothers who smoked cigarettes in Year 9 had greater odds for gambling on continuous forms than mothers who did not smoke (2.88 times). Mothers who smoked more or less cigarettes in Year 9 than in Year 6 also had greater odds for gambling on continuous forms than mothers whose cigarette smoking had not changed.

Mothers who reported problems because of someone else's gambling had three times greater odds for gambling on continuous forms in Year 9 than mothers who did not have problems with someone else's gambling. However, due to the very small sample size and the fact that this finding was not retained when confounding variables were controlled for, it is unlikely to be of importance.

Mothers who reported experiencing two, or three or more significant life events in the previous 12 months had just over twice as great odds for gambling on continuous forms than mothers who had not experienced any significant life events in the previous 12 months. However, as this finding was not retained in the multivariate analyses it is unlikely to be of importance.

To assess for socio-economic deprivation, a variable was derived based on the NZiDep (New Zealand index of socio-economic deprivation for individuals) which is designed for use as a variable in research and for examining the relationships between socio-economic status and health/social outcomes (Salmond, Crampton, King, & Waldegrave, 2006). The variables included in the NZiDep in the current study included those related to receiving social security benefits, financial difficulty (assessed by a range of measures) and unemployment. Higher

scores relate to higher levels of socio-economic deprivation. No association was found in the univariate analyses between NZiDep and gambling on continuous forms.

Variable Category			Continuous gambler				Univariate odds ratio		
		Yes	(%)	No	(%)	OR	(95%		
						CI)			
~					(2.2)				
Gambler at Year 6	No	58	(12)	409	(88)	1.00			
	Lotto/Keno only	45	(22)	160	(78)	1.98	(1.29, 3.05)**		
	Continuous forms	32	(39)	50	(61)	4.51	(2.68, 7.61)***		
Ethnicity	Samoan	50	(15)	283	(85)	1.00			
2000000	Cook Island	31	(24)	100	(76)	1.75	(1.06, 2.90)*		
	Niuean	8	(23)	27	(77)	1.68	(0.72, 3.90)		
	Tongan	32	(19)	141	(82)	1.00	(0.72, 3.90) (0.79, 2.09)		
	Other Pacific [#]	3	(19)	14	(82)	1.20	(0.34, 4.37)		
	Non Pacific	7	(10)	41	(82)	0.97	(0.31, 1.37) (0.41, 2.27)		
		,	(15)		(05)	0.77	(0.11, 2.27)		
NZiDep deprivation	Zero	34	(16)	182	(84)	1.00			
characteristics	One or two	74	(22)	270	(78)	1.47	(0.94, 2.30)		
	Three or more	27	(14)	167	(86)	0.87	(0.50, 1.50)		
			~ /		()				
Smoker (Year 9)	No	62	(12)	425	(88)	1.00			
· · · · ·	Yes	73	(29)	178	(71)	2.88	(1.97, 4.21)***		
					` '				
Smoking change	Stayed same	68	(13)	437	(87)	1.00			
Year 6 to Year 9	Increased smoking	38	(29)	91	(71)	2.68	(1.70, 4.24)***		
	Decreased smoking	28	(27)	75	(73)	2.40	(1.45, 3.97)***		
	-								
Alcohol consumption	Never	64	(14)	392	(86)	1.00			
(frequency) Year 9	2 - 4 times/month or less	64	(24)	208	(76)	1.88	(1.28, 2.77)**		
	2 - 3 times/week or more	7	(33)	14	(67)	3.06	(1.19, 7.88)*		
Alcohol consumption	Stayed same	89	(16)	462	(84)	1.00			
(frequency) change	Increased	28	(25)	84	(75)	1.73	(1.07, 2.81)*		
Year 6 to Year 9	Decreased	18	(22)	65	(78)	1.44	(0.81, 2.54)		
Problems due to	No	128	(17)	605	(83)	1.00			
someone else's	Yes	7	(39)	11	(61)	3.01	(1.14, 7.91)*		
gambling									
	N 7		(1.4)	107	(0.0)	1.00			
Significant life events	None	16	(11)	125	(89)	1.00			
in past 12 months	Une	30	(15)	167	(85)	1.40	(0.73, 2.69)		
	1 wo	34	(22)	122	(78)	2.18	(1.14, 4.15)*		
	Three or more	55	(21)	205	(79)	2.10	(1.15, 3.82)*		

Table 13: Mothers - Numbers, J	percentages and	univariate odds	ratios for	continuous
gambling in Year 9				

Numbers vary due to missing data for some variables

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

In the multivariate logistic regression analyses, gambling participation in Year 6 (on noncontinuous and continuous forms of gambling) and being a smoker at Year 9 retained their significant associations with continuous gambling activity. Additionally, a statistically significant association was noted between mothers with one or two NZiDep deprivation characteristics (mild deprivation) and gambling on continuous forms, with higher odds of 1.74 times compared with mothers who had no level of deprivation (Table 14).

Variable	Category	Adjusted odds ratio			
		OR	(95% CI)		
Gambler at Year 6	No	1.00			
	Lotto/Keno only	2.10	(1.34, 3.29)**		
	Continuous forms	3.77	(2.15, 6.61)***		
NZiDep deprivation	Zero	1.00			
characteristics	One or two	1.74	(1.07, 2.84)*		
	Three or more	0.84	(0.47, 1.52)		
Smoker Year 9	No	1.00			
	Yes	2.75	(1.82, 4.15)***		

Table 14: Mothers - Adjusted odds ratios for continuous gambling in Year 9

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

3.2.6 Participating in non-continuous forms of gambling (Lotto and Keno only)

Table 15 details univariate odds ratios in Year 9 of mothers gambling on non-continuous forms (Lotto and Keno only) in the previous 12 months and associations with various sociodemographic variables which attained a level of statistical significance. Statistical significance was attained for mothers who gambled in Year 6; for mothers' age, ethnicity, social marital status, total weekly household income, frequency of alcohol consumption, changes from Year 6 to Year 9 for social marital status; and for mothers who had experienced one or two significant life events in the previous 12 months.

Analyses which did not achieve a level of statistical significance have not been presented. These related to the socio-demographic variables detailed in Table 1 as well as NZiDep, change in alcohol consumption from Year 6 to Year 9 and problems due to someone else's gambling.

Mothers who gambled in Year 6 on continuous forms and also mothers who did not gamble in Year 6 were less likely to gamble (0.46, 0.32 times lower odds, respectively) on non-continuous forms in Year 9, compared to mothers who had only gambled on non-continuous forms⁹ in Year 6.

Mothers aged 30 to 39 years had twice as great odds for gambling on non-continuous forms compared to mothers aged 20 to 29 years. Tongan mothers had 0.63 times lower odds for gambling on non-continuous forms in Year 9 than Samoan mothers. Mothers whose weekly total household income was over \$1,000 had 1.87 times greater odds for gambling on non-continuous forms than mothers whose household income was \$500 or less per week. However, these findings were not retained in the multivariate analyses which controlled for confounding variables, and are thus likely to be of minimal or no importance. Where the weekly household income and the change were unknown, higher odds for gambling on non-continuous forms was also noted. However, the importance of these findings cannot be determined due to the unknown nature of the data.

Non-partnered mothers also had lower odds for gambling on non-continuous forms (0.65 times lower) than mothers who had a partner. When marital status change from Year 6 to Year 9 was examined, mothers who had separated in that time period had half the odds for gambling on non-continuous forms as mothers whose marital status had remained the same.

⁹ For this analysis, non-continuous gambling in Year 6 was used as the reference point to allow for comparison between non-continuous gambling and subsequent continuous gambling in Year 9.

Mothers who drank alcohol in Year 9 two to four times a month or less had greater odds for gambling on non-continuous forms (1.71 times greater) than mothers who did not drink alcohol. This finding was not retained when confounding variables were controlled for, and is thus unlikely to be of importance.

Mothers who reported experiencing one or two significant life events in the previous 12 months had slightly lower odds for gambling on non-continuous forms than mothers who had not experienced any significant life events in the previous 12 months. However, as this finding was not retained in the multivariate analyses it is unlikely to be of importance.

Variable	Category	Non-o	continuo	ous gan	nbler	Univa	riate odds ratio
		Yes	(%)	No	(%)	OR	(95% CI)
Gambler at Year 6	No	113	(24)	354	(76)	0.32	(0.22, 0.45)***
	Lotto/Keno only	103	(50)	102	(50)	1.00	
	Continuous forms	26	(32)	56	(68)	0.46	(0.28, 0.85)*
Age (years)	20 - 29	13	(23)	44	(77)	1.00	
	30 - 39	135	(37)	228	(63)	2.00	(1.04, 3.86)*
	40 - 49	85	(28)	214	(72)	1.34	(0.69, 2.62)
	50+	8	(27)	22	(73)	1.23	(0.44, 3.41)
Ethnicity	Samoan	110	(33)	223	(67)	1.00	
	Cook Island	47	(36)	84	(64)	1.13	(1.74, 1.73)
	Niuean	12	(34)	23	(66)	1.06	(0.51, 2.20)
	Tongan	41	(24)	132	(76)	0.63	(0.41, 0.96)*
	Other Pacific [#]	8	(47)	9	(53)	1.80	(0.68, 4.80)
	Non Pacific	19	(40)	29	(60)	1.33	(0.71, 2.47)
Social marital status	Partnered	200	(34)	390	(66)	1.00	
	Non-partnered	40	(25)	120	(75)	0.65	(0.44, 0.97)*
	L						
Marital status change	Stayed same	220	(34)	436	(66)	1.00	
Year 6 to Year 9	Became partnered	7	(21)	27	(79)	0.51	(0.22, 1.20)
	Separated	12	(20)	47	(80)	0.51	(0.26, 0.97)*
Household weekly	\$0 - \$500	19	(22)	68	(78)	1.00	
income	\$501-\$1.000	54	(24)	169	(76)	1.14	(0.63, 2.07)
	>\$1.000	55	(34)	105	(66)	1.87	$(1.02, 3.43)^*$
	Unknown	114	(40)	170	(60)	2.40	(1.37, 4.21)**
II	Stored come	70	(25)	200	(75)	1.00	
House income change		70	(23)	209	(73)	1.00	(0.71, 1.94)
	Degrad	34 10	(28)	09 27	(12)	1.14	(0.71, 1.64) (0.78, 2.71)
	Decreased	18	(33)	3/	(6/)	1.45	(0.78, 2.71) (1.42, 2.80)***
	Unknown	120	(40)	1//	(60)	2.02	(1.42, 2.89)***
Alcohol consumption	Never	127	(28)	329	(72)	1.00	
(frequency) Year 9	2 - 4 times/month or less	108	(40)	164	(60)	1.71	(1.24, 2.34)***
	2 - 3 times/week or more	6	(29)	15	(71)	1.04	(0.39, 2.73)
Significant life events	None	58	(41)	83	(59)	1.00	
in past 12 months	One	58	(29)	139	(71)	0.60	(0.38, 0.94)*
1	Two	42	(27)	114	(73)	0.53	(0.32, 0.86)*
	Three or more	84	(32)	176	(68)	0.68	(0.45, 1.04)

 Table 15: Mothers - Numbers, percentages and univariate odds ratios for non-continuous gambling in Year 9

Numbers vary due to missing data for some variables *P < 0.05, **P < 0.01, ***P < 0.001

Pacific Islands Families Study 2009. Provider No: 467589, Agreement No: 327774/00 Gambling and Addictions Research Centre, Auckland University of Technology Final Report, re-issued 29 May 2012 In the multivariate logistic regression analyses, only gambling participation in Year 6 and becoming non-partnered in Year 9 retained their significant associations with non-continuous gambling activity (Table 16); the other univariate analysis findings are likely to have been spurious.

Variable	Category	Adjusted odds ratio		
		OR	(95% CI)	
Gambler at Year 6	No	0.31	(0.22, 0.45)***	
	Lotto/Keno only	1.00		
	Continuous forms	0.49	(0.28, 0.85)*	
Social marital status	Partnered	1.00		
	Non-partnered	0.62	(0.41, 0.95)*	

 Table 16: Mothers - Adjusted odds ratios for non-continuous gambling in Year 9

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

3.2.7 Analyses with non-significant associations

Several further association analyses were performed where no level of statistical significance was attained and thus no association between the variable and mothers' gambling was identified. In the interests of readability of this report, these null result data have not been presented. Some of these have been previously mentioned, for example socio-demographic variables. Other analyses performed included: psychological distress (assessed via the General Health Questionnaire-12), self-esteem, family cohesion, and whether the partner had a positive gambling screen score at Year 6. Intimate partner violence which was assessed at Year 6 was not assessed at Year 9 as data were not collected on that variable at the latter time point.

3.3 Children: Descriptive statistics

This Section presents data for children including demographics, gambling participation, and with whom the gambling took place.

3.3.1 Demographic data

Socio-demographic characteristics of the children are presented in Table 17. There was an equal distribution of boys and girls, with almost half (45%) being of Samoan ethnicity; just under one quarter (22%) were Tongan, 18% Cook Island, five percent were Niuean and the remainder were of other Pacific ethnicity. Only 3.6% of the children were not in good (or better) health (1.9% fair/ok, 1.7% poor). One fifth (21%) of the children had never experienced a significant life event¹⁰, whilst the remainder had experienced at least one life event in their nine years of life. The educational status of the children's mothers was fairly even with 36% having no formal qualification, 35% qualified to secondary school level and 29% having a post-school qualification.

	Ν	(%)
Gender		
Female	490	(49.2)
Male	506	(50.8)
Ethnicity		
Samoan	451	(45.3)
Cook Island	176	(17.7)
Niuean	47	(4.7)
Tongan	221	(22.2)
Other Pacific#	101	(10.1)
Highest educational qualification of mother		
No formal qualification	359	(36.0)
Secondary school qualification	346	(34.7)
Post-school qualification	291	(29.2)
General health		
Poor	17	(1.7)
Fair/OK	19	(1.9)
Good	155	(15.6)
Very good	507	(51.1)
Excellent	295	(29.7)
Number significant life events in past 12 months	205	
None	205	(20.6)
One	251	(25.2)
Two	196	(19.7)
Three or more	344	(34.5)

Table 17: Children	- Socio-demo	graphic chara	acteristics
--------------------	--------------	---------------	-------------

N = 996

Numbers (and percentages) do not always total 996 (or 100%) due to missing values # Includes children identifying equally with two or more Pacific groups, or with Pacific groups other than Tongan, Samoan or Cook Island

¹⁰ Significant life events as reported by the mother. They include major changes such as: moving house, changing job, death of family member or close relative, serious illness in the family and unemployment.

3.3.2 Gambling participation

Almost all of the children respondents¹¹ (96%, n=834) reported participating in card games; 60% (n=522) reported Housie/Bingo participation, 17% (n=146) had received scratch cards as a present, and seven percent (n=61) reported buying Lotto, Big Wednesday and/or Keno tickets. Most of the children did not play for money (87% of children for card games and 49% of children for Housie/bingo) (Figure 6). Boys were significantly more likely to play for money than girls (p=0.024) whilst girls were significantly more likely to prefer Housie/bingo than boys (p=0.012).



Figure 6: Children - Gambling participation

Twenty-seven percent (n=234) of children respondents reported having bet money with friends or family. As examples of where money might be bet, interviewers mentioned "on a game or marbles or a board game or card game, or on a sports match, or when playing dice?"). Of the children who had bet with money, just over half (55%) had bet with family, one-fifth (20%) with friends, and one-quarter (25%) had bet money with both family and friends (Figure 7).

Figure 7: Children - With whom they bet money



As Housie/bingo is a popular form of gambling amongst Pacific peoples, the children were also specifically asked with whom they had played Housie/bingo (either for money or not).

¹¹ A substantial proportion of children did not respond to the gambling questions. The reason for the high non-response rate is not known.

Pacific Islands Families Study 2009. Provider No: 467589, Agreement No: 327774/00 Gambling and Addictions Research Centre, Auckland University of Technology Final Report, re-issued 29 May 2012

Of the children who reported playing Housie/bingo, about one-third each reported this was with family (36%), friends (33%) or both family and friends (31%) (Figure 8).



Figure 8: Children - With whom they played Housie

However, the profiles were noticeably different when playing Housie/bingo was considered by playing for money or not for money, and by gender. When playing Housie/bingo for money, a greater percentage of boys and girls played more with family (54% boys, 62% girls) than when playing Housie/bingo not for money (28% boys, 34% girls). Conversely, a substantially lower percentage played with friends when playing for money (19% boys, 7% girls) than when not playing for money (31% boys, 42% girls) (Figure 9 and Figure 10).





Figure 10: Children - With whom they played Housie not for money



Pacific Islands Families Study 2009. Provider No: 467589, Agreement No: 327774/00 Gambling and Addictions Research Centre, Auckland University of Technology Final Report, re-issued 29 May 2012

3.4 Children: Association statistics

This Section presents data pertaining to the children, of associations between gambling participation (whether for money or not) and demographic data including specific variables pertaining to mothers and households. Associations between children's gambling, negative behaviours, cognitive ability and parental monitoring were also examined.

3.4.1 Demographic factors

Table 18 details univariate odds ratios of children's gambling and associations with gender and ethnicity. Associations between children's gambling and mothers' gambling, highest educational level and social marital status as well as between children's gambling and weekly household income and household size are presented.

Statistical significance was only attained between children's gambling participation and ethnicity, with children of Other Pacific ethnicity having lower odds (0.59 times) for gambling than Samoan children. However, as overall the ethnicity variable was not significant (p=0.12) this finding is likely to be spurious. No other associations were found relating to children's gambling and variables examined.

Variable	Category	0	Gambled			Univariate odds ratio		
		Yes	(%)	No	(%)	OR	(95% CI)	
Gender	Female	152	(35)	282	(65)	1.00		
	Male	172	(40)	260	(60)	1.23	(0.93, 1.62)	
Ethnicity	Samoan	160	(41)	234	(59)	1.00		
	Cook Island	51	(34)	101	(66)	0.74	(0.50, 1.09)	
	Niuean	20	(47)	23	(53)	1.27	(0.68, 2.39)	
	Tongan	69	(36)	124	(64)	0.81	(0.57, 1.16)	
	Other Pacific [#]	24	(29)	60	(71)	0.59	(0.35, 0.98)*	
Mother's marital	Partnered	238	(37)	410	(63)	1.00		
status	Non-partnered	83	(39)	130	(61)	1.10	(0.80, 1.51)	
Mother's educational status	None/secondary school qual.	207	(39)	318	(61)	1.00		
	Post school qual.	116	(34)	224	(66)	0.80	(0.60, 1.06)	
Mother gambles	No	165	(38)	267	(62)	1.00		
0	Lotto/Keno only	107	(38)	178	(62)	0.97	(0.71, 1.32)	
	Continuous forms	52	(35)	97	(65)	0.87	(0.59, 1.28)	
Weekly	\$0 - \$500	40	(37)	68	(63)	1.00		
household income	\$501 - \$1,000	92	(38)	148	(62)	1.06	(0.66, 1.69)	
	>\$1,000	57	(32)	120	(68)	0.81	(0.49, 1.33)	
	Unknown	135	(40)	206	(60)	1.11	(0.71, 1.74	
Household size	2 - 4 people	52	(37)	87	(63)	1.00		
	5 - 7 people	168	(35)	310	(65)	0.91	(0.61, 1.34)	
	8 or more people	104	(42)	144	(58)	1.21	(0.79, 1.85)	

Table 18: Children - Numbers, percentages and univariate odds ratios for gambling

Numbers will vary due to missing data for some variables

* *P* < 0.05

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

3.4.2 Behaviour and cognitive ability

Table 19 details univariate odds ratios of children's gambling and associations with negative behaviour and cognitive ability.

Of the negative behaviours assessed, children's involvement in a gang was statistically significantly associated with gambling participation at more than twice as great odds (2.19 times) per unit increase in gang involvement.

Cognitive ability was assessed using the Weschler Intelligence Score for Children (Weschler, 2003). Similarities¹² was statistically significantly associated with lower odds for gambling, at 0.93 times per unit increase. Block design¹³ was also statistically significantly associated with gambling participation; however as the odds ratio was only 1.02 this finding is likely to be spurious.

Additionally, the association between children's gambling and delinquency (dichotomised Yes/No response as opposed to per unit increase detailed in Table 19), and children's gambling and violent behaviour were examined. In the univariate analyses, both were associated with slightly increased odds for gambling (1.66 times for delinquency and 1.69 times for violent behaviour). However, as these associations were not present in the multivariate analyses, which adjust for confounding variables, they are likely to be of no importance.

	Variable score		riate odds ratio
		OR	(95% CI)
Negative behaviour	Bullying perpetrator (per unit increase)	1.12	(0.99, 1.27)
	Bullying victim (per unit increase)	1.02	(0.95, 1.09)
	Delinquency (per unit increase)	0.95	(0.59, 1.52)
	Gang involvement (per unit increase)	2.18	(1.20, 3.96)*
	Substance misuse (per unit increase)	1.57	(0.83, 2.99
Cognitive ability	Block design (per unit increase)	1.02	(1.00, 1.04)*
(WISC-IV score)	Similarities (per unit increase)	0.93	(0.89, 0.97)***
	Matrix reasoning (per unit increase)	1.00	(0.96, 1.04)
	Vocabulary (per unit increase)	1.02	(0.98, 1.06)

 Table 19: Children - Univariate odds ratios of gambling and behaviour and cognitive ability

*P < 0.05, ***P < 0.001

In the multivariate logistic regression analyses, gang involvement (per unit increase) and cognitive ability in similarities (per unit increase) retained their statistically significant associations with gambling (Table 20).

¹² Similarities relates to the child's cognitive ability at recognising how two words are alike/similar.

¹³ Block design relates to a child's ability to put blocks in a pattern according to a displayed model.

Variable score	Adjusted odds ratio	
	OR	(95% CI)
Gang involvement (per unit increase)	2.55	(1.49, 4.34)***
Similarities (per unit increase)	0.95	(0.92, 0.97)***
	Variable score Gang involvement (per unit increase) Similarities (per unit increase)	Variable scoreAdj ORGang involvement (per unit increase)2.55Similarities (per unit increase)0.95

Table 20: Children - Adjusted odds ratios of gambling and behaviour and cognitive ability

3.4.3 Parental monitoring

Table 19 details univariate odds ratios of children's gambling and the association with parental monitoring. There was a statistically significant association, with gambling participation at 1.34 times greater odds per unit decrease in parental monitoring.

Table 21: Children - Univariate odds ratios of	gambling and	parental monitoring
--	--------------	---------------------

	Variable score	Univ: OR	ariate odds ratio (95% CI)
Parental monitoring	Per unit decrease	1.34	(1.05, 1.71)*
* <i>P</i> < 0.05			

In the multivariate logistic regression analyses, lower parental monitoring (per unit decrease) retained its statistically significant association with gambling (Table 22).

|--|

	Variable score	Adjusted odds ratio	
		OR	(95% CI)
Parental monitoring	Per unit decrease	1.50	(1.20, 1.88)***
*** $P < 0.001$			

3.4.4 Analyses with non-significant associations

Several further association analyses were performed where no level of statistical significance was attained and thus no association between the variable and children's gambling was identified. In the interests of readability of this report, these null result data have not been presented. Some of these have been previously mentioned, for example delinquency and violent behaviour. Other analyses performed included number of significant life events experienced (as reported by the mother), teachers' evaluation of child's school performance, number of doctor's (General Practitioners) visits the child had in the past 12-months (analysed by mother as gambler and by mothers' PGSI classification), mother's assessment of child's general health (analysed by mother as gambler and by mother's PGSI classification), children's self perception, substance use, and mother's PGSI classification.

4. **DISCUSSION**

The purpose of this study was to enhance and add value to the existing longitudinal Pacific Islands Families study by incorporating a substantial gambling component in the Year 9 data collection phase. The primary objectives were to collect in-depth gambling-related data from mothers and children, and to build on previous data gathered from mothers at the Year 6 data collection phase. The two main aims were:

- Assess for possible predictors (risk factors) and protective factors for gambling
- Investigate associations between child gambling behaviours and social, familial, environmental and individual factors

Additionally, it was anticipated the analyses would:

- Identify any trends in participating in gambling by Pacific mothers
- Assess the incidence of problem gambling among Pacific mothers
- Assess gambling by Pacific children
- Assess any relationship between gambling and other health issues
- Assess the relationship between gambling and quality of standard of life for children (i.e. nutrition) and the mother
- Assess any relationship between gambling status and economic standard of life (i.e. access to transport or telephone)
- Compare against key findings from the PIF 2006 report (i.e. children's behaviour, interpersonal violence)

Results from the analyses of gambling questions and related associations (separately for mothers and children) are presented in Chapter 3 of this report. In this Chapter, the key findings are drawn together and their importance discussed.

4.1 Gambling activity

Mothers' gambling activity

The total percentage of mothers participating in gambling activities in the past year increased from 363 (36%) in Year 6 to 479 (50%) in Year 9. As 90 mothers who gambled at Year 6 no longer gambled in Year 9 whilst 199 non-gamblers in Year 6 gambled in Year 9, this not only indicates an increase in gambling prevalence but a slight increase in incidence too.

Mothers who had gambled in Year 6 had 4.4 times greater odds for gambling in Year 9 than those who had not gambled in Year 6. It could be that participation in gambling (in Year 6) led to familiarity with the activity which in turn could have led to increased cognitive accessibility of gambling resulting in increased enjoyment, and thus continuation of the activity in Year 9 (Hing & Haw, 2009; Myers, 1993).

When analyses were performed by continuous (all forms except Lotto and Keno) and noncontinuous forms of gambling (Lotto and Keno only), gambling in Year 6 (on either noncontinuous or continuous forms) was associated with higher odds for gambling on continuous forms in Year 9, compared with not gambling in Year 6. Additionally, analyses indicated that gambling in Year 6 on continuous forms was associated with lower odds for gambling on non-continuous forms in Year 9, compared with gambling on non-continuous forms in Year 6. Thus, these findings indicate that *any* gambling in Year 6 was more likely to lead to riskier (continuous forms) gambling in Year 9, and that mothers who participated in riskier gambling in Year 6 were less likely to revert to low risk (non-continuous forms) gambling in Year 9. Gambling participation at 50% in Year 9 is the same as the participation rate noted for Pacific peoples (50%) in a study assessing the social impacts of gambling in New Zealand (SHORE, 2008). It is also similar to the participation rate noted for Pacific peoples in the 2006/7 New Zealand Health Survey, which reported past-year gambling at 55%, compared with 65% for the general population (Ministry of Health, 2009). However, in the 2010 Health and Lifestyles Survey, 70% of Pacific peoples reported past-year gambling participation in at least one gambling activity, compared with 81% for the general population (Gray, 2011).

In Year 6, gambling participation was relatively low at 36% with the reason being unclear though possibly related to the presence of young children in the household. It was surmised in Year 6 that participation rates might increase as the children aged (Bellringer et al., 2008) and this hypothesis appears to have been correct given the increase to 50% participation three years later, in Year 9.

Of the mothers who had gambled during the previous 12 months, Lotto was the form of gambling most participated at both phases (89% Year 6, 92% Year 9) with much lower levels of participation in other forms of gambling (15% or less). Internet and horse/dog race gambling were both noted in Year 9 (1% or less) and had not been noted in Year 6; these mothers had taken up these forms of gambling since Year 6.

In Year 9, frequency of gambling was more likely to be weekly for Lotto, Instant Kiwi and Housie/bingo, and monthly or less than monthly for casino and pub electronic gaming machines. Keno was the only form of gambling where frequency of participation was reported to be daily or almost daily by some respondents (3.7%) but with a majority reporting weekly participation. For the other forms of gambling, sample sizes were too small to allow meaningful analysis. Gambling frequency was not assessed in Year 6, so no comparisons between the years could be made.

Comparisons between Year 6 and Year 9 expenditure on gambling are highly suspect due to the different methods of data reporting (weekly in Year 6, monthly in Year 9), with Year 6 data likely to be substantially over-estimated when compared to Year 9. Additionally, self-reported expenditure on gambling is notoriously hard to capture reliably (Volberg, Gerstein, Christiansen, & Baldridge, 2001). Therefore, only Year 9 data are discussed in this report. Median expenditure on gambling was \$20/month. If the median monthly expenditure is multiplied by 12 this creates a median annual expenditure of \$240 which is less than that reported in the 2005 participation and attitudes to gambling survey of \$455 for Pacific peoples (Department of Internal Affairs, 2008). This difference may be due to several reasons, such as gender differences (only mothers are investigated in the current study), due to reporting bias in recollecting amounts spent over a past-month time frame, or because data from mothers as opposed to Pacific females in general are presented.

However, median monthly expenditure for the mothers varied for different forms of gambling. The highest expenditures were on gambling forms participated in by a minority of mothers who had gambled in the past 12 months; \$40/month for casino electronic gaming machine gambling participated by nine percent and \$30/month for Housie/bingo participated by 14%. Conversely, a lower median monthly expenditure of \$15 was reported for Lotto participated in by 92% of mothers who had gambled. This shows a positive skew to the data whereby there is a relatively high median expenditure correlated with low participation forms of gambling and vice versa, and indicates 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. This finding was also noted in Year 6.

Children's gambling activity

Although the children were only nine years of age, almost all respondents (96%, n=834) reported having played card games with family or friends and 60% reported having participated in Housie/bingo. However, the majority had not played for money. Housie/bingo participation by the children was relatively equally split between playing with family (36%), friends (33%) or both family and friends (31%). However, when playing Housie/bingo for money, a greater percentage of boys and girls played more with family (54% boys, 62% girls) than when playing Housie/bingo not for money (28% boys, 34% girls). Conversely, a substantially lower percentage played with friends when playing for money (19% boys, 7% girls) than when not playing for money (31% boys, 42% girls). Children were not asked with whom they played card games.

It is not surprising that card game participation was the most popular form for the children. Card games are socially and physically accessible to most people and playing card games at home is possible almost any time of the day. These factors provide numerous opportunities for card game playing. Housie/bingo is a common form of fundraising within Pacific churches (Perese, Bellringer, Williams, & Abbott, 2009) (and thus culture) so it is not surprising that a majority of children had participated in Housie/bingo. Housie/bingo playing has also been associated with better self-ratings in regard to feelings about self in adults (SHORE, 2008). The overall participation of Housie/bingo with family (36%) or family and friends (31%) indicates that the children are socialising with their family members, whose attitudes and behaviours could play an important role in the child's development. This will be observable if further gambling-related data are collected from the children at future time points in this prospective study.

It is of note that 17% of children had received scratch cards as a gift. Given that the minimum age for playing scratch cards is 18 years, this indicates that a substantial minority of parents/family members are unaware of the legal regulations/restrictions. It is interesting that seven percent of children also reported buying Lotto/Big Wednesday/Keno tickets as this moves into the realm of gambling for money.

Twenty-seven percent of the children respondents reported having bet money with friends or family with just over half of those betting for money only with family (55%), one-fifth (20%) only with friends and one-quarter (25%) with both family and friends. Unlike other problem behaviours, parents are often involved in children's gambling (Delfabbro & Thrupp, 2003; Felsher, Derevensky, & Gupta, 2003; Wickwire, Whelan, Meyers, & Murray, 2007), which in turn delivers a message to children that gambling is an acceptable and harmless behaviour, and induces positive attitudes towards gambling (Vachon, Vitaro, Wanner, & Tremblay, 2004). When gambling is perceived as an acceptable behaviour, children are more likely to engage in gambling activities (Langhinrichsen-Rohling, 2004; Vachon, et al., 2004).

Boys were noted to be significantly more likely to gamble for money than girls, and girls were significantly more likely to prefer Housie/bingo than boys. This finding is similar to that noted internationally in that boys are generally more likely to engage in gambling than girls (Delfabbro, Lahn, & Grabosky, 2005; Govoni, Rupcich, & Frisch, 1996; Jacobs, 2000; Wickwire et al., 2007). Boys have also been reported to participate in a greater variety of game types (Delfabbro, et al., 2005; Jacobs, 2000) and prefer skill/strategy based games such as card, board, and sport betting games, while chance-related games such as raffles and bingo are preferred by girls (Delfabbro, et al., 2005; Delfabbro & Thrupp, 2003; Stinchfield, 2001).

4.2 Gambling associations

Mothers' gambling associations

There were no important ethnic differences noted in relation to mothers' gambling in Year 9. This was at variance to Year 6 where Tongan mothers had lower odds for gambling (by half) in comparison with Samoan mothers. Cultural differences were noted at Year 6; however, cultural orientation data were not collected in Year 9 precluding comparison between the phases.

Whilst analyses of associations between gambling and total household income are complicated because factors such as disposable income and high refusal rate to answer the question need to be taken into account, analyses of changes in financial status versus gambling can be more meaningful. In this study, mothers whose financial situation had worsened (total household income decreased) from Year 6 to Year 9 had twice as great odds for gambling in Year 9 as mothers whose financial situation had remained stable over that period. However, the causal relationship between reduced financial situation and gambling is not known at this stage.

A change in marital status from partnered to separated from Year 6 to Year 9 was associated with statistically significant lower odds for gambling, with separated mothers having less than half the odds for gambling (0.43 times) as mothers whose marital status had stayed the same. The causal factors for this change are not known. Whilst a similar finding was noted for the association between separation from Year 6 to Year 9 and participation in non-continuous forms of gambling, this association was not maintained when confounding variables were controlled for. However, the finding of lower odds for participating in non-continuous forms of gambling and being non-partnered at Year 9 (irrelevant of partner status at Year 6) did retain its association after controlling for confounders (0.62 times). Additionally, although univariate analyses indicated that mothers had greater odds for gambling in Year 9 if their partner had gambled in Year 6, the association was not retained when controlling for confounding factors. One confounding factor could be that the change in marital status was only recorded if mothers had been partnered in Year 6 and separated in Year 9; the questionnaire was not sensitive enough to determine if mothers separated and then repartnered in that three-year period; they were reported in the 'stable' category as they were partnered at both time points. It is not possible to say, therefore, that mothers who separated from partners who were gamblers were then less likely to gamble.

A mild level of socio-economic deprivation (score one or two characteristics on NZiDep) was statistically significantly associated with gambling on continuous forms at 1.74 times greater odds compared with mothers who reported no deprivation characteristics. Thus, there is a negative relationship between standard/quality of life and gambling on continuous forms. The NZiDep measures deprivation with reference to economising behaviours (choosing lower quality consumables to save money) and deprivation indicators (accepting help from governmental and charitable organisations) (Salmond., et al, 2006).

Gambling was also significantly associated with increased smoking and increased frequency of alcohol consumption from Year 6 to Year 9 compared with mothers whose smoking or alcohol consumption had remained stable. In the analyses for associations with continuous forms of gambling, increasing and decreasing smoking frequency from Year 6 to Year 9 were associated; these findings were not retained when confounding variables were controlled for. Being a smoker in Year 9 was also associated with gambling on continuous forms. These findings indicate that being a smoker in Year 9 (rather than increasing or decreasing smoking over time) is most associated with gambling on continuous forms. A similar finding in relation to smoking and gambling was also noted in Year 6. Experiencing at least one significant life event in the previous 12 months was strongly associated with gambling expenditure in the upper quartile (\geq \$40/month), with odds of four to five times greater (dependent on number of life events experienced). Mothers were asked if they had experienced any of 23 different important life events in the past 12 months which included major changes such as: moving house, changing job, death of family member or close relative, serious illness in the family and unemployment. Each of these life events would cause substantial stress. International research has indicated that when unable to cope with stressful situations, some people gamble as an escape mechanism (Ledgerwood & Ptery, 2006; Nower, Gupta, & Derevensky, 2000). This is potentially the case in this study with mothers gambling more (higher expenditure) to combat the stressful situations experienced. Life events experienced was not associated with gambling in general or gambling on continuous or non-continuous forms, when other factors were controlled for, i.e. mothers did not appear to gamble per se because of life events experienced. However, caution is advised in the interpretation of this finding due to the very small sample (n=6) of mothers who had not experienced any significant life events but had gambling expenditure in the upper quartile.

No associations were noted between mothers' gambling and psychological distress, selfesteem, family cohesion, or whether the partner had a positive gambling screen score at Year 6.

Children's gambling associations

No statistically significant associations were noted between children's gambling and the demographic variables examined.

Being involved in a gang was statistically significantly associated with higher odds of gambling participation, even when confounding variables were controlled for. A gang was described to the children as "any street club that carries a name, wears particular colours etc" and thus is not necessarily associated with negativity and criminal activity as is perceived when adult gang membership is considered. Whilst there is a lack of research around child gambling and gang involvement, Wynne and colleagues (1996) reported that gambling is often participated in by groups of adolescents who will likely be involved in other risk behaviours. In the present study, other negative behaviours such as bullying, delinquency and substance misuse were not associated with gambling. However, it will be interesting to see how these results change over time.

Cognitive ability was assessed in the children using the Weschler Intelligence Score for Children (Weschler, 2003). This test of cognitive ability comprises several subtests. One of the subtests, similarities, measures a child's cognitive ability at recognising how two words are alike/similar. In the current study, increase in similarities score was associated with slightly lower odds of participating in gambling, which could possibly indicate that those with a higher cognitive ability are less likely to gamble. Again, it will be interesting to see how these results change over time using the Year 9 results as a baseline for future longitudinal analyses.

Parental monitoring refers to parental knowledge about their child's life and development in and outside the home and keeping track of the child's behaviours in these environments (Dishion & McMahon, 1998). In the current study, less parental monitoring was associated with increased odds for children's gambling, even when confounding variables were controlled for. According to self-control theory (also known as general theory of crime), inadequate parental monitoring and ineffectual parental strategies result in low self-control in children (Gottfredson & Hirschi, 1990). Individuals with a low level of self-control are more likely to be impulsive, prefer immediate rewards with little effort, be more involved in risktaking behaviours, and be more self-orientated. Conversely, good parental monitoring and parent-child bonding are associated with a high level of self-control and buffer negative peer influence, reducing the likelihood of delinquent behaviours (Cullen, Unnever, Wright, & Beaver, 2008; Flexon, Greenleaf, & Lurigio, 2010). Parents frequently engaged in gambling are less committed to parental monitoring, and children from families with a low level of parental monitoring tend to have a higher frequency of gambling and are at a higher risk for developing problem gambling (Gupta & Derevensky, 1997; Langhinrichsen-Rohling, 2004; Vachon, et al., 2004).

International research has indicated associations between parental and children's gambling, with children more likely to take part in gambling activities if their parents gamble (Hardoon & Derevensky, 2002; Jacobs, et al., 1989; Kearney & Drabman, 1992; Lesieur, et al., 1991; Magoon & Ingersoll, 2006; Oei & Raylu, 2004). However, this finding was not noted in the current study with no association between mother's gambling and children's gambling. This may, in part, be due to the young age of the children in the current study and will be interesting to examine over time.

No associations were noted between mothers' gambling or PGSI classification and the children's general health or number of visits made to the doctor (General Practitioner) in the past 12 months. If these health measures are used as a proxy for quality of standard of life for the children (assuming that if quality or standard of life is low, that negative health impacts will ensue), in the Year 9 phase, the children's quality of standard of life was not affected by whether the mothers gambled or were classified as moderate risk or problem gamblers.

No associations were noted between children's gambling and number of significant life events experienced in the past 12-months, child's school performance, child's self-perception or substance use.

In a review of child and adolescent gambling behaviour, Hardoon and Derevensky (2002) detailed that adult problem gamblers report that their problem behaviours started between the ages of 10 and 19 years of age. They conclude that "For many youth, gambling is considered to be the new "rite of passage" into adulthood". When children are involved in gambling, social and other activities are replaced; which may have negative impacts on relationships and friends and family, and lead to disruption in academic performance (Derevensky, 1999; Gupta & Derevensky, 1998). As children gain knowledge and develop gambling habits, they are more likely to become problem gamblers in early adulthood (Denton & Kampfe, 1994; Gupta & Derevensky, 1998; Vitaro, Wanner, Ladouceur, Brendgen, & Tremblay, 2004; Volberg, 1994; Winters, Stinchfield, Botzet, & Anderson, 2002), and this may lead to cognitive, psychiatric, social, and substance abuse problems in the future (Burge, Pietrzak, Molina, & Petry, 2004; Burge, Pietrzak, & Petry, 2006). This prospective study will allow for such developments to be followed over time as the children mature through adolescence and into adulthood.

4.3 Problem gambling screens

Problem Gambling Severity Index

Using the PGSI, the majority of mothers who had gambled in the past 12 months in Year 6 and Year 9 were classified as current (past 12-month) non-problem gamblers (84% and 90% respectively), with 12%/5% classified as low risk gamblers, three percent in both years classified as moderate risk gamblers, and one percent in both years classified as problem gamblers. This finding is similar to that reported in the 2006/7 New Zealand Health survey which identified that 1.6% of Pacific females were classified as problem gamblers and 2.6% were classified as moderate risk gamblers (Ministry of Health, 2009).

One hundred and seventy-three mothers who had not gambled in the past 12-months in Year 6 became gamblers in Year 9, with nine each being classified as low risk or moderate risk gamblers and one being classified as a problem gambler. Conversely, 75 mothers who had gambled in the previous 12-months in Year 6 were non-gamblers in Year 9; this included mothers who had been classified as low risk gamblers (n=11), moderate risk gamblers (n=2) and a problem gambler (n=1). These numbers differ slightly from those detailed in the "Mothers' gambling activity" section of this report and discussed on page 44¹⁴ as the 'gambling activity' data were a cross-sectional assessment of participants (all mothers who responded to the gambling question in Year 6 and all mothers who responded to the gambling questions in both Year 6 and Year 9 are presented. Notwithstanding, this indicates an increase in gambling prevalence and a slight increase in incidence, as previously mentioned on page 44.

Seventy-nine percent (n=120) of the mothers who had gambled in the previous 12-months in both Year 6 and Year 9 maintained the same gambling classification across the time points. Of note, however, is that almost all (n=118) were in the non-problem gambler category, with one mother remaining a low risk gambler and another mother remaining a moderate risk gambler at both time points. This finding is similar to that noted in the Victorian (longitudinal) Gambling Study where 88% of non-problem gamblers in Wave One remained non-problem gamblers in Wave Two conducted a year later (Department of Justice, 2011). The remaining mothers in the current study changed PGSI classification. Seven percent (n=10) became low risk/moderate risk/problem gamblers from being prior non-problem gamblers, and 14% changed to a lower classification (low risk to non-problem gambler n=14, moderate risk to non-problem/low risk n=4, problem gambler to non-problem gambler n=3). Again, this is similar to findings in the Victorian Gambling Study where six percent of gamblers increased PGSI classification and four percent decreased PGSI classification from Wave One to Wave Two (Department of Justice, 2011). This finding shows that problematic gambling exists on a continuum with some people moving into and out of problem gambling over time.

Of particular interest is that one Year 6 non-gambler was classified as a problem gambler in Year 9 and one problem gambler in Year 6 was a non-gambler in Year 9. Similarly, 18 Year 6 non-gamblers were classified with some level of risk in Year 9 (nine each at low risk and moderate risk) whilst 13 at-risk gamblers in Year 6 (11 low risk, two moderate risk) were non-gamblers in Year 9. These findings support the notion that problem gambling exists on a continuum with movement along the continuum possible in both directions (increasing and decreasing severity).

Also of interest is that no mothers who were classified as low/moderate risk gamblers in Year 6 moved into a higher risk classification in Year 9, and all Year 6 problem gamblers were classified as non-problem gamblers/non-gamblers three years later. This indicates that all movement along the continuum for mothers who had some level of risk classification was towards reduced risk or problems, although as the sample sizes were small the findings must be treated with caution. Nevertheless, this finding questions the validity of the risk classification being a predictor of future gambling problems amongst Pacific peoples and highlights the need to identify other factors that predict the risk of developing problem gambling over a period of time. This may be possible if longitudinal analyses investigating movement along the gambling continuum continues in future phases of this prospective study. It is unfortunate that no help-seeking questions were included in the questionnaire for this study; these could have indicated if the reduction in risk/problem gambling status was due to

¹⁴ 199 vs.173 Year 6 non-gamblers became gamblers in Year 9, and 90 vs. 75 Year 6 gamblers became non-gamblers in Year 9.

Pacific Islands Families Study 2009. Provider No: 467589, Agreement No: 327774/00 Gambling and Addictions Research Centre, Auckland University of Technology Final Report, re-issued 29 May 2012

natural recovery or some other type of formal or informal assistance. The aforementioned Victorian Gambling Study reported different findings from their two data collection waves with the majority of problem gamblers in Wave One remaining so at Wave Two (Department of Justice, 2011). The differences between the Victorian study and the current study could be due to numerous factors such as the Victorian Study being a general population study (rather than a Pacific family-specific study) or due to the different sample sizes, 45 problem gamblers in Wave Two of the Victorian Study versus three problem gamblers in Year 9 of the current study.

No association between ethnicity and PGSI classification was noted in Year 9 which was at variance with Year 6 when Tongan mothers had 2.4 times greater odds of being in PGSI classified at risk/problem gambler groups than Samoans.

However, a statistically significant association was noted between at risk/problem gambler categorisation and smoking (2.74 times greater odds). This finding was not noted at Year 6. Previous research has documented a correlation between smoking and problem gambling (for example see Abbott, 2001b; Crockford & el-Guebaly, 1998; Grant et al., 2002; Griffiths et al., 2002; MacCallum & Blaszczynski, 2002; Ministry of Health, 2009; Potenza et al., 2002).

Lie-Bet tool

There was a very poor correlation between responses to the Lie-Bet questions in Year 6 and Year 9, which would not be expected. As detailed in Results Section 3.1.7 this may have been due to the different way the tool questions were asked at both time points. The actual Lie-Bet tool was used only at Year 9. The discrepancy between responses across the two years may also have been because the mothers did not respond to the questions as life time questions in Year 9 (when they were actually asked as life time questions), perhaps responding to them as questions with a finite (recent) time frame. There are very few published studies investigating the test-retest reliability of lifetime questions in gambling screens and generally they have involved short time intervals, such as the recent study by Fortune & Goodie (2010) who administered the Modified Diagnostic Interview for Gambling Severity (DIGS) and the South Oaks Gambling Screen (SOGS) to college students on three occasions in two months. Whilst good test-retest reliability was noted for SOGS, the results were not so clear for DIGS. Unfortunately, as Fortune & Goodie (2010) indicate, to date there is no similar longitudinal study involving longer test-retest intervals.

However, results from Year 9 indicated correlation between the lying and betting questions and the PGSI. Almost all mothers (9/10) who reported that they had ever lied to hide their gambling fell within the at risk/problem gambler PGSI dichotomised classification. Thirteen of 18 mothers who reported ever betting/spending more money than intended on gambling also fell within the at risk/problem gambler PGSI dichotomised classification. One of the PGSI classified non-problem gamblers responded positively to the question about ever lying, and five PGSI classified non-problem gamblers responding positively to the question about ever lying, and five PGSI classified non-problem gamblers responding positively to the question about ever betting or spending more money than intended. The Lie-Bet tool was designed to identify gamblers who had *ever* had a *severe* level of problem gambling (i.e. in a life time) so it is important to note that the correlations between the lying and betting questions with the PGSI were performed using dichotomised variables for the PGSI. This was necessary due to the very small sample sizes but meant that low risk gamblers were included in the variable with moderate risk and problem gamblers; additionally the PGSI is administered in a 12-month time frame whereas the Lie-Bet is a life time screen and these factors could account for some of the discrepancies.

4.4 Problems due to someone else's gambling

Fewer mothers reported having problems due to someone else's gambling in Year 9 (2.6%) compared with Year 6 (4.1%). The reason for the decrease in affected mothers is not known at this stage and could be an artefact of the small numbers involved (n=25, n=41 respectively). Nine mothers reported that the relationships were with spouse or partner, closely followed by sibling (n=8) and parent (n=6). Other relationships reported included uncle/aunt or extended family. This shows that a majority of the relationships were with close, immediate family members, those comprising the archetypical nuclear family, and could indicate that problem gambling has its biggest negative impacts on people closest to the gambler. The negative impacts included worrying about the other person's gambling (n=23)and financial impacts, with 14 mothers reporting that the effect of the other person's gambling was that they (the mothers) were paying for it financially. Six of the mothers reported being concerned about their safety as a consequence of the other person's gambling. Although not measured at the Year 9 time point, in Year 6, fathers who were categorised as at risk/problem gamblers by the PGSI had three times higher odds for perpetrating physical violence than non-problem gamblers, and fathers who gambled had greater odds for being verbally aggressive than non-gamblers (Bellringer et al., 2008).

4.5 Conclusion

This study has added a second cross-sectional time point to the longitudinal Pacific Islands Families Study (Year 9 versus Year 6 previously reported) which has built on knowledge of mothers' gambling and allowed for some population level longitudinal analyses to be performed over a three-year time period from Year 6 to Year 9. Importantly, it has also allowed for gambling in Pacific children at nine years of age to be examined within a familial context. This is the first research of that nature and sets a baseline from which to explore the links between parental gambling and child development of gambling behaviours, as well as risk and protective factors for problem gambling amongst the children as they progress through adolescence and into adulthood. In conclusion, this study has identified the following key trends and findings.

Participation - mothers

Frequency of gambling in Year 9 (not measured in Year 6) for those mothers who reported gambling in the past 12 months was likely to be *weekly for lottery products* (Lotto, Instant Kiwi), Keno and Housie, and *monthly or less for electronic gaming machines*. A small minority (3.7%) of the mothers who had gambled on Keno in Year 9 reported *daily* participation.

Participation - children

Almost all the children reported participating in either card games or Housie/bingo, though the majority did not play for money (73%). Boys were more likely to play for money than girls who were more likely to prefer Housie/bingo than boys. When playing Housie/bingo for money, a greater percentage of boys and girls (over half) played more with family than when playing Housie/bingo not for money (one-third or less). Conversely, a substantially lower percentage played with friends when playing for money (19% boys, 7% girls) than when not playing for money (31% boys, 42% girls).

Almost one-fifth (17%) of children had received scratch cards as a gift and seven percent reported buying Lotto/Big Wednesday/Keno tickets.

Trends - mothers

There was an *increase in gambling prevalence and incidence* amongst mothers from Year 6 to Year 9, although on an individual level there was some movement into and out of gambling.

Changes in non-gambling and gambling status, and PGSI risk levels, of individual mothers from Year 6 to Year 9 occurred in both directions indicating that *problematic gambling exists on a continuum* with some people moving into and out of problem gambling over time. All movement along the continuum for mothers who had been classified as low risk/moderate risk/problem gambler in Year 6 was *towards reduced risk or problems* in Year 9. As sample sizes were small, this finding must be treated with caution.

Forms of gambling participation have remained similar across both time points with Lotto being the most popular, and other forms at a substantially lower level.

Expenditure patterns in Year 9 indicated *support for a bimodal distribution of gambling*, as had been shown previously in Year 6. The bimodal distribution was indicated by a positive skew to data where there was a relatively high median expenditure correlated with low participation forms of gambling, and vice versa.

Fewer mothers reported having *problems with someone else's gambling* in Year 9 (n=25) compared with Year 6 (n=41). The majority of relationships were with close, immediate family members (e.g. spouse/partner, sibling or parent). Key negative impacts included worrying about the other person's gambling, financial concerns and safety concerns.

Trends - children

No trends for children were identifiable as the current study was the first time gamblingrelated data have been collected. Trends may be identifiable at future data collection phases.

Potential risk factors - mothers

Gambling in Year 6 was associated with higher odds for gambling in Year 9 and could indicate that participation in gambling is a risk factor for continued gambling participation. Furthermore, it is likely that any gambling is a risk factor for subsequent gambling on continuous forms, which are known to have a higher risk for problem gambling development.

Worsening of financial situation (total household income decreased) from Year 6 to Year 9 was associated with gambling in Year 9. However, the causal relationship is unclear.

A mild level of socio-economic deprivation was associated with gambling on continuous forms in Year 9. The causal relationship is unknown.

Being a *smoker* was associated with gambling at both time points but again, the causal relationship is not known.

Experiencing at least one significant life event in the previous 12 months was strongly associated with gambling expenditure in the upper quartile (\geq \$40/month); however, this finding needs to be treated with caution due to small sample size of mothers experiencing no life events and with upper quartile gambling expenditure.

Potential risk factors - children

Being involved in a gang was associated with higher odds of gambling participation; however, the causal relationship is not known.

Lower parental monitoring was associated with higher odds of children's gambling participation. Other research has indicated that children from families with a low level of parental monitoring tend to have a higher frequency of gambling.

Potential protective factors - mothers

Change in marital status from partnered to separated from Year 6 to Year 9 was associated with lower odds for gambling. However, the causal relationship for this finding is unknown.

Potential protective factors - children

There was an indication that *increased cognitive ability* (similarities test) was associated with slightly lower odds of participating in gambling.

At the Year 9 phase of the current longitudinal study, there was no indication of any relationship between gambling and other health issues.

In summary, this report, detailing data collected from the Year 9 phase of the longitudinal Pacific Islands Families Study, and comparing it with data collected three years earlier (Year 6) has enabled some preliminary population level trends analyses to be conducted on the mothers and has allowed for some potential risk and protective factors to be identified. However, longer term implications of these findings cannot be concluded at this stage, in many cases because the samples sizes are very small, particularly in relation to at risk/ problem gambling or to gambling on forms other than Lotto. Whilst causal relationships remain unclear at this stage, further data collection phases may lead to clarification of these relationships. In particular, data collection around gambling participation amongst the children, and the association analyses have identified several areas of interest, and set the baseline for examination of the development of problem gambling in a familial context.

5. LIMITATIONS OF THIS STUDY

The population group comprises families recruited from one hospital in South Auckland. Thus, most of the participants live in the same area¹⁵ and are not necessarily representative of the New Zealand Pacific population as a whole.

The low numbers of at risk gamblers and problem gamblers within the cohort meant that for statistical analyses, PGSI classifications had to be dichotomised into two groups (non-problem gamblers versus low risk/moderate risk/problem gambler). This was not ideal in that direct associations between problem gamblers and socio-demographic variables/health outcomes could not be made.

No help-seeking behaviour questions have been included in the data collection phases. This would be a useful avenue to explore in future data collection phases given that there was movement of mothers with problem gambler and moderate risk classifications towards lower severity classifications over the three-year time frame reported.

The data have not been weighted so all findings refer to the study population and not the New Zealand Pacific population.

The findings refer only to associations and not causal relationships. Further data collection phases are required for rigorous trend analyses to be conducted.

When Year 9 data were compared with Year 6 data (apart from the PGSI comparisons), they were population level comparisons from two cross-sectional points in time. They were not a true longitudinal analysis, where only the same participants at both time points would be included in the analyses, and therefore, cannot be considered as such.

¹⁵ As this is a longitudinal study, some participants have moved over time, to other parts of New Zealand or to other countries.

6. **REFERENCES**

Abbott, M.W. (2001a). What do we know about gambling and problem gambling in New Zealand? Report Number Seven of the New Zealand Gaming Survey. Wellington, Department of Internal Affairs.

Abbott, M.W. (2001b). Problem and non-problem gamblers in New Zealand: A report on phase two of the 1999 National Prevalence Survey. Report Number Six of the New Zealand Gaming Survey. Wellington, Department of Internal Affairs.

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

Bellringer, M., Abbott, M., Williams, M., & Gao, W. (2008). *Pacific Islands Families Longitudinal Study. Final Report.* Auckland: Gambling and Addictions Research Centre, Auckland University of Technology.

Burge, A.N., Pietrzak, R.H., Molina, C.A., & Petry, N.M. (2004). Age of gambling initiation and severity of gambling and health problems among older adult problem gamblers. *Psychiatric Services*, *55*(12), 1437.

Burge, A.N., Pietrzak, R.H., & Petry, N.M. (2006). Pre/early adolescent onset of gambling and psychosocial problems in treatment-seeking pathological gamblers. *Journal of Gambling Studies*, 22(3), 263-274.

Crockford, D.N., & el-Guebaly, N. (1998). Psychiatric comorbidity in pathological gambling: A critical review. *Canadian Journal of Psychiatry*, 43, 43-50.

Cullen, F.T., Unnever, J.D., Wright, J.P., & Beaver, K.M. (2008). Parenting and self-control. In E. Goode (Ed.), *Out of control: Assessing the general theory of crime* (pp. 61-74). Standford, CA: Standford University Press.

Delfabbro, P., Lahn, J., & Grabosky, P. (2005). Further evidence concerning the prevalence of adolescent gambling and problem gambling in Australia: A study of the ACT. *International Gambling Studies*, *5*(2), 209-228.

Delfabbro, P., & Thrupp, L. (2003). The social determinants of youth gambling in South Australian adolescents. *Journal of Adolescence*, 26(3), 313-330.

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

Department of Justice. (2011). The Victorian Gambling Study: A longitudinal study of gambling and public health - Wave Two findings. Victoria: Department of Justice.

Derevensky, J. (1999). *Prevention of youth gambling problems: Treatment issues*. Paper presented at the meeting of the Canadian Foundation on Compulsive Gambling annual conference, Ottawa.

Dishion, T.J., & McMahon, R.J. (1998). Parental monitoring and the prevention of child and adolescent problem behavior: A conceptual and empirical formulation. *Clinical Child and Family Psychology Review*, 1(1), 61-75.

Felsher, J.R., Derevensky, J.L., & Gupta, R. (2003). Parental influences and social modelling of youth lottery participation. *Journal of Community & Applied Social Psychology*, *13*(5), 361-377.

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

Flexon, J.L., Greenleaf, R.G., & Lurigio, A.J. (2010). The effects of self-control, gang membership, and parental attachment/identification on police contacts among Latino and African American youths. *International Journal of Offender Therapy and Comparative Criminology*.

Fortune, E.E., & Goodie, A.S. (2010). Comparing the utility of a Modified Diagnostic Interview for Gambling Severity (DIGS) with the South Oaks Gambling Screen (SOGS) as a research screen in college students. *Journal of Gambling Studies*, *26*(4), 639-644.

Gottfredson, M.R., & Hirschi, T. (1990). A general theory of crime. Stanford, CA: Stanford University Press.

Govoni, R., Rupcich, N., & Frisch, G.R. (1996). Gambling behavior of adolescent gamblers. *Journal of Gambling Studies*, *12*(3), 305-317.

Grant, J.E., Kushner, M.G., & Kim, S.W. (2002). Pathological gambling and alcohol use disorder. *Alcohol Research and Health*, 26(2), 143-150.

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

Griffiths, M., Parke, J., & Wood, R. (2002). Excessive gambling and substance abuse: Is there a relationship? *Journal of Substance Abuse*, *7*, 187-190.

Gupta, R., & Derevensky, J. (1997). Familial and Social Influences on Juvenile Gambling Behavior. *Journal of Gambling Studies*, 13(3), 179-192.

Gupta, R., & Derevensky, J.L. (1998). Adolescent gambling behavior: A prevalence study and examination of the correlates associated with problem gambling. *Journal of Gambling Studies*, *14*(4), 319-345.

Hardoon, K.K., & Derevensky, J.L. (2002). Child and adolescent gambling behavior: Current knowledge. *Clinical Child Psychology and Psychiatry*, 7(2), 263-281.

Hing, N., & Haw, J. (2009). The development of a multi-dimensional gambling accessibility scale. *Journal of Gambling Studies*, 25(4), 569-581.

Jacobs, D.F. (2000). Juvenile gambling in North America: An analysis of long term trends and future prospects. *Journal of Gambling Studies*, *16*(2), 119-152.

Jacobs, D.F., Marston, A.R., Singer, R.D., Widaman, K., Little, T., & Veizades, J. (1989). Children of problem gamblers. *Journal of Gambling Studies*, 5(4), 261-268.

Kearney, C.A., & Drabman, R.S. (1992). Risk-taking/gambling-like behavior in preschool children. *Journal of Gambling Studies*, 8(3), 287-297.

Langhinrichsen-Rohling, J. (2004). Gambling, depression and suicidality in adolescents. In J. Derevensky & R. Gupta (Eds.), *Gambling Problems in Youth: Theoretical and Applied Perspectives* (pp. 41-56). New York, NY: Kluwer Academic/Plenum Publishers.

Ledgerwood, D.M., & Petry, N.M. (2006). Psychological experience of gambling and subtypes of pathological gamblers. *Psychiatry Research*, 144(1), 17-27.

Lesieur, H.R., Cross, J., Frank, M., Welch, M., White, C. M., Rubenstein, G., et al. (1991). Gambling and pathological gambling among university students. *Addictive Behaviors*, *16*(6), 517-527.

MacCallum, F., & Blaszczynski, A. (2002). Pathological gambling and comorbid substance use. *Australian and New Zealand Journal of Psychiatry*, *36*, 411-415.

Magoon, M., & Ingersoll, G. (2006). Parental modeling, attachment, and supervision as moderators of adolescent gambling. *Journal of Gambling Studies*, 22(1), 1-22.

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

Myers, D.G. (1993). Social psychology (4th ed.). New York: NY: McGraw-Hill.

Nower, L., Gupta, R., & Derevensky, J. (2000). Youth gamblers and substance abusers: A comparison of stress coping styles and risk-taking behavior of two addicted adolescent populations. Paper presented at the meeting of the 11th International Conference on Gambling and Risk Taking, Las Vegas.

Oei, T.P.S., & Raylu, N. (2004). Familial influence on offspring gambling: a cognitive mechanism for transmission of gambling behavior in families. *Psychological Medicine*, *34*(07), 1279-1288.

Paterson, J., Tukuitonga, C., Abbott, M., Feehan, M., Silva, P., Percival, T., Butler, S., Cowley, E., Borrows, J., Williams, M., & Giles, L. (2002). *Pacific Islands Families: First Two Years of Life Study. Technical Report 1*. Auckland: Auckland University of Technology.

Paterson, J., Tukuitonga, C., Abbott, M., Feehan, M., Silva, P., Percival, T., Butler, S., Cowley, E., Borrows, J., & Williams, M. (2003). *Pacific Islands Families: First Two Years of Life (PIF:FTY) Study. Technical Report 2.* Auckland: Auckland University of Technology.

Paterson, J., Tukuitonga, C., Abbott, M., Feehan, M., Silva, P., Percival, T., Carter, S., Cowley-Malcolm, E., Borrows, J., Williams, M. & Schluter, P. (2006). Pacific Islands Families: First two years of life study - design and methodology. *The New Zealand Medical Journal*, *119*(1128). Available at http://www.nzma.org.nz/journal/119-1228/1814/content.pdf.

Perese, L.M., Bellringer, M.E., Williams, M.M., & Abbott, M.W. (2009). Two years on: Gambling amongst Pacific mothers living in New Zealand. *Pacific Health Dialog*, 15(1), 55-67.

Potenza, M.N., Feillin, D.A., Heninger, G.R., Rousanville, B.J., & Mazure, C.M. (2002) Gambling: An addictive behaviour with health and primary care implications. *Journal of General Internal Medicine*, *17*, 721-732.

R Development Core Team. (2011). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.

Salmond, C., Crampton, P., King, P., & Waldegrave, C. (2006). NZiDep: A New Zealand index of socioeconomic deprivation for individuals. *Social Science & Medicine*, 62, 1474-1485.

Samu, K.S., & Suaalii-Sauni, T.M. (2009). Exploring the 'cultural' in cultural competencies in Pacific mental health. *Pacific Health Dialog*, *15*(1), 120–137.

SHORE/Whariki. (2008). Assessment of the social impacts of gambling in New Zealand: Report to Ministry of Health. Auckland: Massey University.

Statistics New Zealand. (2007). *Pacific profile: 2006*. Retrieved 1 February 2011, from: http://www.stats.govt.nz/census/about-2006-census/pacific-profiles-2006.aspx

Statistics New Zealand. (2010). *National ethnic population projections: 2006(base)-2026 update*. Retrieved 28 April 2011, from:

http://www.stats.govt.nz/~/media/Statistics/Browse%20for%20stats/NationalEthnicPopulationProjections/HOTP2006-26/NationalEthnicPopulationProjections2006-26HOTP.ashx

Stinchfield, R. (2001). A comparison of gambling by Minnesota public school students in 1992, 1995, and 1998. *Journal of Gambling Studies*, 17(4), 273-296.

Tukuitonga, C., & Finau, S.A. (1997). The health of Pacific peoples in New Zealand up to the early 1990's. *Pacific Health Dialog*, *4*, 59-67.

Vachon, J., Vitaro, F., Wanner, B., & Tremblay, R.E. (2004). Adolescent gambling: relationships with parent gambling and parenting practices. *Psychology of Addictive Behaviors*, 18(4), 398-401.

Vitaro, F., Wanner, B., Ladouceur, R., Brendgen, M., & Tremblay, R. (2004). Trajectories of gambling during adolescence. *Journal of Gambling Studies*, 20(1), 47-69.

Volberg, R.A. (1994). The prevalence and demographics of pathological gamblers: implications for public health. *American Journal of Public Health*, 84(2), 237.

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

Wechsler, D. (2003). WISC-IV technical and interpretive manual. San Antonio, TX: Psychological Corporation.

Wickwire, E., Whelan, J., Meyers, A., & Murray, D. (2007). Environmental correlates of gambling behavior in urban adolescents. *Journal of Abnormal Child Psychology*, *35*(2), 179-190.

Winters, K.C., Stinchfield, R.D., Botzet, A., & Anderson, N. (2002). A prospective study of youth gambling behaviors [Article]. *Psychology of Addictive Behaviors*, *16*(1), 3-9.

Wynne, H., Smith, G., & Jacobs, D. (1996). *Adolescent gambling and problem gambling in Alberta*. Edmonton, Alberta: Alberta Alcohol and Drug Abuse Commission.

APPENDIX 1: Topic and question areas for mothers and children, PIF study Year 9

Dimension	Question description	Mothers	Children
Socio-demographic, cultural and envi	ronmental factors		
Demographic profile	Gender, age, ethnicity [#] ,	\checkmark	\checkmark
	Marital status, country of origin [#] , years lived in New Zealand, religion, education, present employment, income, economic problems	√	
Household composition	Family composition and relationships	\checkmark	
Housing	Type, tenure, frequency of relocation	\checkmark	
Child development			
Child behaviour	Modified from ALSPAC, Child Behaviour Checklist (Achenbach & Rescorla, 2001), Strengths and Difficulties Questionnaire (Goodman, 1997)	~	
	Modified Olweus Bully/Victim Questionnaire (olweus, 1989)		\checkmark
Cognitive, motor, psychosocial and language development	Developmental milestones (American Academy of Paediatrics)	\checkmark	
	WISC-IV (Wechsler, 2003), Self-Description Questionnaire (Herbert, Smith & Barnes, 1983)		\checkmark
Childhood activities and experiences	Child friendship (modified from NLSY Study)	\checkmark	
Family and household dynamics			
Sharing/support	Support from family members/others, sharing in care of child	\checkmark	
Parental involvement with school	PIF-developed	\checkmark	
Discipline and nurturing	The Parenting Practices Questionnaire (Robinson, 1995),	\checkmark	
	Forms of discipline used (modified from LAFANS Study)	\checkmark	
Care-giving environment	Modified HOME-MC (Caldwell & Bradley, 2003)	\checkmark	
Child nutrition	Dietary habits	\checkmark	
Child activity	Sleeping, watching television, playing games, physical activity	\checkmark	
Lifestyle factors			
Exposure to substances	Experience with taking/selling alcohol, cigarettes, marijuana and other drugs		✓
Alcohol consumption	Amount and frequency	\checkmark	
Smoking	Number of cigarettes smoked daily, number of other household smokers	\checkmark	\checkmark
Gambling	Game participation	\checkmark	\checkmark
	Frequency, expenditure, Problem Gambling Severity Index (Ferris & Wynne, 2001), problems due to someone else's gambling	✓	
Health issues			
Parental health	General Health Questionnaire - 12 (Goldberg & Williams, 1988) Ten-item Personality Inventory (Gosling, Rentfrow, & Swann, 2003)	√ √	
Life events	Modified Social Readjustment Rating Scale (Holmes & Rahe, 1967), life events in last 12 months	√	
Child illness episodes	Child health visits, frequency and reason. Treatments given and satisfaction with treatments, asthma symptoms	\checkmark	
Child oral health	Frequency of child cleaning teeth, enrolment with school dental service, dental treatment	✓	
Significant injuries	Requiring treatment by doctor/nurse	\checkmark	

[#] Data collected at baseline

APPENDIX 2: Mothers' gambling questions

Gambling activities

- 1. Could you please tell me which gambling activities you have bet or spent money on in the <u>last 12 months</u>:
 - a. Lotto (including Strike, Powerball and Big Wednesday) (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than monthly / monthly / weekly / daily or almost daily)
 - b. Keno (not in a casino) (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than monthly / monthly / weekly / daily or almost daily)
 - c. Instant Kiwi or other scratch tickets (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)
 - d. Housie (bingo) for money (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)
 - e. Horse or dog racing (excluding office sweepstakes) (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)
 - f. Sports betting at the TAB or with an overseas betting organisation (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)
 - g. Gaming machines or pokies at the casino (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)
 - h. Table games or any other games at the casino (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)
 - i. Gaming machines or pokies in a pub (not the casino or clubs) (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)
 - j. Gaming machines or pokies in a club (not the casino or pubs) (Yes/No)

- i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
- ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)
- k. Internet-based gambling (Yes/No)
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)
- 1. Other gambling activity. (Yes/No) *Please specify:*
 - i. If yes, how much do you usually spend in a typical MONTH? (To nearest \$5.00)
 - ii. If yes, how often do you take part in this activity? (Less than 1 hour / 1-2 hours / 3-5 hours / 6-12 hours / more than 12 hours)

If YES to any activities in Q.1, proceed to Q.2. If NO to all activities in Q.1, proceed to Q.10.

- 2. Thinking about the sorts of activities we have just mentioned, please tell me which is the gambling activity that you most prefer? (Options as in a 1 in Q.1)
- 3. If Yes to one of these activities, can you tell me why that is your most <u>preferred</u> gambling activity?
- 4. When you participate in the gambling activity that you most prefer, 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

Problem Gambling Severity Index (5 a - i)

- 5. Please rate <u>how often</u> you exhibit or do the following behaviours (never / sometimes / most of the time / almost always)¹⁶.
 - a. Thinking about the past 12 months, how often have you bet more than you could really afford to lose?
 - b. 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?
 - c. Thinking about the past 12 months, how often have you gone back another day to try to win back the money you lost?
 - d. Thinking about the past 12 months, how often have you borrowed money or sold anything to get money to gamble?
 - e. Thinking about the past 12 months, how often have you felt that you might have a problem with gambling?
 - f. 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?
 - g. Thinking about the past 12 months, how often have you felt guilty about the way you gamble, or what happens when you gamble?
 - h. Thinking about the past 12 months, how often has your gambling caused you any health problems, including stress or anxiety?
 - i. Thinking about the past 12 months, how often has your gambling caused any financial problems for you or your household?
 - j. Thinking about the past 12 months, how often have you wanted to stop betting money or gambling but didn't think you could?

¹⁶ 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

- 6. Have you <u>ever</u> felt the need to bet more and more money?
- 7. Have you ever had to lie to people about how much you gambled?
- 8. Do you feel that you have ever had a problem with gambling?
- 9. What was the largest amount of money you have ever lost in ONE day of gambling?

Questions around someone else's gambling:

- 10. Have you had problems because of <u>someone else's</u> gambling in the last 12 months? (Yes/No)
 - a. If Yes, can you say what kind of gambling was involved?
 - i. Lotto (including Strike, Powerball and Big Wednesday)
 - ii. Keno (not in a casino)
 - iii. Instant Kiwi or other scratch ticket
 - iv. Housie (bingo) for money
 - v. Horse or dog racing (excluding office sweepstakes)
 - vi. Sports betting at the TAB or with an overseas betting organisation
 - vii. Gaming machines or pokies at the casino
 - viii. Table games or any other games at the casino
 - ix. Gaming machines or pokies in a pub (not the casino or clubs)
 - x. Gaming machines or pokies in a club (not the casino or pubs)
 - xi. Internet-based gambling
 - xii. Other gambling activity. *Please specify:*
 - xiii. Not sure/don't know
 - b. If Yes, how would you describe the effect of that person's gambling on you?
 - i. I worry about it sometimes
 - ii. It is affecting my health
 - iii. It is hard to talk with anyone about it
 - iv. I am concerned about my or my family's safety
 - v. I am paying for it financially
 - vi. Other. Please specify:
 - c. If Yes, what relationship is that person to you?
 - i. Spouse or partner
 - ii. Parent
 - iii. Sibling (brother or sister)
 - iv. Adult child
 - v. Child younger than 18
 - vi. Uncle or Aunt
 - vii. Aiga or extended family member
 - viii. Friend
 - ix. Work colleague
 - x. Other. Specify:

APPENDIX 3: Children's gambling questions

- 1. Have you ever bet money (for example on a game of marbles or a board game or card game, or on a sports match, or when playing dice)? (Yes/No)
 - a. If YES, was this with (Circle one):
 - i. Friends
 - ii. Family
 - iii. Both
- 2. Have you played Housie? (Yes/No)
 - a. If YES, was this with (Circle one):
 - i. Friends
 - ii. Family
 - iii. Both
 - b. If YES, did you play for money? (Yes/No)
- 3. Have you played cards with your family or with friends? (Yes/No)
 - a. If YES, Can you say what card game it was?
 - b. If YES, did you play for money? (Yes/No)
- 4. Have you ever received an Instant Kiwi or scratch ticket as a present? (Yes/No)
- 5. Have you ever bought a Lotto, Big Wednesday or Keno ticket? (Yes/No)
 - a. If YES, state which (Circle one):
 - i. Lotto
 - ii. Big Wednesday
 - iii. Keno

APPENDIX 4: Mothers gambling activity participation in past 12 months (Year 9)

	Mothers (N=957)				
Activity	Y	(%)	N	(%)	
Lotto	440	(46.0)	517	(54.0)	
Keno	54	(5.6)	903	(94.0)	
Instant Kiwi	72	(7.5)	885	(92.5)	
Housie	67	(7.0)	890	(93.0)	
Horse/dog racing	6	(0.6)	951	(99.4)	
Sports betting	2	(0.2)	955	(99.8)	
Casino EGMs	45	(4.7)	912	(95.3)	
Casino table games	5	(0.5)	952	(99.5)	
Pub EGMs	24	(2.5)	933	(97.5)	
Club EGMs	3	(0.3)	954	(99.7)	
Internet gambling	1	(0.1)	956	(99.9)	
Other gambling	2	(0.2)	955	(99.8)	

Participation - number and percentage of total cohort

Participation - number and percentage of those who gambled

	Mothers (n=479)				
Activity	Y	(%)	N	(%)	
Lotto	440	(91.9)	39	(8.1)	
Keno	54	(11.3)	425	(88.7)	
Instant Kiwi	72	(15.0)	407	(85.0)	
Housie	67	(14.0)	412	(86.0)	
Horse/dog racing	6	(1.3)	473	(98.7)	
Sports betting	2	(0.4)	477	(99.6)	
Casino EGMs	45	(9.4)	434	(90.6)	
Casino table games	5	(1.0)	474	(99.0)	
Pub EGMs	24	(5.0)	455	(95.0)	
Club EGMs	3	(0.6)	476	(99.4)	
Internet gambling	1	(0.2)	478	(99.8)	
Other gambling	2	(0.4)	477	(97.6)	