

**SEVEN YEARS ON: A FOLLOW-UP STUDY OF  
FREQUENT AND PROBLEM GAMBLERS  
LIVING IN THE COMMUNITY**

**Report Number Two of the New Zealand Gaming Survey**

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## Acknowledgements

We are indebted to the 143 participants in this study who agreed to be interviewed on three occasions, twice in 1991 and once in 1998. These anonymous New Zealanders have provided information of a type hitherto not available in the gambling studies field and made an important contribution to the understanding of gambling and problem gambling.

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## Chief Executive's Foreword

It gives me great pleasure to release the second in a series of reports from the New Zealand Gaming Survey, *Seven Years On: A Follow-Up Study of Frequent and Problem Gamblers Living in the Community*.

The report is based on follow-up interviews conducted in 1998 with 143 of the 217 people who participated in Phase 2 of New Zealand's first national problem gambling prevalence survey in 1991. Phase 1 of the 1991 survey involved contacting 4053 people, mainly by telephone, and asking them about their gambling habits. Phase 2 involved in-depth, face-to-face interviews with 217 people selected from Phase 1 participants.

The last 7 years have seen a substantial growth in gaming opportunities in New Zealand. The report focuses upon the experiences of 4 distinct groups of people, within the 143 interviewed, during this period. Each group had varying levels of gambling involvement in 1991, and the report provides a valuable insight into how the last 7 years have impacted upon that gambling involvement.

Other reports from the New Zealand Survey are:

- A critical review of international literature on gambling participation and problem gambling prevalence.
- Results of a two-phase national problem gambling prevalence study:
  - ◊ Phase 1 is a key component of the whole study. It involved contacting over 6000 New Zealanders by telephone and asking them about their gambling habits.
  - ◊ Phase 2 builds on stage 1. It included in-depth, face-to-face interviews with approximately 300 persons who participated in stage 1.
- A survey of the gambling behaviour of recently incarcerated prisoners.
- A synthesis of all aspects of the research project.

I would like to commend Professor Max Abbott, Dr Rachel Volberg, Mr Maynard Williams and the National Research Bureau for their work in producing this report. While the Department commissioned the work, critiqued a number of drafts and arranged publication, the credit for the completed work is theirs.

The Department would like to acknowledge the assistance of Associate Professor Stephen Haslett, Director of the Statistics Research and Consulting Centre at Massey University, who reviewed the statistical treatment of the data as part of the Department's critiquing process.

Finally, I would like to thank the 143 individuals who agreed to participate in the Survey. Their co-operation has ensured that there is now up to date information on gambling and gambling-related problems in New Zealand.



Roger Blakeley  
Chief Executive  
Department of Internal Affairs



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# EXECUTIVE SUMMARY

## Introduction

During the latter part of the 1980s, there was an expansion in the variety of forms of gambling available in New Zealand and per capita gambling turnover and net expenditure increased markedly.

In 1991, Abbott and Volberg (1991; 1992; 1996a) conducted a national survey of problem and pathological gambling in New Zealand. This was the first national prevalence study internationally to use a validated measure of problem gambling. The 1991 study involved two phases. In the first phase, just over 4,000 adults were interviewed by telephone to determine their degree of gambling involvement and estimate the prevalence of current and lifetime problem and pathological gambling in the community. The second phase involved a smaller number of more in-depth, face-to-face interviews with sub-samples drawn from the phase one sample. Four groups were involved:

- People who currently gambled frequently on continuous forms of gambling, e.g. betting on horse and dog races or gaming machine participation, and who did not experience gambling-related problems
- People who currently gambled frequently on non-continuous forms of gambling, e.g. Lotto, and who did not experience gambling-related problems
- Lifetime probable pathological gamblers, i.e. people who scored five or more on the lifetime section of the Revised South Oaks Gambling Screen (SOGS-R)
- Lifetime problem gamblers, i.e. people who scored three or four on the lifetime section of the SOGS-R.

Phase two enabled more extensive information to be gathered from these groups concerning their gambling participation, problem gambling and the impact gambling had on various aspects of their lives.

Since the 1991 study was completed, there has been further growth in gambling availability and expenditure in New Zealand, albeit that expenditure has increased at a lower rate than from 1987 to 1990. New forms of gambling, including casinos in Auckland and Christchurch, have been introduced. Other forms, including gaming machines outside of casinos, have increased in number.

The present study is one component of a programme of research, the New Zealand Gaming Survey (NZGS), commissioned by the Department of Internal Affairs. In broad terms, the purpose of this research programme is to investigate the impact that this increase in gambling involvement has had on the lives of New Zealanders and to advance scientific understanding of gambling and problem gambling.

**The component of the NZGS outlined in this report is based on follow-up interviews with 143 people who originally participated in phase two of the 1991 national survey.**

**The 1998 follow-up study was primarily concerned with furthering knowledge about the nature of gambling in the general adult population, particularly with respect to the definition and measurement of gambling and problem gambling, to the stability and change over time in these behaviours and the identification of factors that are associated with this stability and change.**

It is the first study, internationally, to examine a community sample of regular gamblers and problem gamblers over time. It is longitudinal and prospective in nature.

A large amount of information was gathered and analysed. This summary notes, in skeletal form, some of the major findings and their implications.

## Major Findings

### Cautionary Note

- The relatively small size of the sample, the way in which it was derived from the larger 1991 sample, participant attrition from 1991 to 1998 and the fact that by 1998 all participants were aged 25 years or older means that a degree of caution must be used in generalising the findings of this study to all problem and pathological gamblers and frequent non-problem gamblers in the general population.

### Gambling Participation

- Generally, respondents reduced their gambling participation from 1991 to 1998 in major forms of gambling that have been available since 1991, although overall reported gambling expenditure increased slightly.
- Instant Kiwi evidenced the most notable decrease in popularity and participation. With respect to Instant Kiwi, significant reductions in regular participation occurred in all four gambling groups. Casinos evidenced the largest increase in participation although they were nominated by only six percent as their preferred form of gambling. Two forms of gambling introduced since 1991, namely TeleBingo and Daily Keno, were moderately popular in 1998.
- In addition to assessing reported changes in gambling participation and expenditure from similar questions that were asked in both 1991 and 1998, respondents were asked for their own opinions about whether or not their overall gambling involvement had changed between the two surveys. Forty-three percent said they believed it had stayed much the same, 18 percent that it had decreased a lot and 15 percent that it had decreased a little. Two percent said it had increased a lot and 23 percent that it had increased a little.
- The largest reductions in gambling participation were evident among the groups that, in 1991, were composed of lifetime probable pathological and problem gamblers. There were particularly large reductions in gaming machine (outside casinos) participation in these two groups. Apart from Instant Kiwi, significant changes in gambling participation were not evident in the two non-problem groups.

### Changes in Problem Gambling and Participation Status

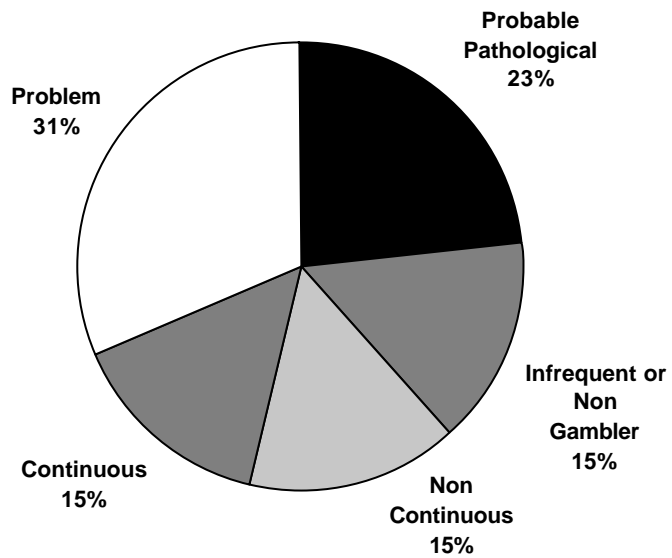
- Of the 13 participants who were identified as current probable pathological gamblers in 1991, three (23%) remained probable pathological gamblers in 1998 and a further four (31%) were classified as problem gamblers. The remainder became non-problem gamblers with equal numbers in the frequent continuous gambling, frequent non-continuous gambling, and irregular or non-gambler categories.
- Of the 22 participants who were identified as current problem gamblers in 1991, two (9%) retained this status in 1998, three (14%) became probable pathological gamblers and the remainder were classified as non-problem gamblers. The majority of the non-problem gamblers gambled frequently on non-continuous forms in 1998.

**Figure 1: 1998 Gambling and Problem Gambling Status for Participants in each of the Current 1991 Gambling /Problem Gambling Groups**

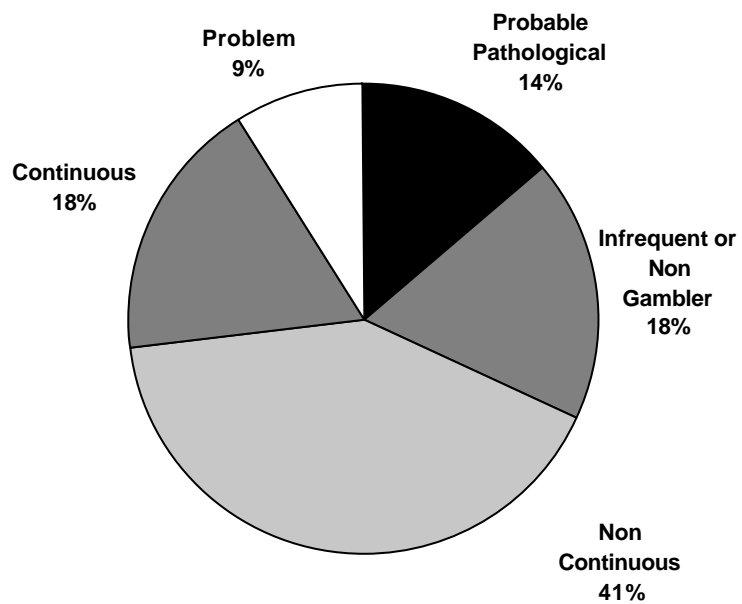
**1991 Classification**

**1998 Classification**

**Current Probable  
Pathological Gamblers  
(n = 13)**



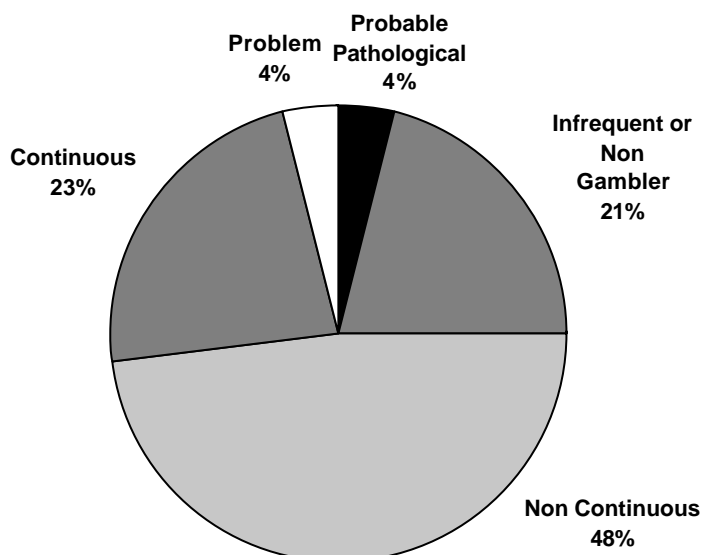
**Current Problem  
Gamblers (n = 22)**



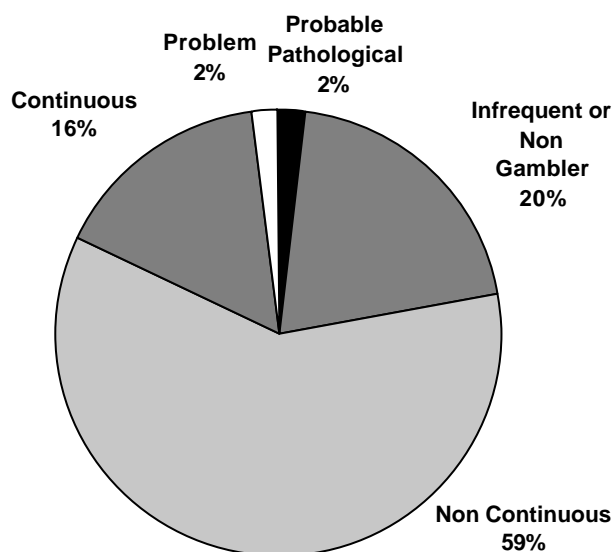
**1991 Classification**

**1998 Classification**

**Regular Continuous Gamblers (n = 48)**

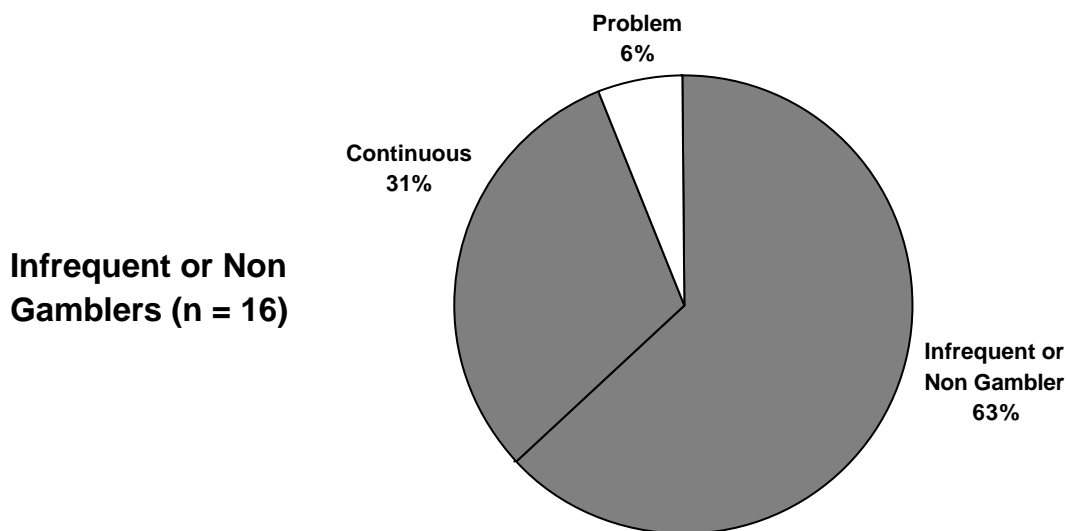


**Regular Non Continuous Gamblers (n = 44)**



**1991 Classification**

**1998 Classification**



- Of the 48 participants who were identified as frequent continuous gamblers in 1991 (i.e. they gambled weekly or more on forms of gambling such as track betting or gaming machines) two (4%) became probable pathological gamblers in 1998 and a further two (4%) became problem gamblers. Eleven (23%) remained frequent continuous gamblers, 23 (48%) became frequent non-continuous gamblers and ten (21%) became infrequent or non-gamblers.
- Of the 44 participants who were identified as frequent non-continuous gamblers in 1991 (i.e. they gambled weekly or more on forms of gambling such as Lotto or raffles), one (2%) became a probable pathological gambler and a further one (2%) became a problem gambler. The majority (26; 59%) remained frequent non-continuous gamblers, seven (16%) became frequent continuous gamblers and nine (20%) became infrequent or non-gamblers.
- Of the 16 participants who were identified as infrequent or non-gamblers in 1991, one (6%) became a problem gambler, five (31%) became frequent continuous gamblers and ten (63%) remained infrequent or non-gamblers. In 1991, these 16 participants were all people who scored as problem or probable pathological gamblers on the lifetime SOGS-R but who scored within the non-problem range on the current SOGS-R.
- Changes in categorisation for each of the 1991 current gambling participation/problem gambling categories are portrayed in Figure 1.

#### Alcohol-related Problems

- Fifty-seven of the 143 participants (as measured by the AUDIT scale) experienced alcohol-related problems in 1991. Thirty-five (61%) of these 57 people continued to experience alcohol-related problems in 1998. This overall reduction in prevalence was statistically significant.
- Forty percent of 1991 lifetime probable pathological gamblers and 21 percent of lifetime problem gamblers reported experiencing alcohol-related problems in 1998. These percentages were not significantly different from what they were for these participants in 1991 (54% and 29% respectively) and they remained high relative to people in the two non-problem gambling groups.
- Nine percent of the people who did not experience alcohol-related problems in 1991 experienced problems when they were reassessed using the AUDIT in 1998.

### Psychological Disturbance

- Thirty-one of the 143 participants were assessed by the GHQ-12 as currently experiencing clinically significant levels of psychological disturbance in 1991. Eight (26%) of these 31 people were assessed as currently experiencing this degree of psychological disturbance when re-interviewed in 1998.
- Ten percent of 1991 lifetime probable pathological gamblers and 21 percent of lifetime problem gamblers experienced psychological disturbance in 1998. In the case of probable pathological gamblers, there was a statistically significant reduction in psychological disturbance from 1991 to 1998. The slight reduction for problem gamblers was not significant.
- Eleven percent of the people who did not experience psychological disturbance in 1991 were deemed to be experiencing psychological disturbance when they were re-interviewed in 1998.

### Participants' Reasons for Changes in Gambling Participation

- The most frequently mentioned reasons given for increased gambling participation included 'more finances/better income', 'more opportunities/options' and 'something to do/day out'.
- The most frequently mentioned reasons for reduced gambling participation included 'lack of finances', 'change of environment/lifestyle', 'increased awareness/older and wiser' and 'lack of interest'. 'Marriage' or 'having a family' was a further reason given by a significant number of participants who were probable pathological or problem gamblers in 1991. 'Relationship or marriage breakup' was also mentioned in 1998 by a number of 1991 probable pathological gamblers as reasons for changed gambling behaviour.

### Help-seeking and Overcoming Problems

- None of the 1998 participants reported (in 1998) ever having sought professional or specialist help for a gambling problem.
- Of the 13 respondents who themselves considered that at some stage they had experienced gambling problems and had had periods when they had overcome their problems, all 13 believed that this had been accomplished by their own efforts.
- Although no respondents acknowledged having sought professional help for their own gambling-related problems, 12 (8%) said they had done so for friends or family members. Five mentioned Gamblers Anonymous and a few mentioned general medical practitioners and mental health professionals as sources of help for friends or family members.

### The Measurement of Problem Gambling

- The problem gambling measures used in the study were found to be moderately to strongly related, suggesting that they were measuring essentially the same underlying construct.
- Within the lifetime probable pathological gambling group, it was found that lifetime performance on one of the problem gambling measures (the SOGS-R) changed over time. Specifically, many people who had scored as probable pathological gamblers on this measure in 1991 did not score this way in 1998. Technically, this phenomenon is referred to as 'negative incidence'. Rather than being a valid measure of lifetime problem gambling status, there were indications that this measure is responsive to changes in problem gambling status and current gambling behaviour. This has important



implications for the way in which previous problem gambling research has been interpreted and future studies are conducted.

### 1991 Predictors of Problem Gambling in 1998

- Of the many factors measured in 1991, the strongest independent predictors of current probable pathological gambling and problem gambling in 1998 were track betting, current problem gambling status and alcohol problems.

### The Impact of the Introduction of Casinos

- With respect to participants who were resident in Auckland and Christchurch, there was no evidence to support the view that the introduction of casinos resulted in significant changes to their gambling participation or levels of problem gambling.

## **Conclusions**

- Probably the most notable finding of this study was the large reduction in gambling involvement and gambling-related problems that was evident for participants who were classified as current probable pathological and problem gamblers in 1991. A significant reduction in psychological disturbance was also found over time for probable pathological gamblers.
- Although approximately a half of 1991 current probable pathological gamblers continued to experience some gambling-related problems in 1998, less than a quarter remained probable pathological gamblers. This reduction in the prevalence of problematic gambling from 1991 to 1998 was greater than expected and contradicts the conventional clinical conceptualisation of pathological gambling as a chronic, lifelong disorder. While this portrayal may apply to a number of participants in the present study, it would appear that many people with serious gambling-related problems overcame them for varying periods of time. Further longitudinal research is necessary to corroborate this finding, to see if such changes are sustained beyond the seven year period that applied to this investigation, and to determine whether or not similar outcomes pertain to more serious pathological gamblers who present in treatment settings.
- It is of interest that none of the participants in this study, including those who showed substantial reductions in problem gambling or psychological disturbance, had sought specialist help from counselling agencies, health professionals or mutual help organisations. While none had sought help for themselves, a small number reported doing so for family members or friends whom they believed had gambling problems. Those who reported overcoming gambling problems generally attributed this to their own efforts, occasionally supported by friends or family. It would be helpful if future research focussed on this process of 'self recovery' with a view to identifying the components that contribute to sustained, positive outcomes.
- Given that probable pathological and problem gamblers in the study had been interviewed twice in 1991 with respect to problem gambling, it is surprising that none of them subsequently sought professional help for their problems. While there were no specialist problem gambling services available at the time of the initial interviews, since then a national helpline and a range of clinical services have been established. This suggests that substantial numbers of pathological and problem gamblers are not accessing these services. It would be useful to know more about why this is the case and how outreach can be improved. It would also be useful to know the extent to which existing services 'add value' by way of enhancing apparently high 'natural' or 'self recovery' rates.
- Study participants with less severe gambling problems (1991 current problem gamblers) evidenced very high rates of change over time. This finding is consistent with the

reference that is sometimes made to such people as being 'in transition'. As indicated, very few remained problem gamblers. Most became non-problem gamblers. However, a significant minority developed more serious gambling problems. This underlines the importance of considering this group as being at risk for progression to pathological gambling and an appropriate target for education, early intervention or prevention programmes.

- The findings of this study extend those of the 1991 baseline survey with respect to associations between alcohol and gambling problems. As in 1991, a high percentage of probable pathological gamblers and a moderate percentage of problem gamblers had co-morbid alcohol problems. Indeed, more 1991 probable pathological gamblers had clinically significant alcohol problems in 1998 than continued to experience serious gambling-related problems. In contrast to the reductions in problematic gambling among the 1991 current problem and probable pathological gamblers, there was no significant reduction in alcohol problems among these two groups of participants.
- The prospective nature of the study enabled risk factors, as assessed in 1991, to be examined in relation to problem gambling status in 1998. As expected, people with higher levels of problem gambling severity in 1991 (as measured by the current SOGS-R scale) had a substantially increased risk for current problem and pathological gambling in 1998. A surprising finding was that even when the effects of 1991 problem gambling severity were controlled statistically, the presence of alcohol problems in 1991 remained a strong independent predictor of future gambling problems. This finding, taken together with the finding that 1991 probable pathological gamblers were also at high risk for alcohol problems seven years later, points to the importance of learning more about the relationships between these two types of mental disorder. These findings also suggest that clinicians would be advised to assess co-morbidity and address it in their treatment programmes. While further research is required on this matter, the inter-linkages between alcohol and gambling problems appear to be such that the current practice of providing separate, specialist services for these disorders may warrant review.
- The finding that a preference for track betting in 1991 was an additional major risk factor for future problem gambling is consistent with participation in this form of gambling also being strongly associated with problem gambling in 1991. Gaming machine participation was also strongly associated with problem gambling in the 1991 survey, especially in the case of younger probable pathological gamblers. Track-betting participation did not reduce significantly between 1991 and 1998 for the 1991 probable pathological or problem gamblers. In contrast, within the two problematic gambling groups, substantial reductions were found for gaming machine involvement. This suggests that problem and pathological gamblers whose problems are linked with track betting have a significantly worse prognosis than those whose problems are associated with machine gaming, which seems to be an age-related activity. Rather than considering problem and pathological gamblers as a homogenous clinical entity, these findings imply that consideration should be given to examining the characteristics of sub-groups whose problems are related to particular forms of gambling.
- Although a number of the findings outlined in this report are consistent with the view that the SOGS-R provides a robust and valid measure of problem gambling, one aspect of this widely used instrument is seriously challenged. As indicated, it was found that SOGS-R lifetime performance evidenced significant change over time. Specifically, a significant number of 1991 lifetime probable pathological and problem gamblers no longer scored within these categories when reassessed in 1998. While this finding requires corroboration with other samples of problem gamblers before it is regarded as definitive, it potentially has very important implications for the interpretation of previous problem gambling studies and the conduct of future research. These implications and further consideration of some other issues arising from the results of the present study are outlined in Chapter 4 of this report.



# 1. INTRODUCTION

This report provides an account of the major findings from a study of adults selected from the general adult population and interviewed in depth, on two occasions, seven years apart. At the time of their initial interview in 1991, these respondents were either regular gamblers who had not experienced significant gambling related problems or people who indicated that they currently, or in the past, were problem gamblers. The findings are discussed in the context of changes in gambling participation within New Zealand society and recent literature on gambling and problem gambling. The study is of particular interest because it is the first internationally to examine changes in gambling behaviour, including problem gambling, prospectively over time within the same group of people.

In their comprehensive review of North American problem gambling prevalence studies, Shaffer, Hall and Vander Bilt (1997) concluded:

To better understand the nature of disordered gambling prevalence, investigators must begin to conduct larger scale studies of special populations, and smaller but prospective studies of adult and youth segments of the general population (p. 84).

The present study, involving 143 participants, falls into Shaffer et als' (1997) "smaller but prospective" category. There are few such studies in the literature on the addictions generally and only one in the gambling field to date (Cottler, 1998).

**The general aim of the study is to advance scientific understanding of the nature of gambling and problem gambling in the general adult population, particularly with respect to their definition and measurement and stability and change over time and to identify factors that are associated with this stability and change.**

The present study is part of the 1998-1999 New Zealand Gaming Survey (NZGS), conducted by a research consortium directed by Professor Max Abbott. The principal investigators are Professor Abbott and Dr Rachel Volberg. Other consortium partners include Statistics New Zealand, the National Research Bureau and Taylor Baines and Associates.

The NZGS was commissioned by the Department of Internal Affairs. The Department administers New Zealand's three pieces of gaming legislation and services the Lottery Grants Board, which distributes the profits of the Lotteries Commission to the community. Most of the funding for the research programme derives from undistributed profits of the Lotteries Commission (applied to the project at the direction of the Minister of Internal Affairs). Some funding also comes from the Committee on Problem Gambling Management (COPGM), an organisation with representation from all major sectors of the gaming industry and problem gambling treatment providers. Notwithstanding the sources of funding, the director's contract is with the Crown through the Department of Internal Affairs, and no agency or organisation is empowered to control the research or to exercise editorial control over the publication of the research results.

The other components of the NZGS include:

- Literature Review
- Consultation
- National Prevalence Survey: Phase One
- National Prevalence Survey: Phase Two
- Prison Study
- Synthesis Report and Framework for Future Studies.

The terms of reference for this research programme were developed by the Department of Internal Affairs in consultation with a wide variety of statutory, industry and national voluntary sector organisations. The intent of the research is to inform Government policy on gaming and responses to problem gambling and contribute to local and international scientific knowledge concerning aspects of gambling and problem gambling. It is also expected to provide information that has relevance to a variety of other stakeholder and end-user organisations with an interest in gambling and/or problem gambling.

Before describing the present study, some background and broad contextual information is provided to assist in subsequent discussion of the major findings. This includes historical, semantic, methodological and substantive research considerations.

## **2. BACKGROUND AND CONTEXT**

### **2.1 Gambling and Problem Gambling**

Gambling or gaming (these terms are used interchangeably in this report) refer to a variety of activities which have in common the risking of something of value in exchange for something of greater value (Thompson, 1997). Definitions of gambling and the characteristics of major forms of gambling are examined in Abbott and Volberg (1999). In contrast to other high-risk undertakings, such as starting a new business venture, gambling activities are usually presented as recreation or entertainment. These activities are also widely regarded as forms of gambling within general society.

There is archaeological and historical evidence of gambling activities in many ancient civilisations throughout the world. It would appear from these accounts that gambling practices arose independently in a number of different societies. There is also documentation and indications of gambling practices having spread widely across cultural and geographic boundaries. Some tribal societies do not appear to have had a history of gambling prior to colonial times. Populations in this category apparently include pre-European contact indigenous Australians (Foote, 1996), New Zealand Māori and those of some other Pacific Islands (Abbott & Volberg, 1999). A number of Polynesian languages do not have a word for gambling (North Health, 1996).

Attitudes towards gambling and the degree of control exercised by state and other authorities over gambling have varied markedly throughout history. Many countries have experienced alternating phases of liberalisation and restriction. Carpenter (1988) provides an interesting example of state regulation of gambling in Spain during the Thirteenth Century, introduced to reduce disruption to the social order and ensure that the crown secured a portion of gambling revenue.

Other than in most Islamic states, during the past two decades gambling has proliferated rapidly and it is now a popular pastime throughout the world. Internationally, legal gambling includes lotteries, casinos, betting on horses and dog races and sports events, charitable gambling and wagering on electronic gaming machines in bars, restaurants, hotels and other settings. While public attitudes are generally more accepting of gambling than was the case ten or 20 years ago, as in earlier historical periods of gambling expansion, there are indications of growing public and official concern about actual and perceived adverse social impacts (Abbott & Volberg, 1999).

Abbott & Volberg (1999) describe a number of emerging, inter-related trends that are expected to continue to influence the evolution and further expansion of gambling during the first decades of the 21<sup>st</sup> Century. These include the growing legitimacy of gambling, the intersection of electronic technologies used in financial markets and gambling venues, the impacts of the Internet on all forms of gambling, accelerating globalisation forces and the spread of gambling to previously non-gambling settings. While noting earlier periods of gambling expansion within particular societies and cultures, Abbott and Volberg suggest that these inter-linked changes make the present global spread of gambling qualitatively different from what has occurred before. They argue that these changes blur traditional distinctions between different forms of gambling activity and make them difficult to regulate.

Until quite recently, the legalisation of gambling proceeded with little consideration of the potential negative impacts that gambling can have on individuals, families and communities (Volberg & Dickerson, 1996). During the past decade, in conjunction with the rapid expansion of legal gambling, there has been an increased awareness that gambling-related problems exist and may be exacerbated by policies that promote or allow the expansion of gambling opportunities. In response to this awareness and lobbying from community and professional groups, some governments have facilitated the development of services for people who experience gambling problems and have commissioned research to provide information

about the number of people in the community who have such problems and their characteristics (Volberg, Dickerson, Ladouceur & Abbott, 1996).

## **2.2 The Study of Gambling Participation**

Two general approaches have been taken to assess gambling participation within populations, namely the collection and examination of aggregate expenditure data and undertaking general population surveys.

The first method uses aggregate expenditure information from government or industry sources. Turnover (total expenditure) and consumer losses (net expenditure) are typically available. While this type of information is often accessible at national or regional levels, it is of variable accuracy and caution is required when making comparisons over time or between jurisdictions.

The second method involves general population surveys. In these surveys, respondents are usually asked which forms of gambling they have participated in, how frequently they participate in each form and how much they spend. Information from surveys is subject to errors from sampling and measurement. Since samples and methodology often differ markedly between studies, extreme caution is necessary when making comparisons between studies even in the same jurisdiction.

The two methods of assessing gambling participation and expenditure generally yield broadly similar and complementary accounts of gambling within a particular population. In most instances, official data sources generate higher expenditure estimates than community surveys, although the level of agreement varies considerably from one type of gambling to another (Abbott & Volberg, 1999). The phrasing of questions can also have a marked influence on survey expenditure estimates (Blaszczynski, Dumlao & Lange, 1997; Volberg, Moore, Christiansen, Cummings & Banks, 1998).

Although gambling participation and expenditure have increased globally, there are large differences between countries in this regard. In some countries there are also considerable differences between regions or between large cities and small towns or rural areas. There are also often differences between sociodemographic groups including those defined by gender, ethnicity, age, marital status, religion, and socioeconomic and employment status. International literature, relevant to this topic, is reviewed in Abbott & Volberg (1999).

## **2.3 Further Consideration of Gambling and Problem Gambling**

### **Gambling**

As implied in section 2.1, gambling is a broad concept. It includes a diversity of activities, undertaken in a wide variety of settings, appealing to different sorts of people and perceived in various ways by participants and observers. Gambling industry and marketing executives are well aware of this differentiation between the various forms of gambling and within the gambling market place. Failure to appreciate this diversity can limit scientific understanding of gambling. A related reason to note and examine differences between the various forms of gambling and gambling contexts arises from the accumulating evidence that some types of gambling are more strongly associated with the development of gambling problems than others.

Gambling activities have been classified in a number of different ways on the basis of a variety of characteristics. One particularly significant classificatory dimension pertains to the degree of skill and luck involved (Volberg & Banks, 1994; Walker, 1992). Activities involving pure chance include most lotteries and bingo games as well as a number of traditional casino

games such as roulette. Activities involving a mix of luck and skill include card games such as blackjack, poker and baccarat. Some others in the mixed category include betting on horse racing and sports which require players to construct subjective probabilities of event outcomes.

Walker (1992), among others, has argued that gambling activities involving an intermediate blend of skill and luck are more likely than other forms of gambling to lead to problems among regular participants. With regard to problem gambling, some casino table games, track betting and other intermediate forms also provide opportunities for escalating the size of bets, chasing losses and both betting and losing more than intended. Some gaming machine games such as video poker also include an element of skill or 'perceived skill', although most involve pure chance. Even when the outcome of such games are determined entirely by chance, most machines foster the illusion that some skill is involved and many players believe they can influence machine outcomes.

Event frequency - the number of opportunities to gamble in a specified period of time - is another important feature differentiating gambling activities (Griffiths, 1998a). Some forms of gambling involve particularly rapid cycles of stake, play and determination whereas others are much slower (Dickerson, 1993b). Gambling activities in the former category are often referred to as continuous types of gambling. Those in the latter are considered to be non-continuous (Abbott & Volberg, 1992). Gambling activities can be ranked on a scale that ranges from infrequent to very rapid. Research increasingly suggests that event frequency is particularly relevant to problem gambling development (Abbott & Volberg, 1999).

## **Problem Gambling**

The majority of people in most countries where surveys have been conducted have, at some stage in their lives, participated in one or more forms of gambling activity. For example, a recent national survey in the United States found that 85 percent of American adults reported having gambled; 63 percent in the last year (National Opinion Research Center, 1999). State level surveys in Australia indicate lifetime participation in excess of 90 percent with past year participation ranging from 64 to 96 percent. These and other national and regional gambling participation surveys are reviewed in Abbott & Volberg (1999).

Most people surveyed say they take part in gambling activities because they enjoy them and obtain benefits from their participation. Some patterns of gambling participation may contribute to personal wellbeing, mental health and self-esteem although this has been little investigated (Volberg, Reitzes & Boles, 1997). However, like many 'good' things in life, gambling has a dark side. While, for the majority, gambling appears to be generally positive and non-problematic, for a minority gambling is associated with difficulties of varying severity and duration. Some regular gamblers develop significant, debilitating problems that also typically result in harm to people close to them and to the wider community (Abbott & Volberg, 1999).

Wildman (1998) cites numerous literary and historical references to problem gambling and associated personal and social costs. Public and official recognition of such problems probably played a part in the introduction of measures taken at various times in the past to regulate or prohibit gambling activities. However, until relatively recently, problem gambling was widely regarded as a moral vice or character flaw rather than a mental disorder (Walker, 1992). In this respect it is similar to the excessive use of alcohol and some other substances that have also come to be regarded as forms of mental disorder.

Pathological gambling was included in the 1977 Ninth Edition of the International Classification of Diseases (ICD 9). In 1980, it was also included in the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-III) (American Psychiatric Association, 1980). Although the clinical criteria for pathological gambling were similar to those for alcohol and drug dependence, it was classified as a disorder of impulse control. Examples of other



disorders in this category include kleptomania and compulsive fire lighting. At each revision of the DSM, namely the DSM-III-R (1987) and DSM-IV (1994), the diagnostic criteria for pathological gambling have changed somewhat (refer to Figure 2). As with other disorders, it is expected that the conceptualisation and definition of serious problem gambling will continue to be refined in response to the findings of future research.

Presently, the essential features of pathological gambling are a continuous or periodic loss of control over gambling; a progression, in gambling frequency and amounts wagered, in the preoccupation with gambling and in obtaining monies with which to gamble; and a continuation of gambling involvement despite adverse consequences (American Psychiatric Association, 1994).

The more specific DSM-IV diagnostic criteria are outlined in Figure 2.

A formal diagnosis of pathological gambling is arrived at by an appropriately qualified and experienced clinician (typically a psychiatrist or clinical psychologist) following an extensive clinical interview with a client or patient. Clinical interviews include the taking of a detailed life history, asking questions and making observations specific to pathological gambling and undertaking similar examinations with respect to other aspects of mental health status. Often, this information will be supplemented by an interview with family members or other people who know the patient well and examination of previous relevant clinical documentation. To make a diagnosis of pathological gambling, the clinician is required to determine that a patient has met a specified number of the diagnostic indicators listed in Figure 2.

In contrast to the situation with many other mental disorders, there is no requirement for the clinician to determine that the pathological gambling diagnostic criteria were met within a specified time period. In other words, it is not necessary for the symptoms to have been present during the preceding 12 months or to have been clustered together at some time in the past. Rather, the diagnosis is made on the basis of the patient's cumulative experience of gambling-related problems. This reflects an underlying belief that pathological gambling, like many forms of drug dependence, is a chronic or relapsing disorder. In contrast, there is provision within the DSM-IV for alcohol and other drug dependencies to be diagnosed but described as "in remission" if the patient has been free of symptoms for a substantial period of time.

The diagnostic term 'pathological gambling' has now largely replaced its Gamblers Anonymous (GA) predecessor 'compulsive gambling' in clinical settings and in professional and scientific discourse in most parts of the world including New Zealand (Ministry of Health, 1996).

The term 'problem gambling' is used in many different ways. In the present report it is used as employed by the National Council on Problem Gambling in the United States, namely to indicate all of the patterns of gambling behaviour that compromise, disrupt or damage personal, family or vocational pursuits (Cox, Lesieur, Rosenthal & Volberg, 1997). Pathological gambling can be regarded as a sub-category of problem gambling. Problem gambling will also be used in this report to refer to people who fall short of diagnostic criteria for pathological gambling yet experience at least some gambling-related problems in one or more spheres of life. The two different meanings will usually be apparent from the context in which they occur.

In some situations, the authors of the present report consider it desirable to augment DSM diagnoses with measures that assess various dimensions of gambling and problem gambling with greater precision and facilitate linkage with theory and bodies of knowledge from psychology and other relevant disciplines.

## **Figure 2: American Psychiatric Association Pathological Gambling Criteria**

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DSM-III Criteria (1980)

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- A. The individual is chronically and progressively unable to resist impulses to gamble.
- B. Gambling compromises, disrupts, or damages family, personal and vocational pursuits, as indicated by at least three of the following:
  - 1. Arrest for forgery, fraud, embezzlement; or income tax evasion because of attempts to obtain money for gambling
  - 2. Default on debts or other financial responsibilities
  - 3. Disrupted family or spouse relationship because of gambling
  - 4. Borrowing of money from illegal sources (loan sharks)
  - 5. Inability to account for loss of money or to produce evidence of winning money, if this is claimed
  - 6. Loss of work because of absenteeism to pursue gambling activity
  - 7. Necessity for another person to provide money to relieve a desperate financial situation
- C. The gambling is not caused by Antisocial Personality Disorder.

#### **DSM-III-R Criteria (1987)**

Maladaptive gambling behaviour as indicated by at least four of the following:

- 1. Frequent preoccupation with gambling or with obtaining money to gamble
- 2. Frequent gambling of large amounts of money or over a longer period of time than intended
- 3. A need to increase the size or frequency of bets to achieve the desired excitement
- 4. Restlessness or irritability if unable to gamble
- 5. Repeated loss of money by gambling and returning another day to win back losses ('chasing')
- 6. Repeated efforts to reduce or stop gambling
- 7. Frequent gambling when expected to meet social or occupational obligations
- 8. Sacrifice of some important social, occupational, or recreational activity to gamble

Continuation of gambling despite inability to pay mounting debts, or despite other significant social, occupational, or legal problems that the person knows to be exacerbated by gambling.

#### **DSM-IV Criteria (1994)**

- A. Persistent and recurrent maladaptive gambling behaviour as indicated by five (or more) of the following:
  - 1. Is preoccupied with gambling (e.g., preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble)
  - 2. Needs to gamble with increasing amounts of money in order to achieve the desired excitement
  - 3. Has repeated unsuccessful efforts to control, cut back or stop gambling
  - 4. Is restless or irritable when attempting to cut down or stop gambling
  - 5. Gambles as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)
  - 6. After losing money gambling, often returns another day to get even ("chasing" one's losses)
  - 7. Lies to family members, therapists, or others to conceal the extent of involvement with gambling
  - 8. Has committed illegal acts such as forgery, fraud, theft, or embezzlement in order to finance gambling
  - 9. Has jeopardised or lost a significant relationship, job, or educational or career opportunity because of gambling
  - 10. Relies on others to provide money to relieve a desperate financial situation caused by gambling.
- B. The gambling is not better accounted for by a manic episode.

## 2.4 The Measurement of Gambling Problems

A number of methods have been developed to measure problem and pathological gambling for clinical and research purposes. These methods are outlined in Abbott and Volberg (1999) and Rönnerberg, Volberg & Abbott et al (1999). The many measures now available vary considerably with respect to the degree to which their psychometric properties, including validity and reliability, have been formally examined. They also vary enormously with respect to the extent with which they have been used, both in absolute terms and within particular contexts.

Since the advent of DSM-III, a number of instruments have been developed for use with adults and adolescents. The initial measure of this type was developed along with a variety of other measures of particular mental disorders that made up the Diagnostic Interview Schedule (DIS). The DIS was designed primarily for community surveys of mental disorders and it was deployed in the Epidemiological Catchment Area Studies in the United States during the early 1980s. This general instrument was subsequently used in a number of other countries to assess the prevalence of a broad spectrum of psychiatric disorders in particular communities. The pathological gambling component of the DIS appears to have been used in only a few of these studies, including one in Christchurch, New Zealand, in 1986 (Wells et al, 1989; 1992). The early version of the DIS pathological gambling scale that was used in Christchurch involved only a small number of items and was not adequately validated or assessed as a psychometric instrument (Abbott & Volberg, 1999).

The most widely used measure based on DSM diagnostic criteria is the South Oaks Gambling Screen (SOGS) and subsequent modifications to it, particularly the SOGS-R (Abbott & Volberg, 1991; 1992; 1996a). The original SOGS was designed in the United States for use as a screening instrument in clinical settings (Lesieur & Blume, 1987). However, it was adapted for use in community surveys and has been used in the large majority of community prevalence surveys of problem gambling completed during the past ten years (Volberg & Dickerson, 1996; Shaffer, Hall & Vander Bilt, 1997).

The SOGS was based on DSM-III criteria and validated against the DSM-III-R. The measure has been shown to have high internal consistency and test-retest reliability and to correlate strongly with DSM-III-R diagnoses. Its overall diagnostic efficiency was impressive in the original validation groups, namely GA members, university students and hospital workers (Lesieur & Blume, 1987).

The SOGS-R was developed for the 1991 New Zealand National Survey of Problem and Pathological Gambling. The original SOGS was modified to provide a measure of both current (past 6 months) and lifetime problem and probable pathological gambling. The inclusion of the word "probable" here is to indicate that people so classified have been identified on the basis of their score on a screening instrument rather than from a clinical interview undertaken by a mental health practitioner.

Since 1991, there have been approximately 40 prevalence surveys that have employed the SOGS-R or screening instruments based closely on it. Other than state level surveys in Australia and one survey in South Dakota in the United States that have used the same six month current measure that was included in the 1991 New Zealand national study, these surveys have used a 12 month time frame. In contrast to the Australian studies, but consistent with the New Zealand research, they have also included a lifetime measure (Abbott & Volberg, 1999).

Although reliable and having a high degree of diagnostic accuracy when used in clinical settings, it is important to note that the diagnostic efficiency of the SOGS and SOGS-R has not been established for use in community surveys. One partial exception is the 1991 New Zealand national survey. This aspect of the 1991 study will be outlined in more detail below. This is a significant shortcoming in the gambling studies field since, without this form of

validation, it is not known to what extent prevalence estimates correspond to estimates that would be obtained from diagnostic interviews using DSM or ICD criteria.

The original SOGS was designed for face-to-face administration. However, the SOGS and SOGS-R have since also been administered via telephone interview and as a self-completion questionnaire. Apart from a study in Sweden, where it was shown that self completion and telephone interview presentation of the SOGS items yield comparable prevalence estimates (Abbott, Rönnerberg & Volberg, 1997), it is not known what effect these different modes of administration have on participant responding. However, there are some indications that different results may be obtained when face-to-face and telephone interview formats are employed (Abbott & Volberg, 1999).

One reason for the widespread use of the SOGS and SOGS-R in clinical and epidemiological research is the considerable advantage that accrues from using a standard measure to facilitate comparison across different populations (Walker & Dickerson, 1996). Although some concerns were expressed about aspects of SOGS and SOGS-R performance in non-clinical settings, it remained the de facto 'gold standard' in the field until the late 1990s following the publication of the new DSM-IV criteria.

A number of the concerns about the SOGS and SOGS-R are common to all community survey research. These concerns include increasing refusal and reducing response rates, respondent denial and a variety of sampling and other methodological issues (Abbott & Volberg, 1996a, 1999; Culleton, 1989; Lesieur, 1994; Shaffer, Hall & Vander Bilt, 1997; Volberg, 1994; Walker, 1992). Questions were also raised about the reliability and validity of the SOGS and other measures derived from it when used with different subgroups (e.g. women and youth) and in different cultures. The assumption of pathological gambling that underlay the original SOGS, namely that it was a lifelong condition, was also challenged (Abbott & Volberg, 1991; Dickerson, 1993a; Walker, 1992). However, as noted above, this assumption is also inherent in the DSM-III and subsequent DSM definitions of pathological gambling. The SOGS-R was in large part developed to allow a differentiation to be made between people who had ever experienced gambling-related problems and those who currently experience problems (Abbott & Volberg, 1991; 1996a).

Since the advent of the DSM-IV, a number of new measures of problem and probable pathological gambling have been developed. In part these measures have been designed as a result of perceived shortcomings in the SOGS and SOGS-R. They also reflect a concern to have screening instruments based more directly on the most recent and current edition of DSM pathological gambling diagnostic criteria.

Despite the recent proliferation of measures of problem gambling, including at least five based on DSM-IV criteria, in contrast to the SOGS and SOGS-R, the psychometric properties of these tools have yet to be fully examined. None of them has, to date, been adequately assessed for their differential performance in clinical settings, programme evaluation or survey research (Abbott & Volberg, 1999). A further concern is that only a few studies have used the new measures alongside the SOGS or SOGS-R. Although these studies generally obtained high correlation between one of the new measures, namely the Fisher DSM Screen, and the SOGS-R (suggesting that they are measuring essentially the same thing) a great deal more investigation of this type is required. Without this calibration of different measures, it will not be possible to link research that incorporates these new instruments with the large international body of SOGS and SOGS-R based research.

Although they identified a number of deficiencies in problem gambling prevalence studies, Shaffer, Hall and Vander Bilt (1997) concluded that problem gambling is a "robust phenomenon" in that broadly consistent findings have emerged from North American studies undertaken by a variety of investigators using different measures of varying quality. Abbott and Volberg (1999) have recently concluded that Shaffer et al's conclusion also holds for the wider international prevalence literature.

Figure 3 summarises Abbott and Volberg's (1999) conceptualisation of problem gambling. This is an elaboration of a framework developed by Shaffer, Hall and Vander Bilt (1997) for the purpose of conducting a meta-analysis of North American prevalence studies. The model outlined makes clearer the temporal sequence of problem gambling development and change. It rests on the assumption that people can move in either direction along problem gambling severity continua. Not all of the categories indicated in Figure 3 can be assessed by current diagnostic or screening devices and the allocation of people to some of them requires longitudinal investigation and repeat assessment.

**Figure 3: Classification of Problem Gambling**

| <b>Shaffer, Hall &amp; Vander Bilt (1997) Levels</b>                          | <b>Abbott &amp; Volberg (1999) Framework</b>  | <b>SOGS/SOGS-R DSM-IV score</b>  |
|---|---|----------------------------------|
| <b>Level One</b>  | <b>Non-gambler or Non problem Gambler<sup>1</sup></b>   |                                  |
| Represents the proportion of the population that does not experience problems | NG Never gambled  |                                  |
|   | NP1 Non–problem gambler currently and in past   | 0-2 current<br>0-2 lifetime      |
|   | NP2 Non-problem gambler currently but a problem gambler in the past   | 0-2 current<br>3-4 lifetime      |
|   | NP3 Non-problem gambler currently but a probable pathological gambler in the past                               | 0-2 current<br>5+ lifetime       |
| <b>Level Two</b>  | <b>Problem gambler</b>  |                                  |
| Represents gamblers with sub-clinical levels of gambling problems             | PG1 Problem gambler currently but not in the past <sup>2</sup>  | 3-4 current<br>0-2 lifetime      |
|   | PG2 Problem gambler currently and a problem gambler in the past <sup>2</sup>                                    | 3-4 current<br>3-4 lifetime      |
|   | PG3 Problem gambler currently and a probable pathological gambler in the past                                   | 3-4 current<br>5+ lifetime       |
| <b>Level Three<sup>3</sup></b>  | <b>Probable Pathological Gambler</b>  |                                  |
| Represents the most severe form of disordered gambling                        | PPG1 Probable pathological gambler currently but not in the past <sup>2</sup>                                   | 5+ current<br>0-4 lifetime       |
|   | PPG2 Probable pathological gambler currently and in the past <sup>2</sup>                                       | 5+ current<br>5+ lifetime        |
|   | PathG Pathological gambler diagnosed as a pathological gambler by a clinician using current diagnostic criteria | 5+ current<br>and/or<br>lifetime |

**Note**

<sup>1</sup> All categories can also be subdivided into those where the respondent states that he or she has a gambling problem and those who do not.

<sup>2</sup> Separation of these categories requires longitudinal study with repeated assessments or the development of a questionnaire or interview schedule that allows past or 'lifetime' assessment independently of current state.

<sup>3</sup> Following Shafer, Hall and Vander Bilt (1997), a further subdivision of Level Three or a fourth level may be added for people who would seek treatment for gambling problems if it were available.

## 2.5 Deriving Prevalence Estimates from Surveys using Problem Gambling Measures

The great majority of problem gambling surveys have been primarily concerned with estimating how many people there are in the community who are experiencing serious gambling-related problems. This involves selecting a large representative sample from the population of interest, typically a city or region, and administering a questionnaire or conducting clinical interviews that can be demonstrated to be reliable and valid for this purpose. While this sounds straightforward, in practice it is very difficult to accomplish for both cost and a variety of technical reasons (Abbott & Volberg, 1999; Shaffer, Hall and Vander Bilt, 1997). No epidemiological study of any physical or mental disorder is likely to fully meet all of the criteria that would define the ideal survey. In the case of problem gambling surveys, most fall well short of this ideal (Shaffer, Hall & Vander Bilt, 1997).

Classification errors are ubiquitous in prevalence surveys and are particularly problematic when screening measures are used as a proxy for more definitive diagnostic procedures. One way of dealing with this is to follow the screening test with a more detailed clinical and/or laboratory examination. Although widely advocated, this two-phase approach is relatively rare and, to date, only one such study has been undertaken with respect to problem gambling (Abbott & Volberg, 1992; 1996a). In contrast to the situation with most physical disorders, in the case of mental disorders and behavioural problems there is usually no definitive objective measure of the condition that is being investigated. Instead, a clinical diagnosis can be used, although as Shaffer, Hall & Vander Bilt (1997) and others have argued, a clinical assessment is not necessarily a 'better' or more definitive measure than the questionnaire that is being 'validated.'

Misclassification can occur when a person without the problem in question is misdiagnosed as having it. This type of classification error is referred to as a false positive. Misclassification can also occur when the person with the problem is misdiagnosed as not having it. This type of classification error is referred to as a false negative. In clinical situations where they were originally developed, most screening tests usually make relatively few errors of either type. In the case of mental disorders, in clinical settings the great majority of people classified as suffering from a particular disorder are subsequently deemed to warrant this diagnosis when it is independently checked by a clinician. However, when used in community settings where the disorder of interest is much less common, classification errors increase markedly (Dohrenwend, 1995).

In clinical contexts, false positives are not generally a problem when screening tests are followed by more detailed investigation. In this situation, while extra cost is involved in undertaking the additional follow-up examinations, people who were incorrectly diagnosed as having the problem have a high probability of being screened out subsequently, prior to the commencement of treatment. False negatives, on the other hand, are not usually reassessed. If the condition is serious or potentially fatal, this type of classification error could have important adverse consequences. Consequently, while it is desirable to reduce false positives to avoid the expense and inconvenience of unnecessary clinical assessment, it is usually more important to ensure that there are few, ideally no, false negatives.

In community prevalence research, where the primary concern is to accurately identify the number of people with and without a particular disorder, both false positives and false negatives are important because each has an independent impact on the accuracy of the screen. While some commentators (e.g. Walker, 1992) consider false positives to be particularly problematic in population surveys, false negatives can in fact be of primary concern. False negatives are relevant to prevalence estimation because given that by far the majority of the population does not suffer from the disorder, even a very low rate of false negatives can have a large effect on the overall efficiency (i.e. the total proportion of

individuals identified by a screening instrument who are correctly classified). This is illustrated in Table 1.

Table 1 gives an example of a group of 1,000 individuals, of whom five percent are classified as pathological and 95 percent are classified as non-pathological. If it is assumed that the rate of false positives is 25 percent (this level is not unusual in prevalence surveys), then 12 of the 50 true pathological gamblers are misclassified (Abbott & Volberg, 1999). Even if the rate of false negatives is much lower, let us say five percent, 47 of the 950 true non-pathological gamblers will be misclassified. Thus, even a very low rate of false negatives will generate a group that is nearly four times the size of the group of false positives. In this situation, prevalence estimates based on the screening test alone would seriously underestimate the actual prevalence of pathological gambling within the population studied.

**Table 1: The Effect of Different Types of Classification Errors**

| Classification   | Condition      |                  | Total |
|------------------|----------------|------------------|-------|
|                  | Pathological   | Non-pathological |       |
| Pathological     | True Positive  | False Positive   |       |
|                  | 38             | 12               | 50    |
| Non-pathological | False Negative | True Negative    |       |
|                  | 47             | 903              | 950   |
| Total            | 85             | 915              | 1,000 |

Apart from the 1991 New Zealand national survey that gave some indication of likely false positive and false negative rates for the SOGS-R when used in a community setting, no other studies of this type have been reported for problem gambling screens. Consequently, as mentioned earlier, it is unclear how accurately any of the population estimates cited in the literature reflect the true prevalence of pathological gambling. This is a serious shortcoming of problem gambling surveys undertaken to date.

## 2.6 The New Zealand Validation of the SOGS-R

The 1991 New Zealand national study provided an opportunity to examine the diagnostic accuracy of the SOGS lifetime measure and new SOGS-R in a general population survey (Abbott & Volberg, 1992; 1996a). As indicated, this was possible because of the two-phase (double sampling) design where selected phase one respondents who had been assessed with the SOGS-R were subsequently reclassified on the basis of interviewer assessments using DSM-III-R criteria.

‘True’ (interviewer assessed) pathological gamblers were identified in each of four groups selected from phase one respondents, namely (1) lifetime probable pathological gamblers, (2) lifetime problem gamblers, (3) regular continuous gamblers and (4) regular non-continuous gamblers. Respondents who did not score as problem or probable pathological gamblers and who did not report gambling weekly or more were not re-assessed. In refining the

prevalence estimates, it was conservatively assumed that there were no 'true' pathological gamblers in this latter segment of the population.

The New Zealand investigators concluded that the lifetime SOGS-R is very good at detecting pathological gambling among those who currently experience the disorder. There were very few false negatives. However, as expected, the screen identifies problem gamblers at the expense of generating a substantial number of false positives. The current SOGS-R, on the other hand, produces fewer false positives and provides a weaker screen for identifying pathological gamblers. However, its greater efficiency (i.e. it produces fewer classification errors overall) and the fact that it is a current measure, makes it a potentially more useful measure for detecting rates of change in the prevalence of problem gambling over time.

The current SOGS-R was found have a false negative rate of 52 percent, much higher than its false positive rate of eight percent. This means that, as with the hypothetical illustration outlined in Table 1, this measure is likely to provide conservative prevalence estimates when used in general population research. Abbott and Volberg (1992; 1996a) used the information obtained from phase two to revise the phase one current probable pathological gambling prevalence estimate. This revision, based on the efficiency approach, resulted in a current estimate that was almost identical to the 'uncorrected' rate. However, Gambino (in press) has recently demonstrated that this revised calculation did not take account of the complexities of sampling on the basis of first stage screening results. Taking these complexities into account and correcting for the resultant bias, Gambino re-calculated the current pathological gambling prevalence as 6.4 percent, substantially higher than Abbott and Volbergs' (1992; 1996a) estimate of 1.2 percent.

If the revised New Zealand findings are valid, this suggests that all current estimates to date based on the SOGS-R and possibly other screening instruments, may significantly underestimate the prevalence of serious gambling problems within the general population. However, caution is necessary with respect to this aspect of the 1991 study. Although the interviewers in the New Zealand study used DSM-III-R diagnostic criteria and collected life history information concerning gambling and problem gambling, they were not trained clinicians. Furthermore, the reliability of their assessments was not formally evaluated. Consequently, it is possible that their assessments were no more accurate than those obtained from the SOGS-R. If this were the case, the revised estimate based on the additional phase two assessments would not necessarily provide an improvement on the original prevalence estimate. This issue is discussed more fully in Abbott and Volberg (in press).

Another aspect of the 1991 SOGS-R validation should also be considered in the present context. In the case of the current SOGS-R, one could question the appropriateness of using DSM-III-R 'diagnoses' as the criterion measure. As mentioned above, such diagnoses (more properly referred to as 'assessments' when arrived at by lay interviewers) are lifetime measures. While appropriate as a criterion for lifetime SOGS or SOGS-R performance, it could be argued that in the case of the current SOGS-R measure, the clinical assessment should have a similar six or 12 month timeframe. However, as mentioned previously, formal psychiatric diagnoses of pathological gambling do not provide for this possibility as the disorder is construed as chronic or 'relapsing' in nature.

Further research is required to determine how the SOGS-R and other measures relate to clinical diagnoses in community samples. The present study will provide some information relevant to this issue in that a number of the interviewer-assessed 'true' pathological gamblers have been re-assessed seven years later and can be compared with groups of regular and problem gamblers identified in other ways. The second phase of the Swedish national survey addresses this matter more directly. This phase includes clinical interviews conducted by psychologists and other health professionals. Phase one of this survey is reported in Rönnberg, Volberg and Abbott et al (1999).



## 2.7 General Population Surveys of Problem Gambling

Reference has been made to community surveys of probable pathological and problem gambling. The majority of these have been at state or provincial rather than at a national level. Most have been conducted in the United States, Canada, Australia, New Zealand and Spain (Abbott & Volberg, 1999). Prior to 1991, study was confined to lifetime measures of problem and probable pathological gambling. Following the development of the SOGS-R, most prevalence surveys have included both lifetime and current (predominantly 12 month) measures.

While the main concern of community surveys of problem gambling has been to establish prevalence estimates of problem and probable pathological gambling, most have also been interested in measuring various aspects of gambling participation and expenditure and in identifying risk factors for problem gambling.

Apart from one very high estimate from an Australian study (albeit comparable with Gambino's recalculated New Zealand figure), there is a high level of consistency in the findings of prevalence studies using the SOGS, SOGS-R and related measures. In various countries and regions within countries, prevalence estimates for current probable pathological gambling have varied between 0.5 to 2.8 percent (Abbott & Volberg, 1999). Lifetime estimates are approximately double those of current estimates. Although Shaffer, Hall and Vander Bilt (1997) concluded that these estimates do not vary appreciably across measures or across different investigators in North America, it does appear that the more recent DSM-IV based measures generate somewhat lower estimates.

Problem gambling prevalence seems to broadly mirror the rankings of countries in terms of their gambling participation and expenditure (Walker & Dickerson, 1996), although this requires more detailed examination with careful consideration of the expenditure definitions. In North America, where a larger number of studies have been carried out over a longer period of time than in other parts of the world and where replication studies have been undertaken, there are indications of an increase in prevalence over time. The issue of differences both across societies and over time, with respect to relationships between gambling participation and changes in problem gambling prevalence, requires further investigation. It is probable that consideration of changing patterns of relationships between involvement in particular forms of gambling and problem rates will be more productive than focussing on aggregate gambling and expenditure data.

Adolescent, indigenous people and residential (prison, substance dependence and psychiatric in-patient) surveys have generally yielded probable pathological and problem gambling prevalence estimates that are two to four times higher than those obtained from general adult population surveys (Abbott & Volberg, 1999; Shaffer, Hall & Vander Bilt, 1997).

Factors consistently associated with higher problem gambling prevalence in the North American surveys include being male, young, in college, having a history of antisocial behaviour and experiencing psychiatric co-morbidity. In some studies, including those undertaken in Australia and New Zealand, the following have been identified as further risk factors:

- Commencing gambling at a young age
- Reports of parental gambling problems
- Regular participation in 'continuous' forms of gambling such as gaming machines and track betting
- Unemployed status
- Lower educational level

- Membership of a marginalised ethnic group (e.g. Native Americans in the United States; Māori and Pacific Islanders in New Zealand).

Given that many of the predictor variables listed above are inter-related, it would be advisable for future studies to include multivariate analyses to examine these relationships and clarify the relative predictive and explanatory capability of the various risk factors. For example, how much of the relationship between young age and problem gambling is due to employment status and regular participation in certain forms of gambling rather than age per se?

There appears to be only one study in the scientific literature on the incidence of problem gambling (Cottler, 1998). This study was limited to a small sample of people who had reported using an illicit drug at least five times. Like the present study, the sample was drawn from the general population. The other studies referred to above are concerned with prevalence. Prevalence refers to the number of cases of a particular disorder existing in the population at a given point in time, e.g. during the past 12 months. Incidence refers to the number of new cases that arise over a given time period. The determination of incidence requires prospective studies of large cohorts within the general population. This type of investigation also enables risk factors for the onset of problem gambling to be delineated with much greater precision than has been possible with the cross sectional prevalence studies undertaken to date.

Prospective (longitudinal) studies also allow the 'natural history' of different patterns of high risk and problem gambling to be delineated, both within the general population and in different subgroups. In contrast to alcohol dependence and some other mental disorders, very little is known about the development and change of problem gambling patterns within individuals over time.

## 2.8 New Zealand Gambling Participation and Problem Gambling Surveys

### Introduction

During the 1970s and most of the 1980s, legal gambling in New Zealand was largely confined to on- and off-course betting on horse and dog races and the state lottery, Golden Kiwi. Significant numbers of people also engaged in housie (bingo), charitable raffles and 'casino' evenings, prize competitions and a variety of other minor forms of gambling, both legal and illegal. Most expenditure, probably 70 to 80 percent, went on track betting. Golden Kiwi and the remaining miscellaneous group accounted for the remainder. Throughout this period, legal gambling expenditure remained fairly constant, in most years making up slightly less than one percent of total household expenditure (Department of Internal Affairs, 1990).

Lotto was introduced in 1987. Gaming machines were legalised in hotels and clubs during 1988 although, at the time of their legalisation, approximately 8,000 were already operating (Department of Internal Affairs, 1995a; 1995b). In 1989, Instant Kiwi (an instant scratch lottery) was added. The introduction of these new forms of gambling resulted in a sharp rise in gambling expenditure. From 1987 to 1990 expenditure increased by slightly more than 100 percent and during the 1989/1990 year accounted for 1.5 percent of household expenditure (Department of Internal Affairs, 1995b).

Since 1990, further forms of gambling have been introduced and gambling expenditure has increased steadily. These 1990s developments are summarised below, following description and discussion of the 1991 National Survey of Problem and Probable Pathological Gambling.

## Gambling Participation Surveys

The Department of Internal Affairs (DIA) conducted national surveys of adult gambling participation and attitudes towards gambling in 1985, 1990 and 1995 (Wither, 1987; Christoffel, 1992; Reid & Searle, 1996). Given the similarities in methodology and content, the major findings of these surveys will be presented together.

In 1985, 85 percent of respondents indicated that they had participated in at least one form of gambling during the 12 months prior to the survey. In both 1990 and 1995, 90 percent reported having participated within this timeframe. This level of participation is high by international standards. The average number of different gambling activities engaged in by each participant also increased from 1985 to 1990 and held at the 1990 level in 1995.

Males and females reported similar past year participation levels. Older respondents, especially those aged 65 years or more, reported lower participation rates. Māori and Roman Catholics, relative to other ethnic and religious groups, had higher levels of participation. In the 1990 survey, retired people had the highest non-participation rates. In 1995, students and beneficiaries had the highest non-participation rates, although retired people and those engaged in “home duties” were over-represented among those participating in only one to three gambling activities.

In 1985, reported past 12 month participation was highest for raffles and lottery tickets (71%) and remained high in 1990 (62%) and 1995 (67%). Lotto, which was introduced in 1987, displaced raffles in 1990 (78%) and 1995 (80%) as the top ranking form of gambling. Track betting was the second ranking activity in 1985 (25%) and was engaged in by similar numbers (23%) in both 1990 and 1995. However, while engaged in at similar rates across the three surveys, the relative ranking of track betting fell to fifth equal in 1990 and sixth in 1995. This relative decline was largely due to the popularity of new forms of gambling, namely Instant Kiwi and other instant lotteries (66% in 1990; 58% in 1995) and gaming machines outside of casinos (28%; 24%). Informal betting with friends and others (1985, 19%; 1990, 23% and 1995, 30%) also played a role. Just prior to the 1995 survey, some additional forms of gambling were introduced including Daily Keno and the Christchurch casino. There were relatively low levels of participation in these activities.

The 1990 and 1995 DIA survey reports included considerable information on gambling expenditure. In 1990, reported mean (average) respondent expenditure was \$446 and in 1995 \$413. In 1995, the reported figure was approximately half the New Zealand adult per capita gambling turnover for the comparable time period. In both 1990 and 1995, nearly half of the respondents reported spending less than \$100. It was only in the highest expenditure category that appreciable changes took place. In 1990, 16 percent reported spending more than \$500. In 1995, the number increased to 22 percent. In contrast to the self reported survey findings, ‘actual’ gambling turnover and net expenditure increased appreciably from 1990 to 1995. It is not known why this increase was not reflected in the survey estimates.

In contrast to past year participation rates, there were gender differences in gambling expenditure. In both surveys women reported spending, on average, approximately two-thirds that of men. Māori spent significantly more than non-Māori although this difference reduced somewhat in 1995. The oldest age group (65 years and older) reported lower expenditure than other age categories in 1990 and 1995. However, in 1995, the youngest (15-24 years) group also reported low expenditure. A somewhat similar pattern applied for beneficiaries and lower occupational status workers. In 1990, these two groups had appreciably higher expenditure than other occupational groups, even when no adjustment was made for their lower incomes. However, in 1995, the mean expenditure of both groups dropped appreciably, although they still remained in the top three of the six expenditure groups. Respondents without formal educational qualifications also spent considerably more than other educational groups in 1990. In 1995, while their average expenditure dropped from \$675 to \$532, this group retained its top expenditure ranking.

Religion was only considered in relation to gambling participation and expenditure in the 1990 survey. The expenditure findings paralleled gambling participation. Roman Catholics reported spending double that of the other religious groups.

Substantial differences in reported expenditure on particular forms of gambling were found between some sociodemographic groups. An overview of the findings is provided in Abbott and Volberg (1999). Consideration here is confined to two forms of gambling that have been shown in previous studies to have a strong relationship with problem gambling, namely track betting and gaming machines.

Track betting expenditure was much higher for men than women in both surveys. Māori, people on higher incomes, employed people and those aged between 25 and 64 years also reported higher expenditure on this form of gambling.

In both 1990 and 1995, men also reported higher expenditure than women on gaming machines. In contrast to track betting, non-Māori spent more on machines. In 1990, the youngest group reported the highest expenditure, approximately double that of any other age group. However, this was reversed five years later, with the youngest group reporting the lowest expenditure and the oldest group the highest expenditure. A somewhat similar finding applied to income and educational level. In 1990, those on high incomes reported the lowest expenditure. In 1995, this group reported expenditure three times higher than that of any other group. With respect to education, in 1990 people without formal education had the highest level but in 1995 this group's expenditure was similar to that of university graduates, the lowest spending group. Similarly, in 1990, beneficiaries had by far the highest expenditure of the various occupational groups. In 1995 they ranked third after retired respondents and those in the upper occupational groups. These findings suggest a substantial change in the sociodemographic expenditure profile of gaming machine players. However, given the small samples involved, the findings should be treated with some caution.

Apart from the DIA surveys, two other relevant national surveys were conducted during the 1990s, namely the 1991 National Survey of Problem and Pathological Gambling (Abbott & Volberg, 1991; 1992; 1996a) and the North Health Survey (North Health, 1996). Both were primarily concerned with problem gambling but also examined gambling participation. A further survey of Auckland and Christchurch samples also has some relevance to the present study (Australian Institute for Gambling Research, 1998).

The 1991 national survey was referred to above with respect to the development and validation of the SOGS-R. Methodological details of the 1991 National Survey will be outlined later in this report. The gambling participation findings of this study were generally consistent with those from the 1990 DIA survey, despite the former being administered by telephone and the DIA surveys being conducted face-to-face. The 1991 study had a much larger sample than the other studies which allowed some subgroups to be examined in more detail, e.g. Pacific Islanders and unemployed people.

Ninety-five percent of respondents said that they had gambled at some time in their lives, 90 percent in the past six months. This finding is similar to that of the 1990 DIA survey where 90 percent said they had gambled within the past 12 months.

Pacific Island respondents reported high levels of participation relative to other ethnic groups in Lotto, Instant Kiwi and track betting. Unemployed people also reported very high levels of participation in Instant Kiwi and somewhat higher participation rates for track betting and gaming machines.

Although different methods were used to measure reported gambling expenditure in the 1991 and DIA surveys, similar results were obtained. The 1991 national survey annual reported expenditure was \$444 per person, virtually identical to the 1990 DIA figure of \$446.

Christoffel (1992) compared the 1990 DIA and 1991 National Survey expenditure data for each of the major forms of gambling. As with gambling participation, the general pattern of results was similar although the DIA estimates were somewhat higher for many activities.

Although overall lifetime and recent gambling participation differences between men and women were relatively small in both the 1991 and 1990 DIA surveys, men particularly young men, were more likely to engage in gambling activities on a regular basis. Men also reported spending twice as much per month as women in the 1991 survey, a greater difference than was found in the 1990 DIA survey. Men were much more likely than women to bet on track events and play gaming machines and cards for money. Although somewhat more men than women regularly purchased Lotto tickets, approximately half of total female reported gambling expenditure went on this form of gambling. Lotto accounted for just over a quarter of male reported expenditure.

Apart from the youngest age group (which reported spending most in the 1991 survey) and the oldest group (which spent least), age appeared to have little relationship with overall gambling expenditure. In the 1991 survey, Māori were not over-represented with respect to participation in the major forms of gambling. However, as in the 1990 DIA survey, they had higher average gambling expenditure. Of the ethnic groups considered in the 1991 survey, Pacific Islanders reported the highest expenditure. Unemployed respondents and Roman Catholics also reported high expenditure.

1991 National Survey phase two participants included phase one SOGS-R defined lifetime problem and probable pathological gamblers (samples of 52 and 65 respectively) and regular (weekly or more) continuous and non-continuous gamblers (samples of 50 in each group).

Phase two respondents were asked if they could recall seeing or hearing advertisements for any sort of gambling. Almost 90 percent recalled Lotto advertising, followed in descending order of frequency by Instant Kiwi, horse racing/TAB, lotteries and raffles. There were no appreciable differences between the four sub-samples although the interviewer identified 'pathological gamblers' had somewhat different patterns of recall compared with the other phase two respondents.

Respondents were asked to indicate, unprompted, their preferred type of gambling. The majority (70%) of regular non-continuous gamblers mentioned Lotto. Interestingly, this was also the most frequently reported (42%) preference for continuous gamblers. Twenty percent of continuous gamblers nominated track betting, 14 percent Instant Kiwi, six percent housie and six percent gaming machines. The non-continuous gamblers were much less likely to cite one of these forms of continuous gambling as their first preference.

As indicated, many (44%) regular continuous gamblers actually reported a non-continuous form as their preferred mode. In most cases they also engaged in non-continuous forms of gambling on a weekly or more often basis. Similarly, some (18%) of the regular non-continuous gamblers preferred a continuous form although, because of the way the sub-samples were defined and selected, they engaged in these forms less than once a week.

Ninety-eight percent of non-continuous gamblers and 80 percent of continuous gamblers said that they frequently participated in Lotto. Continuous gamblers also reported frequent participation in other lotteries/raffles (38%), football pools (19%) and bets with friends (10%). Similar percentages of non-continuous gamblers indicated frequent participation in these non-continuous types of gambling. In other words, apart from different frequencies of involvement in Lotto, the two sub-samples of regular gamblers had similar patterns of involvement in other non-continuous forms.

The continuous gamblers, however, reported much higher levels of participation than their non-continuous counterparts in all other forms of continuous gambling such as Instant Kiwi, track betting, gaming machines, scratch tickets and card games. The continuous group also generally reported spending more time and money on most forms of gambling, including the non-continuous forms.

Continuous gamblers were more likely than non-continuous gamblers to say that their gambling was a hobby or that they gambled to socialise. They were less likely to say they gambled for excitement or challenge. Continuous gamblers were also more likely to report having started gambling before the age of 18 years.

Phase two respondents were asked to describe their gambling participation following various major life stage transitions, namely leaving school, marriage/de facto relationship, the arrival of children and leaving work (retirement or unemployment). Leaving school appeared to be associated with a net increase. The other transitions, especially the arrival of children, were followed by net decreases.

Participation levels in particular forms of gambling also varied across life stage transitions. Track betting, bets with friends and purchasing lottery or raffle tickets, for example, were less frequent following retirement or unemployment. However, Lotto, Instant Kiwi and perhaps gaming machine participation appeared to be higher in these circumstances. Average time spent gambling per session was also reported to have decreased following retirement or unemployment.

While these accounts of changes in gambling patterns over time are of interest and potential significance, they are retrospective. The information provided may have been distorted owing to recall deficiencies and retrospective interpretation. In the present situation, these accounts and their interpretation are also confounded because the respondents were of varying ages and generational or cohort effects are likely to be present. Prospective longitudinal study is required to separate out this form of confounding, as well as to reduce recall problems.

Phase two respondents were also administered questions concerning perceived benefits and adverse consequences of gambling participation. These questions were grouped under the following headings: personal, interpersonal/family, vocation/employment, financial, legal and gambling characteristics. Over half of the respondents who were not assessed by the interviewers as being pathological gamblers reported that at some time "my gambling has given me pleasure and fun" and "I have daydreamed about getting a big win". Over 40 percent indicated that "gambling has been a hobby and interest to me", "gambling is something we all talk about at work" and "when I was gambling I felt excited".

The 1996 North Health Survey (North Health, 1996) found a similar level of lifetime gambling participation to the 1991 National Survey (92%). But, other than for Lotto, the other major types of gambling had much lower lifetime participation rates. Past six months rates were also generally lower than the past 12 months rates reported in the 1995 DIA survey. Reported overall mean monthly gambling expenditure, on the other hand, was similar to that found in these other surveys. So too was reported expenditure for regular gamblers. The 1996 participation and expenditure findings were inconsistent with the substantial growth that had taken place in gambling availability and official expenditure information. The report authors concluded that their survey sample was biased and that other methodological shortcomings reduced the confidence that could be placed in the survey findings. Although the response rate was low and Māori and Pacific Islanders were significantly under-represented, the overall quality of this study appears to be comparable with that of many other problem gambling surveys conducted internationally.

The 1997 Australian Institute for Gambling Research (1998) survey involved telephone interviews with randomly selected respondents in Christchurch and Auckland. The questionnaire used in this survey was modelled on that used in the 1995 DIA survey to facilitate comparison.

Past 12 months participation rates (90% for Auckland; 95% for Christchurch) were similar to those of the previous New Zealand surveys conducted during the 1990s and 41 percent reported participating in four or more activities during this period. Again this is similar to what was reported in the DIA 1990 and 1995 surveys. As in 1995, Lotto (77% Auckland; 78% Christchurch), raffles (73%; 82%) and Instant Kiwi (40%; 54%) were the activities in which

most people reported participating during the past 12 months. Participation rates were higher for gaming machines outside casinos than was found in 1995 and lower for housie.

The 1997 survey found much higher overall expenditure levels than was evident in the 1990, 1991 and 1995 national surveys. In 1995, mean annual reported gambling expenditure was \$413 per respondent and the median \$145. The corresponding estimates from the 1997 survey were \$2,355 and \$299 for Auckland respondents and \$970 and \$301 for Christchurch respondents. The overall mean for Auckland and Christchurch was \$1,794, more than three times the 1995 national estimate. In 1995, although South Island expenditure was somewhat lower than the two North Island 'regions', differences between the three areas were modest.

Approximately 15 percent of respondents said they gambled at a casino more than once a month. Although Christchurch residents said they visited casinos more often than Aucklanders, they reported spending substantially less per visit, especially on table games.

Pacific Islanders, Māori and Asians in Auckland reported higher levels of expenditure than other ethnic groups. Gender differences were greater than in previous New Zealand studies and age differences, while similar to the pattern found in 1995, were greatly amplified.

The authors of the AIGR report concluded that the introduction of casinos to Auckland and Christchurch has had a substantial impact on gambling patterns and expenditure in these cities. However, very little detail is provided on the survey methodology and response rates are not given. This combined with the small sample size (600 in Auckland; 400 in Christchurch) necessitates caution, especially with respect to the confidence that can be placed in comparisons between many of the smaller sub-groupings.

## **Problem Gambling Surveys**

New Zealand was among the first countries to undertake community surveys of problem gambling. Apart from the current 1999 study, three general population problem gambling surveys have been conducted.

As mentioned earlier, the pathological gambling section of the DIS was included in a general psychiatric epidemiological study conducted in Christchurch during 1986. It was concluded that 3.6 percent of Christchurch adults had experienced a problem with gambling at some stage during their lives and that 0.4 percent were pathological gamblers. Although the methodology of this survey was generally sound and obtained a satisfactory response rate, the estimates of pathological gambling were based on only a few questions and the time frame was not given for two of the seven pathological gambler 'cases'. As mentioned previously, the DIS pathological gambling measure used in this survey has not been adequately validated.

Aspects of the 1991 National Survey of Problem and Pathological Gambling have already been described. Here, attention is confined to some of the major findings concerning problem and pathological gambling.

From phase one of the 1991 survey, it was estimated that the current SOGS-R defined probable pathological gambling prevalence was 1.2 percent (0.9; 1.5% confidence interval) and that the current problem gambling prevalence was 2.1 percent (1.7; 2.5%). Corresponding lifetime estimates were 2.7 percent (2.2; 3.2%) and 4.2 percent (3.6; 4.8%). These estimates were derived in the same way that has been employed in the great majority of gambling prevalence studies internationally. Consequently, they can be compared with findings from these studies. Abbott and Volberg (in press) have since argued that consideration should be given to the sample complexities of these studies, including that of their 1991 survey. While prevalence estimates should not be altered as a consequence of sample complexity, they maintain that the confidence intervals applying to these estimates

are typically wider than stated in survey reports. In the case of low prevalence estimates, they are also likely to be skewed (Abbott & Volberg, in press).

As indicated in section 2.6, from information that was available as a consequence of the two-phase design used in the 1991 study, the authors attempted to refine their prevalence estimates. They initially concluded that the current prevalence and confidence interval had been confirmed and that the lifetime prevalence estimate probably fell between 0.3 and 3.7 percent. These adjustments have since been challenged (see Abbott & Volberg, in press and Gambino, in press). It remains unclear whether or not the phase two information can be validly used to refine the original point estimates.

Two percent of phase one respondents said that they felt that they had had a problem with gambling at some time, one percent within the six months prior to being interviewed. These percentages are similar to the percentages identified by the SOGS-R as being probable pathological gamblers, but about a third of the combined SOGS-R problem and probable pathological gambling groups.

Most people who were classified as having experienced serious gambling-related problems at some stage in their lives were found to currently have problems. While this suggests chronicity for the majority, it also suggests that a significant minority overcame or reduced their gambling problems.

Approximately half of the interviewer assessed 'pathological gamblers' and eight percent of the other phase two respondents indicated that they considered that they had personally had a gambling problem at some time. However, none of the 'pathological gamblers' or any of the other phase two respondents in this situation had ever sought or received professional treatment for problem gambling.

The findings mentioned in the last two paragraphs raise questions about the stability of problem and pathological gambling over time as well as about factors other than treatment that may account for any changes. This is an important issue both in terms of furthering our understanding of problem gambling and in estimating wider economic and social costs from problem gambling prevalence surveys. It is one of the matters that is considered further in the present longitudinal study.

A great deal of information regarding problem and probable pathological gambling is provided in the various reports on phases one and two of the 1991 national survey (Abbott & Volberg, 1991; 1992; 1996a; Volberg & Abbott, 1994; 1997). Some of the findings concerning risk factors for problem gambling were summarised earlier. Ethnicity and age were mentioned in this regard. To be more specific, more than half of the 1991 problem and probable pathological gamblers were of Māori or Pacific Islander ethnicity and half were aged under 30 years. Relatively more of the current probable pathological gamblers were in the youngest age category. This could mean that there had been a significant increase in gambling problems during the few years prior to the survey. The younger group of probable pathological gamblers appeared to differ from their older counterparts in a variety of ways, for example they reported starting gambling at an earlier age and generally preferred gaming machines. Their problems also appear to have developed more rapidly. Male gender, unemployment and a reported history of parental gambling problems were further major risk factors identified in the 1991 study.

Another aspect of the survey findings concerned co-morbidity. A strong association was found between problem gambling and alcohol-related problems. Over 60 percent of probable pathological gamblers were identified as currently engaging in hazardous alcohol use compared to 19 percent in the non-problem group. Somewhat weaker but significant associations were found between problem gambling and both depressive symptoms and psychiatric disturbance as measured by the General Health Questionnaire. These associations were stronger for the interviewer assessed 'pathological gamblers' and SOGS-R defined probable pathological gamblers than for problem gamblers.



Both interviewer-assessed 'pathological gamblers' and probable pathological gamblers were more likely than other respondent groups to participate frequently in continuous forms of gambling, especially track betting, gaming machine play and taking money bets with friends. They were also more likely to indicate that their gambling was beyond their control, e.g. "it's like a drug," "I'm hooked," "it's born in me." These participants reported most frequently taking part in gambling activities after leaving school and before becoming involved in a significant relationship. However, they indicated that they spent the largest amount per gambling session when they were involved in a significant relationship. This finding, if corroborated by further study, has important implications in terms of likely adverse effects on partners and other family members.

Abbott and Volberg (1992, p. 12) concluded:

Gambling participation and expenditure have increased rapidly since the introduction of new forms of gambling in the late 1980s. It is highly probable that gambling-related problems including pathological gambling have also increased significantly, especially among the groups that are most involved in continuous forms of gambling on a regular basis, namely young men, Māori, Pacific Islanders and the unemployed.

Given the latency period between starting gambling on a regular basis and the development of problems, it is likely that the present study was conducted too soon to capture the full impact of increased gambling participation on the prevalence of problem and pathological gambling within the community. It is expected that there are large numbers of people still in the 'pipeline' who will progress from regular or problem gambling to pathological gambling during the next few years.

The introduction of casinos and other new forms of gambling, as well as the more aggressive marketing of gambling activities, will also contribute to increased participation and very probably to increased prevalence rates.

An alternative hypothesis to that proposed by Abbott and Volberg (1992) is that many young problem gamblers will 'grow out' of their problems. It is also conceivable that as people and society more generally obtain increased experience with the new forms of gambling, adaptations will be made that enable problems to be more readily countered or contained. Increased public awareness of problem gambling and its early warning signs, the development of informal social controls and the expansion of treatment and self-help options, may play a part in this process. Under this more optimistic scenario, the proposed relationship between rising gambling participation and increasing problems may be attenuated or possibly reversed. The 1998-1999 National Gaming Survey has been, in part, designed to explore these various possibilities.

The 1996 North Health Survey has also been described briefly. Some serious methodological shortcomings were noted. The overall SOGS-R current probable pathological gambling prevalence estimate was 0.4 percent. Paradoxically, presumably because of non-representative sampling of Māori and Pacific Islanders, this increased to 0.7 percent when non-Europeans were excluded. Although lower than the 1991 point estimate of 1.2 percent, if calculated to take account of the complex designs used in both studies, the confidence bands pertaining to the 0.7 and 1.2 percent estimates would probably overlap. On the face of it, the North Health results imply that no increase in problem gambling took place from 1991 to 1996. However, the North Health report authors argue that the flaws in their study are such that little confidence can be placed in the data collected.

## **2.9 Post 1991 Developments**

As mentioned above, the 1991 national survey was undertaken primarily to assess the extent of problematic gambling, identify risk factors for problem gambling and gauge the likelihood that people with this type of problem would seek professional help if it was provided. It also

sought to obtain information on self-reported gambling participation and expenditure. Although sub-national studies had been conducted in the United States during the late 1980s, New Zealand was the first country to complete a nation-wide survey of this type. It was also the first to provide both current and lifetime estimates of problem and probable pathological gambling and use a two-phase design. It is from this survey that respondents were selected for re-interview in the present study.

The reports arising from the 1991 New Zealand survey were officially launched in Parliament and provided a focal point for national seminars jointly hosted by the Ministers of Internal Affairs and Health. The survey findings played a part in stimulating the development of services for problem gamblers during the early 1990s. These services included a national hotline, clinics and support for some existing residential facilities. The Lottery Grants Board initially funded these services. Subsequently, funding was provided through the Committee on Problem Gambling Management by way of contributions from major sectors of the gaming industry.

As mentioned earlier in this report, during the 1990s, a large number of further state and provincial problem gambling prevalence studies were conducted, predominantly in Australia, Canada, Spain and the United States (Abbott & Volberg, 1999). This year, three national studies have been completed. These include a second New Zealand survey (Abbott & Volberg, in press) and surveys in Sweden (Rönnerberg, Volberg & Abbott et al, 1999) and the United States (National Opinion Research Center, 1999).

In the late 1990s, the issues surrounding legal gambling have become far more complex than was the case when the 1991 New Zealand survey was undertaken. Rönnerberg, Volberg and Abbott et al (1999) have recently noted:

Policy makers, gambling regulators and gaming operators are concerned about the likely impact of changing mixes of legal gambling on the behavior of broad segments of the population as well as on the prevalence of gambling-related difficulties. Public health researchers and social scientists are concerned with minimizing the risks of legal gambling to particular subgroups in the population. Economists, financial institutions and law enforcement professionals are concerned about relationships between legal gambling and bankruptcies, gambling and crime, and the reliance of gambling industries on problem gamblers for revenues. Treatment professionals, government agencies and not-for-profit organizations are concerned about how to allocate scarce resources for the prevention and treatment of gambling problems (p1).

Gambling research is expanding its scope to address these issues and questions arising from them. In addition, while providing information that was not previously available, the rapidly expanding body of research into gambling and problem gambling has generated further questions that require more fine-grained examination to answer. There is also a concern to bring together previously largely disparate research approaches and attempt to quantify and weigh both the economic and social costs and benefits of different forms of gambling (Gambino, 1997).

In recent years, repeat ('replication') surveys have been completed in a growing number of jurisdictions, with intervals between studies ranging from two to ten years. These surveys provide probes of the population at different times, thus allowing changes in community gambling and problem gambling prevalence to be identified.

Again, to recap, some consistent findings have emerged from problem gambling baseline and replication studies. Examples include the identification of groups at high risk for problem gambling and the forms of gambling activity that are strongly related to problem development. However, relative to more established fields such as alcohol studies, knowledge remains at a rudimentary stage.

In contrast to the situation with alcohol dependence and many other varieties of serious problem behaviour and mental disorder, there have been no longitudinal studies that have

examined changes in problem gambling over time within the same individuals. In addition, most of the community survey research has been correlational, examining relationships between variables measured at a single point in time. There has been little experimental or quasi-experimental investigation where similar groups or communities have been exposed to different levels or mixes of gambling opportunities and compared on relevant measures. One consequence of the lack of research of this type is that while associations between variables can be examined, it is often difficult to establish with any certainty whether or not these associations are causal in nature.

### 3. THE 1998 LONGITUDINAL FOLLOW-UP SURVEY

#### 3.1 Introduction

This component of the NZGS is of particular significance because it involves follow-up and assessment of regular gamblers and problem gamblers who were interviewed in the 1991 national survey, prior to the introduction of new forms of gambling and a significant expansion of gambling expenditure in New Zealand. These new forms of gambling included casinos. Because the study design is prospective, it allows somewhat more rigorous testing of relationships between gambling participation and problem gambling than is possible from research to date that has predominantly employed cross sectional designs and replication surveys.

The Longitudinal Follow-up described in this report allows changes to be examined over time in the same sample of participants. A further unique aspect of the Longitudinal Follow-up is that it enables comparisons to be made both over time and currently between participants who resided in two cities that subsequently introduced casinos with participants from other parts of New Zealand. In other words, to some extent, the study constitutes a natural experiment with respect to assessing the impact of the introduction of casinos to New Zealand.

The longitudinal nature of the study is important because it provides an opportunity to obtain information on how gambling participation changes over time and how gambling problems develop and fluctuate over time within individuals. Very little is known about this in the wider community. The great majority of research to date has considered this matter by studying retrospective accounts from people in treatment. Participants in these studies are not representative of problem gamblers living in the community and their responses to questions are subject to memory and other forms of distortion (Walker, 1992).

As there have been no previous prospective longitudinal prevalence studies of problem gambling, very little is known about the incidence of this disorder, i.e. the number of new cases that arise during a particular period of time. As we have seen, there have been a large number of prevalence studies conducted in various countries, studies that estimate the number of problem gamblers in the population at a given point in time. Both incidence and prevalence data are required to obtain a comprehensive understanding of the epidemiology of problem and pathological gambling. Although constrained by small size and some other features of the sample, the present study provides information germane to this topic.

#### 3.2 The 1991 National Survey

Some of the major findings from this survey were outlined in sections 2.6 and 2.8 and considered in relation to the findings of other relevant research. The aims and methodology of the 1991 survey are described in further detail here because this study forms the base of the 1998 longitudinal follow-up survey.

In phase one of the 1991 survey, 4053 people aged 18 years or older were interviewed by telephone and asked about their involvement in and expenditure on gambling activities. The interview also included a modified version of the South Oaks Gambling Screen (since widely referred to as the SOGS-R), designed to provide a measure of both lifetime and current problem gambling estimates. Phase two involved in-depth, face-to-face interviews with 217 respondents selected from the phase one sample.

The more specific aims of phase one of the 1991 National Survey were to:

- Determine the lifetime and current prevalence rates of problem and pathological gambling in the New Zealand population

- Identify demographic, social and other factors that discriminate between pathological gamblers and other people
- Compare the current participation of the adult population in various types of gambling and the prevalence of problem and pathological gambling with the findings of North American prevalence surveys
- Provide a baseline to enable assessment of future changes in the prevalence of problem and pathological gambling and gambling activities generally, within the adult New Zealand population
- Provide information to assist public policy decisions about the legislation and promotion of new forms of gambling, as well as the provision of services to problem and pathological gamblers.

As outlined in 2.6, phase two incorporated a validation of the SOGS-R in a general population setting to enable a more accurate determination of current prevalence of pathological gambling within New Zealand. Additional aims of phase two included:

- Determining the degree to which frequent, problem and pathological gambling are associated with problems in other spheres of life
- Assessing whether or not participation in certain forms of gambling are more strongly associated with gambling and gambling-related problems
- Describing the developmental history of gambling problems among pathological gamblers
- Examining the type and outcomes of help-seeking behaviour by people who are identified as problem or pathological gamblers.

Detailed findings from phases one and two of the 1991 National Survey are reported in Abbott and Volberg (1991; 1992). An overview and reports on specific aspects of the survey were also published in peer reviewed professional and scientific journals (Abbott & Volberg, 1996a; 1996b; Volberg & Abbott, 1994; 1997). The methodology of the 1991 survey and some of the substantive findings are also examined in the light of more recent developments within the problem gambling literature in Abbott and Volberg (1999).

As discussed previously, at the time of the 1991 National Survey, the range of legal forms of gambling in New Zealand had recently expanded. Following many years of stability, gambling expenditure almost doubled during the period from 1988 to 1990. Total 1990 expenditure on the five major gambling products was estimated at NZ\$557 million (Department of Internal Affairs, 1990).

In this context of rapid change in the New Zealand gambling environment, Government called for a review of the country's gaming legislation and established a Review Committee that reported in late 1990. The review received submissions from a wide variety of organisations and individuals. It also reviewed previous New Zealand gambling research.

The Department of Health's submission to the Review Committee noted that "in recent years, pathological gambling has become recognised as a mental disorder with serious economic and social consequences" (p 15). The Department asserted that this disorder has parallels with alcohol and drug addiction and that the understanding of gambling problems was where the understanding of alcohol dependence was 40 or 50 years ago.

During this period of rapid growth in gambling expenditure, a Committee of Inquiry into Casinos was also receiving submissions and examining relevant documentation. Both the Report of the Committee of Inquiry into Casinos (1989) and the Review Committee (Department of Internal Affairs, 1990) concluded that while problem gambling existed in New Zealand and could be worsened by the expansion of gambling opportunities, there was considerable uncertainty regarding its scale.

While there was a dearth of New Zealand research on problem gambling before 1991 and little by way of specialist treatment for people suffering from pathological gambling, there were indications that members of the wider community had some awareness of the topic. For example, the 1985 Department of Internal Affairs national survey referred to earlier, found that 66 percent of respondents agreed or strongly agreed with the statement that there was a problem with people being heavily involved in gambling. In the Department's 1990 survey the number rose to 71 percent. In 1985, 86 percent agreed or strongly agreed with the statement that people who want to give up gambling should be given special help to do so. In 1990 this percentage increased to 91 (Department of Internal Affairs, 1990).

The Review Committee recommended significant changes to gaming legislation. It also recommended that research should be undertaken to establish the prevalence of problem gambling in New Zealand. The 1991 National Survey arose from this recommendation.

### **3.3 Gambling in New Zealand: Post 1991**

Since 1991, a number of additional forms of gambling have been introduced. These include:

- Daily horse/dog racing and a track-side free to air national television channel combined with facilities for telephone betting
- Hotel/pub TABs
- Urban casinos in the major metropolitan centres in the North and South Island
- Daily Keno
- TeleBingo
- Sports betting
- 0900 telephone 'competitions'.

In addition, the number of gaming machines has steadily risen, along with increased numbers of machines per venue and larger prizes and jackpots. In January 1995 there were 8,303 machines located outside casinos. The number increased to 12,454 by January 1998. The Internet also provides access to a wide variety of gambling activities.

In 1997, national annual legal gambling expenditure was just under NZ\$1 billion, relative to NZ\$557 million in 1990. Turnover was approximately NZ\$7billion. Although this indicates significant growth in expenditure since 1990, the rate of change was much slower than the doubling that was evident during the three-year period from 1987 to 1990.

1995 gambling participation and self-reported expenditure data were outlined in section 2.8, along with more recent information concerning Auckland and Christchurch.

As indicated in section 2.9, since 1991 there has also been a considerable expansion in the services available for problem and pathological gamblers. For the 1997/1998 financial year, the Committee on Problem Gambling Management (COPGM) provided \$2.2 million to fund a national telephone helpline, a wide range of counselling services, a residential treatment facility, education and publicity and research and development (Hannifin, 1999).

In 1993, during its first full year of operation, the national telephone helpline received approximately 1,000 first time calls. The number increased to just over 2,000 in 1997. In 1994, approximately 340 new clients entered community counselling. In 1997 there were 952 new clients (Committee on Problem Gambling Management, 1998). The mean age of community counselling clients in 1997 was 36 years (SD 11). Seventy-four percent were male. Sixty-nine percent were European/Pakeha, 16 percent Māori, six percent Pacific Islanders and nine percent were other ethnicities. Gaming machines outside casinos were

the main form of gambling associated with problems (57%), followed by track betting (19%), casino machines (10%), casino table games (9%), other or multiple forms (2%) and sports betting (1%). Women problem gamblers presenting for treatment were over-represented in terms of gaming machine-related problems. Men were greatly over-represented among track betters.

An examination of the national hotline data six months before and after the opening of the Auckland casino in 1996 revealed an increase of 62 percent in first time calls after the opening and a shift in the forms of gambling most strongly implicated in client problems (Sullivan, McCormick & Sellman, 1997). Prior to the casino opening, casinos were the major problem mode for seven percent of new callers. After the opening, the figure increased to 34 percent. While this suggests an increase in casino-related gambling problems, there could be other explanations such as greater publicity about problems and sources of professional help.

Hotline caller records from 1993 to 1997 indicate a steady increase in the proportion of female and Māori problem gamblers seeking help. In 1997 women made up over a third of new problem gambler callers and Māori 25 percent. Māori were greatly over-represented among women first time callers (41%). During the first few months of the hotline's operation, track betting was the major gambling form associated with problems, followed closely by gaming machines outside casinos. (Abbott, Sullivan, McAvoy & Arroll, 1994). By 1997, gaming machines ranked first (42%), followed by casinos and track betting (both 22%) (Compulsive Gambling Society, 1998).

## 3.4 Aims

As previously indicated, the general aim of the 1998 follow-up of 1991 phase two participants is to advance scientific understanding of the nature of gambling and problem gambling in the general adult population, particularly with respect to their definition and measurement and stability and change over time and the identification of factors that are associated with this stability and change.

More specific aims and objectives include:

- Contacting and re-assessing participants in Phase Two of the 1991 National Survey
- Assessing stability and change on the major measures initially employed in the 1991 Survey, including gambling participation and characteristics, positive and negative experiences associated with gambling, problem gambling, help-seeking, minor mental disorder and alcohol use/misuse.
- Identifying factors, both past and present, which are associated with and/or predict (a) present gambling participation, (b) present gambling problems and (c) present performance on other major measures
- Identifying factors, both past and present, that are associated with and/or predict (a) reductions in gambling involvement, (b) increases in gambling involvement, (c) cessation of or reduction in gambling problems and (d) the development of or an increase in gambling problems
- Identifying factors associated with major changes in gambling preference and participation and examining respondent explanations for such changes
- Assessing the particular impact of the introduction of casinos on gambling participation, problem gambling and gambling-related variables
- Examining relationships between measures of problem gambling, including the DSM-IV criteria developed subsequent to the 1991 survey, and other forms of psychological disorder to extend knowledge about the nature of problem gambling, its assessment and co-morbidity.

## 3.5 Methodology

### Introduction

Because the present study involves the longitudinal follow-up of participants in phase two of the 1991 New Zealand National Survey of Problem and Pathological Gambling, in addition to outlining the methodological details of the follow-up, it is necessary to provide an overview of the methodology employed in the 1991 investigation.

### The 1991 National Survey

#### Phase One

In phase one of the 1991 Survey, 4053 people aged 18 years or older, selected at random from telephone owning households, were interviewed by telephone and asked about their involvement in and expenditure on gambling activities. A form of random digit dialling was used to pick up households with unlisted telephone numbers. Specifically, white page residential telephone numbers were selected at random and each number chosen was incremented by one. Within households, the person aged 18 years or older with the next birthday was selected for interview. Up to eight calls were made to each household, five to establish contact and three to the eligible resident if necessary. A similar method was used to select a supplemental sample of Māori and Pacific Islanders. An ethnicity question was asked immediately after the eligible respondent was contacted and if this person was a Māori or Pacific Islander, he or she was asked for an interview. One hundred and twenty such respondents were included. Combined with Māori and Pacific Islanders from the main sample, the totals for these ethnic groupings almost reached expected proportions within the overall population. Interviewees were given the option of being interviewed in a language other than English.

Interviewees were administered a questionnaire that had been cognitively pre-tested and piloted. This questionnaire included a modified version of the South Oaks Gambling Screen (SOGS). The adapted instrument (SOGS-R) included an expanded section dealing with gambling participation and modification of the problem gambling items to include both lifetime and current (6 month) measures of problem and probable pathological gambling. As described earlier in this report, the new measure, the SOGS-R, has since superseded the SOGS in population surveys. Most of these studies, however, extended the current 'window' from six to 12 months because of indications in phase two of the 1991 New Zealand study that the six month timeframe generated relatively large numbers of false negatives - i.e. it failed to detect a significant number of people who experienced gambling problems. In addition to the SOGS-R, a series of sociodemographic questions was included.

Modifying the SOGS to provide both current and lifetime measures enabled problem gambling prevalence studies to conform to conventional practice within general epidemiology. In this field, there is greater interest in estimating the current prevalence of illnesses and disabilities within populations than in estimating the number of people who have experienced particular disorders at some time during their lives. The original SOGS reflected the viewpoint of Gamblers Anonymous and, from 1980, the American Psychiatric Association and many clinicians, that pathological gambling is invariably a chronic, or lifetime mental disorder. The SOGS-R rests on the assumption that the course of this disorder is variable and that while it may be a lifelong condition for many people, some will recover through treatment or other means and some will experience fluctuations in the severity of their gambling-related problems over time.



The phase one response rate, defined as the percentage of those contacted who agreed to participate and who subsequently completed the questionnaire, was 66 percent. A further seven percent of the total numbers called consisted of no replies or situations where the respondent was unavailable after the maximum number of callbacks had been made. The strictest definition of response rate would include this group as well, or a percentage of them based on an estimate of those who might have been eligible if contacted.

In the achieved sample, in addition to a small under-representation of Māori and Pacific Islanders, males and people aged 18 to 24 years were also slightly under-represented. The sample was subsequently weighted for age, gender and household size to bring it into conformity with population proportions. The latter weighting was conducted to correct for bias introduced by interviewing only one person per household.

## **Phase Two**

In phase two, sub-samples totalling 217 respondents were selected from the larger phase one sample and interviewed in depth, face-to-face, at a location of the respondent's choice. The great majority of interviews took place in respondent homes. Four groups were selected, namely:

- Frequent non-continuous gamblers (people who gambled weekly or more on forms of gambling such as Lotto or raffles) who did not meet SOGS-R defined criteria for problem or probable pathological gambling (n = 50)
- Frequent continuous gamblers (people who gambled weekly or more on forms of gambling such as gaming machines or track betting) who did not meet SOGS-R defined criteria for probable pathological gambling (n = 50)
- Lifetime problem gamblers (people who scored 3-4 on the lifetime version of the SOGS-R) (n = 52)
- Probable pathological gamblers (people who scored 5 or more on the lifetime version of the SOGS-R) (n = 65).

The first two groups were randomly selected from phase one respondents living in three major metropolitan areas, namely Auckland, Wellington/Hutt and Christchurch. None had a score exceeding two on the SOGS-R. Attempts were also made to recruit as many as possible of the problem gamblers resident in these regions. The large majority of the problem gambler group was recruited in this way. However, to bring the sample up to at least the required size of 50, six additional people were randomly selected from surrounding provincial areas. Efforts were made to recruit all lifetime probable pathological gamblers, irrespective of where they lived. The majority, however, came from the three major metropolitan areas. The selection of the first three groups from particular areas rather than nation-wide was a consequence of cost constraints.

Of the 320 respondents selected from phase one, 278 were successfully contacted. Of the 278, 217 (78%) were interviewed. Including those with whom contact was not made from the total 320 selected respondents, the overall response rate was 68 percent. Response rates varied somewhat across the four groups. Measured as the number of people contacted who were actually interviewed, the response rates were:

- |                                    |             |
|------------------------------------|-------------|
| • Frequent non-continuous gamblers | 81 percent  |
| • Frequent continuous gamblers     | 79 percent  |
| • Lifetime problem gamblers        | 68 percent  |
| • Probable pathological gamblers   | 84 percent. |

Measured as the number re-interviewed from the initial 320 selected, the response rates were:

- Frequent non-continuous gamblers 76 percent
- Frequent continuous gamblers 68 percent
- Lifetime problem gamblers 58 percent
- Probable pathological gamblers 71 percent.

In the case of the probable pathological gamblers, problem gamblers and frequent continuous gamblers, six percent in each category were not contacted because their phone had been disconnected or was out of order. Only two percent of the non-continuous gamblers could not be contacted for either of these reasons. Five percent of probable pathological gamblers did not answer their telephone despite repeated calls. Respective percentages for the other groups were problem gamblers (2), continuous gamblers (1) and non-continuous gamblers (1). The other major reason for failure to re-contact was that the respondent had moved residence or was temporarily living somewhere else. This applied to two probable pathological gamblers, six problem gamblers, three continuous gamblers and one non-continuous gambler. A further two respondents could not be recruited owing to language difficulties. One was a probable pathological gambler, the other a problem gambler.

Phase two interviews were conducted in September and October 1991, two to three months after the phase one interviews. Neither the interviewers nor the interviewees were told which of the four groups the latter belonged to - i.e. phase two interviews were undertaken double blind. Respondents were informed at the time of recruitment that this was a follow-up study that would involve asking them about how their gambling involvement had developed and what positive and negative effects gambling had had on their lives.

The phase two interviewers were selected from the National Research Bureau employees who had conducted the phase one interviews. Interviewers with higher than average phase one response rates and prior experience with in-depth face-to-face interviewing were chosen. All interviewers received training in the use of the interview instrument that had previously been cognitively tested and piloted with eight individuals who regularly spent NZ\$50 per week or more on gambling activities.

Consideration was given to using clinical interviewers for the phase two interviews. However, at the time, very few New Zealand mental health professionals had had experience with the assessment and treatment of problem gamblers. In addition, Dickerson (personal communication with first author, 1990), in Australia, had found that 95 percent of heavy gamblers interviewed in a similar way to phase one respondents said they would accept a residential interview if conducted by the same company. Only 45 percent said they would agree to a follow-up interview by university researchers. In this situation, the importance of obtaining a high response rate had to be considered alongside the desirability of obtaining clinical assessments by academic researchers or clinicians. On balance, the former was given higher weighting in the decision-making process.

The phase two questionnaire included the following sections:

- Structured and semi-structured questions concerning recent gambling participation, expenditure and reasons for gambling
- Structured and semi-structured questions concerning gambling participation and changes to gambling behaviour at major life stages (e.g. when respondents first started gambling, after leaving school, following marriage or first cohabiting relationship, following subsequent marriage or cohabiting relationships, after the arrival of children, after becoming unemployed and following retirement)

- Six groups of questions designed to assess perceived costs and benefits of gambling in the following domains: personal, interpersonal, employment, financial, legal and gambling participation/experience
- Questions concerning past and present help-seeking behaviour related to gambling problems
- Standardised self-completion screening instruments for non-psychotic mental disorder (12 item version of the General Health Questionnaire) and clinical depression (Beck Depression Inventory)
- A standardised self-completion measure of alcohol problems (AUDIT).

Immediately after the completion of each interview, interviewers were required to complete an assessment based on their overall impression of interviewee responses and their own observations, using a checklist of current (DSM-III-R) psychiatric criteria for pathological gambling.

Because a significant minority of phase one respondents selected for phase two were not subsequently re-interviewed for a variety of reasons, it was important to determine whether or not those re-interviewed were representative of the larger sample on major sociodemographic variables. Variables considered included gender, age and ethnicity. Performance on both current and lifetime SOGS-R was also examined.

In the case of the frequent non-continuous, frequent continuous and problem gambling groups there were no statistically significant differences between the samples interviewed in phases one and two. However, significant differences were found in the case of the phase one and phase two probable pathological groups on two variables. Whereas most Māori pathological gamblers were re-interviewed, only half of the Pacific Islanders and two-thirds of the remaining (primarily Pakeha New Zealanders of European origin) respondents were interviewed in phase two. Phase two probable pathological gamblers were also more likely than their phase one counterparts to score as currently non-problematic. This suggested that lifetime pathological gamblers who were currently experiencing problems were more difficult to contact or more likely to decline to participate in the second phase of the study.

## **The 1998 Follow-up**

### **Interviewer Selection and Training**

As in phases one and two of the original 1991 survey, follow-up interviews were conducted by NRB interviewers who were experienced in in-depth, face-to-face interviewing and who received additional training for this particular study. Interviews took place at locations chosen by interviewees, almost invariably in their own homes.

### **Questionnaire Development and Content**

Given the longitudinal nature of this study and the specific research objectives, it was important that many of the specific questions and scales used in phases one and two of the 1991 National Survey were repeated in the 1998 follow-up. However, to avoid respondent over-load and some repetition when the content of both the 1991 phase one and two questionnaires was combined, a number of items were omitted. Some new items were added. The draft instrument was cognitively tested but only minor changes were made given the desirability of keeping much of the format and content consistent with that used in 1991. The follow-up questionnaire included:

- Questions concerning lifetime, past six months and past week gambling participation and self-assessed gambling expenditure per month for each of 21 gambling activities
- The problem gambling section of the SOGS-R
- A ten-item scale based on the current DSM-IV diagnostic criteria for pathological gambling
- Two questions concerning recall of gambling advertisements
- Questions concerning preferred types of gambling and gambling activities frequently participated in with further questions assessing time involvement, expenditure per gambling session, social context and reasons for gambling
- Questions regarding preferred form of gambling and frequency of participation in 1991, self-assessment of changes in gambling participation since 1991 and reasons for changes
- Six groupings of questions designed to assess perceived costs and benefits of gambling in the following areas: personal, interpersonal, employment, financial, legal and gambling participation/experience
- Questions concerning past and present gambling problems of respondents and people known to respondents and help-seeking behaviour related to gambling
- A question concerning general life satisfaction
- Sociodemographic questions
- Short version of the General Health Questionnaire (GHQ-12) - a self-completion screening instrument for non-psychotic mental disorder
- AUDIT - a standardised self-completion measure of alcohol problems.

The first set of questions included those used in the 1991 phase one questionnaire as well as new items to cover forms of gambling introduced since the baseline study. The second set of questions - the scored section of the SOGS-R - were the same as those used in the 1991 phase one questionnaire. As in the 1991 survey, a six-month presentation was used to facilitate comparison over time, even though it is now customary to administer the SOGS-R with a 12-month time frame.

The third set of questions was an addition not included in the 1991 survey. These questions were developed by Fisher (1996) to assess pathological gambling according to DSM-IV diagnostic criteria and all of the items are framed in the past year. The wording of some items was modified slightly following cognitive testing in the New Zealand context. This measure, referred to as the Fisher DSM-IV Screen, has been used in recent North American surveys and the Swedish National Pathological Gambling Survey (Rönnerberg, Volberg & Abbott et al, 1999; Volberg, 1996; 1997a; 1997b; Volberg & Moore, 1999a; 1999b). In analysing the screen's technical performance among British casino patrons, Fisher (1996) found that it had good internal consistency as well as factorial, construct and face validity. In the North American surveys, the Fisher DSM-IV Screen maintained its factorial validity and had high levels of correlation with other measures of problem and pathological gambling. Its reliability was variable and somewhat lower than in the British study.

In the 1991 National Survey, the survey interviewers made diagnostic ratings using criteria from the earlier DSM-III-R. The Fisher DSM-IV Screen was substituted in the present study to facilitate comparison with recent North American and Swedish studies, anticipated future studies and other parts of the NZGS that use this measure. The scoring system used in the North American and Swedish prevalence studies mentioned above was adopted.

The next two sections, namely those concerning recall of gambling advertising and gambling participation, had been included in phase two of the 1991 survey.

The following set of questions primarily consisted of new items added to assist in examining changes in gambling behaviour since 1991.

The groupings of questions concerning perceived costs and benefits associated with gambling had been included in phase two of the 1991 survey.

The next section included some questions that had been included in phase two of the 1991 survey as well as additional questions to gather further information about help seeking related to changes in gambling behaviour and gambling problems.

The life satisfaction measure had not been included in the 1991 baseline study. It was added to allow relationships between gambling, problem gambling and wellbeing to be considered.

The sociodemographic questions were generally similar to those used in phase one of the 1991 study with the exception of additional questions to assess labour force participation more accurately.

The GHQ-12 and AUDIT had been used in phase two of the 1991 survey. The Beck Depression Inventory, which was also included in 1991, was not repeated as performance on this instrument was strongly correlated with GHQ-12 performance and was thus considered redundant.

The full version of the 1998 Follow-up questionnaire that was administered to participants is provided in Appendix One.

## **Ethical Approval**

Prior to the commencement of interviewing, the research proposal, including a draft of the survey instrument, was submitted to and approved by the Auckland Institute of Technology Research Ethics Committee.

## **Participant Recruitment**

Following their phase two interviews in 1991, participants were asked if they could be re-contacted at some future time to be interviewed on the same topic with a view to examining any changes. The 212 people who agreed to be re-contacted were asked to give the name,

address and telephone number of one or more people who knew them to assist in maintaining contact with the National Research Bureau (NRB) should they move residence in the future. They were also invited to forward change of address information to NRB.

Attempts to re-contact all 1991 phase two participants who agreed to be re-contacted were made on six occasions between 1992 and 1998, the last occasion during February 1998. Of the original 217 people interviewed in 1991, 143 were contacted in 1998 and said they were willing to be interviewed. Follow-up contact waves were as follows:

| Wave Number    | Date       | Number Contacted and Available |
|----------------|------------|--------------------------------|
| Phase 2 Survey | Sept. 1991 | 217                            |
| Wave 1         | Dec.1991   | 212                            |
| Wave 2         | June 1992  | 212                            |
| Wave 3         | Feb. 1993  | 205                            |
| Wave 4         | Dec. 1993  | 191                            |
| Wave 5         | Aug. 1994  | 172                            |
| Wave 6         | Feb. 1998  | 143                            |

Contact procedures used during waves one to five included:

- Telephoning up to five times on different occasions and at different times of the day
- Telephoning (if required) people originally nominated by respondents for contact information
- Visiting the last address to attempt to make contact with the respondent or ask the new occupant for a forwarding address
- Visiting neighbours on either side of the dwelling to check if the dwelling was occupied in the event that there had been no reply, to obtain a forwarding address if the respondent had moved and one was left, or to ask if a reason for the respondent's absence was known.

During wave six, in addition to the above procedures, additional attempts were made to contact respondents not located by checking all white page telephone directories and electoral roles.

All 143 respondents who indicated that they were willing to participate were re-interviewed during October and November 1998.

## **Procedure**

Shortly before 1998 interviews commenced, the 143 respondents who agreed to be re-interviewed were telephoned by an NRB interviewer, reminded of their previous involvement and invited to confirm their participation. A convenient time and place to conduct an interview was arranged with each of the 143 participants.

Immediately prior to commencement of the face-to-face interviews, written, informed consent was sought and obtained from each potential participant. This included permission to link the information about to be gathered with that obtained in 1991.

Interview schedule and self-completion questionnaire responses were coded and standardised measures scored by NRB staff according to directions provided by the principal investigators and under the supervision of an NRB senior research officer. Following edit checks and data cleaning, data were entered and linked to 1991 phase one and two information for each participant. Each data file was given a code identifier. Names, with participant identifiers, were secured separately.

## Response Rates

As indicated, 143 of the 217 1991 phase two respondents were re-interviewed, an overall response rate of 66 percent. Response rates for the four 1991 SOGS-R defined categories were:

- |                                    |            |
|------------------------------------|------------|
| • Frequent non-continuous gamblers | 64 percent |
| • Frequent continuous gamblers     | 68 percent |
| • Problem gamblers                 | 73 percent |
| • Probable pathological gamblers   | 60 percent |

## Sampling and Data Analysis

The sampling for phase one of the 1991 national survey involved use of a complex sampling scheme, with unequal weighting of survey responses to reflect unequal selection probabilities for individuals. Details of the design of phase one of the 1991 survey were described earlier. Phase two participants for 1991 were chosen as a subset of phase one participants, so that the four subgroups of frequent and problem gamblers also contained individuals selected with unequal probabilities. In addition, each of the four subgroups was selected with a different probability from phase two participants. This means that the sampling scheme for phase two participants, even within subgroups, contains individuals that have unequal selection probabilities and therefore unequal sampling weights.

In analysing phase two of the 1991 study and the 1998 follow-up data, two choices are available. Either the data can be analysed as a complex design, or it can be analysed conditional on the sample actually drawn at phase two for 1991. Recognising the complex design complicates the analysis, especially as phase two participants in some categories in 1991 (and consequently in 1998) were limited to those phase one participants who in 1991 lived in Auckland, Wellington or Christchurch. This restricted geographical aspect of the phase two 1991 and the 1998 follow-up design can not be incorporated into a complex design in such a way as to enable inference to the whole of New Zealand. The decision thus made was to analyse the 1991 phase one and 1998 follow-up data conditional on the sample actually drawn. Essentially this means statistical inference is to a population that reflects the same mix as the sample, either within subgroups or as a whole, rather than to the New Zealand population as whole. If the design can be ignored for inference purposes, and this is an assumption that cannot be completely checked in the present study, inference to the New Zealand population is also possible.

The connected, substantive gambling related issue relates to what the follow-up study as a whole is, and is not. Regardless of survey design issues the study follows, as intended, the subgroups of 1991 phase two participants, rather than all subgroups found in phase one of the 1991 survey.

**The follow-up consequently has lost some of the 1991 participants, but no people who have become frequent or problem gamblers since 1991 have been recruited. Thus, estimates of change between 1991 and 1998 in the incidence or extent of frequent and problem gambling for New Zealand as a whole can not be derived from the follow-up study. The follow-up was instead intended to concentrate on whether people who were frequent and problem gamblers in 1991 remain so in 1998. More specifically it focuses only on those people who were in the 1991 phase two study, so that strictly speaking, inferences in a statistical sense as to how 1991 frequent and problem gamblers for New Zealand as whole are behaving in 1998 also require caution in interpretation.**

## Representativeness

Participant attrition is a feature of all longitudinal studies. It has the potential to complicate data analysis and the interpretation of findings. Attrition can be particularly problematic if those who drop out differ from those who remain on variables of major interest. In the present situation, participants who were re-interviewed in 1998 ( $n = 143$ ) were compared with those who were not ( $n = 74$ ) on a wide range of measures as assessed in 1991. The measures examined in this regard are indicated in Table 2. The measures are classified as either categorical or continuous. Categorical or nominal measures involve placing respondents into categories, e.g. male or female. Continuous measures involve the use of some form of scale, e.g. a score on the SOGS-R.

Table 3 outlines comparisons between re-interviewed and non-re-interviewed participants on the majority of 1991 measures. As the concern is to examine how representative the 1998 participants are of those included in the 1991 phase two study, the measures considered are confined to those assessed in 1991. In most instances, the percentages of respondents in relevant categories are shown. In the case of the psychometric scales (the SOGS-R, AUDIT and GHQ-12) mean scores are also provided. Self-rated health, a question from the GHQ-12 which is not included in the composite mental health measure derived from this instrument, is also treated as a continuous variable and represented by mean scores and standard deviations. The data were not weighted prior to presentation or analysis.

**Table 2. Variables Assessed in Comparison of Follow-up and Non Follow-up Subjects**

| Variable Type                              |                                    |
|--|------------------------------------|
| Categorical                                | Continuous                         |
| Gender                                     | Lifetime SOGS-R score              |
| Age  | Current SOGS-R score               |
| Ethnicity                                  | Interviewer rating (DSM3-R--based) |
| Marital status                             | Amount spent per month             |
| Income (total household)                   | Lotto                              |
| Lifetime SOGS classification               | Instant kiwi                       |
| Current SOGS classification                | Other lotteries or raffles         |
| Interviewer Classification (DSM3-R--based) | Housie                             |
| Ever had a problem with gambling?          | Horses/dogs                        |
| Preferred gambling                         | Gaming machines                    |
| Frequently gamble                          | Spend per session                  |
| Lotto                                      | Lotto                              |
| Instant kiwi                               | Instant kiwi                       |
| Other lotteries or raffles                 | Other lotteries or raffles         |
| Housie                                     | Housie                             |
| Horses/dogs                                | Horses/dogs                        |
| Gaming machines                            | Gaming machines                    |
| AUDITcaseness (= 8)                        | Usual session length               |
| AUDIT caseness (= 10)                      | Lotto                              |
| GHQ caseness                               | Instant kiwi                       |
|  | Other Lotteries or Raffles         |
|  | Housie                             |
|  | Horses/dogs                        |
|  | Gaming machines                    |
|  | GHQ (/12)                          |
|  | Self-rated health                  |
|  | AUDIT score                        |

Categorical variables (those shown as percentages in Table 3) were assessed for statistical significance by chi-square. Continuous variables (those summarised by means, standard deviations and medians) were assessed by both t-tests and their non-parametric counterparts (Mann-Whitney U). Factorial ANOVAS, employing GROUP (follow-up versus non-follow-up) and Lifetime SOGS-R (TYPE) as independent variables were also undertaken. The results of these analyses are summarised in Table 3.



As mentioned earlier, given the complex, multistage method by which participants were selected for this study, caution is required when standard statistical procedures are used. This applies particularly with regard to variance estimates such as standard deviations and the significance values from statistical tests. The p values outlined in Table 3 should be considered approximations only. In addition, when multiple tests are conducted, some are expected to be significant on a chance basis alone. For these reasons, probably only p values below 0.01 should be considered likely to indicate a significant difference between the two groups.

Inspection of Table 3 suggests that, with respect to the great majority of measures, as assessed in 1991, the re-interviewed participants are similar to their non-re-interviewed counterparts.

It was expected that there would be higher attrition within the older age groups, particularly people who were 65 years or older when they were interviewed in 1991. The majority of respondents known to have died since 1991 were in this category. While attrition was somewhat higher in the two oldest categories, the difference fell short of conventional statistical significance levels.

The groups were comparable with respect to gender, marital status and household income.

Probably the most notable difference was the much smaller percentage of Māori respondents who were re-interviewed. Twenty-four percent of the non-contacted respondents were Māori compared to only eight percent of those who were interviewed in 1998. Percentages were also lower for Pacific Island and other non-European/Pakeha respondents who were re-interviewed.

Generally, the differences between the original and re-interviewed groups were minor on the categorical and continuous lifetime and current SOGS-R derived measures. Although fewer 1991 interviewer assessed (DSM-III-R) pathological gamblers were re-interviewed in 1998 (they made up 15 percent of the 1991 sample and 7 percent of 1998 participants), this difference was not statistically significant. The only index of problem gambling that appeared to differ significantly concerned 1991 participant self-ratings of whether or not they considered that they had ever had a gambling problem. Twenty-seven percent of those who were not re-interviewed in 1998 considered that they had had a gambling problem at some time compared to 13 percent of those who were re-interviewed.

The original and re-interviewed groups did not differ significantly with respect to their 1991 preferred forms of gambling, gambling frequency or reported gambling expenditure. Neither did they vary with respect to alcohol problems or presence of GHQ-12-defined non-psychotic mental disorder.

The re-interviewed participants had rated themselves as having better general health in 1991 than those who were not re-interviewed in 1998.

**Table 3. 1991 Baseline Characteristics of Follow-up and Non Follow-up Subjects**

| Characteristic as measured in 1991    | Non Follow-up Group<br>(N=74) <sup>1</sup> | Follow-up Group<br>(N=143) <sup>1</sup> | P Value <sup>5</sup> |
|---------------------------------------|--|---|----------------------|
| Male (%)                              | 60   | 54                                      | .430                 |
| Age                                   |  |   | .074                 |
| 18-24 (%)                             | 16   | 14                                      |                      |
| 25-29 (%)                             | 16   | 15                                      |                      |
| 30-39 (%)                             | 24   | 30                                      |                      |
| 40-49 (%)                             | 8  | 20                                      |                      |
| 50-64 (%)                             | 22   | 15                                      |                      |
| 65+ (%)                               | 14   | 6                                       |                      |
| Ethnicity                             |  |   | .002                 |
| European (%)                          | 60   | 83                                      |                      |
| Māori (%)                             | 24   | 8                                       |                      |
| Pacific Is. (%)                       | 7  | 3                                       |                      |
| Other (%)                             | 10   | 6                                       |                      |
| Marital status                        |  |   | .086                 |
| Married (%)                           | 45   | 55                                      |                      |
| Living with partner (%)               | 5  | 8                                       |                      |
| Separated/divorced (%)                | 11   | 13                                      |                      |
| Widowed (%)                           | 11   | 3                                       |                      |
| Never married (%)                     | 28   | 22                                      |                      |
| Household income <sup>1</sup>         |  |   | .432                 |
| <\$15,000 (%)                         | 9  | 8                                       |                      |
| \$15,000 - \$25,000 (%)               | 30   | 19                                      |                      |
| \$25,000 - \$35,000 (%)               | 19   | 25                                      |                      |
| \$35,000 - \$50,000 (%)               | 20   | 20                                      |                      |
| >\$50,000 (%)                         | 22   | 28                                      |                      |
| Lifetime SOGS-R Type                  |  |   | .498                 |
| Probable Pathological (%)             | 35   | 27                                      |                      |
| Problem (%)                           | 19   | 27                                      |                      |
| Continuous (%)                        | 22   | 24                                      |                      |
| Non Continuous (%)                    | 24   | 22                                      |                      |
| Lifetime SOGS-R Score <sup>2</sup>    | 3.1 (±2.9)                                 | 2.9 (±3.0)                              | .442                 |
| Current SOGS-R Type                   |  |   | .532                 |
| Probable Pathological (%)             | 16   | 9                                       |                      |
| Problem (%)                           | 12   | 15                                      |                      |
| Continuous (%)                        | 28   | 34                                      |                      |
| Non Continuous (%)                    | 30   | 31                                      |                      |
| Irregular/Non Gambler (%)             | 14   | 11                                      |                      |
| Current SOGS-R Score <sup>2</sup>     | 1.6 (±2.2)                                 | 1.5 (±1.9)                              | 1.000                |
| Pathological Gambler (DSM) (%)        | 15   | 7                                       | .063                 |
| Have had a gambling problem (%)       | 27   | 13                                      | .008                 |
| Preferred gambling                    |  |   | .227                 |
| Lotto (%)                             | 36   | 48                                      |                      |
| Instant Kiwi (%)                      | 8  | 9                                       |                      |
| Other Lotteries, raffles (%)          | 4  | 2                                       |                      |
| Horses/Dogs (%)                       | 31   | 17                                      |                      |
| Gaming machines (non casino) (%)      | 5  | 8                                       |                      |
| Other/none (%)                        | 15   | 15                                      |                      |
| Frequently gamble                     |  |   |                      |
| Lotto (%)                             | 88   | 87                                      | .815                 |
| Instant Kiwi (%)                      | 57   | 59                                      | .779                 |
| Other Lotteries, raffles (%)          | 41   | 43                                      | .765                 |
| Housie (%)                            | 5  | 8                                       | .425                 |
| Horses/Dogs (%)                       | 35   | 31                                      | .514                 |
| Gaming machines (non casino) (%)      | 23   | 25                                      | .806                 |
| Dollars spent per month               |  |   |                      |
| Lotto <sup>3</sup>                    | 20.0 (69)                                  | 20.0 (133)                              | .321                 |
| Instant Kiwi <sup>2</sup>             | 7.0 (52)                                   | 5.0 (105)                               | .161                 |
| Other lotteries, raffles <sup>3</sup> | 5.0 (40)                                   | 5.0 (104)                               | .924                 |

|   |                  |                  |      |
|---|------------------|------------------|------|
| Housie                                    | 12.5 (6)         | 20.0 (9)         | .474 |
| Horses/Dogs <sup>3</sup>                  | 37.5 (24)        | 20.0 (41)        | .066 |
| Gaming machines (non casino) <sup>3</sup> | 10.0 (17)        | 10.0 (41)        | .597 |
| All gambling activities                   | 36.0             | 40.0             | .907 |
| Usual session length (mins)               |                  |                  |      |
| Lotto <sup>4</sup>                        | 5.0 (65)         | 5.0 (124)        | .296 |
| Instant Kiwi <sup>4</sup>                 | 3.0 (42)         | 3.0 (84)         | .845 |
| Other Lotteries, raffles <sup>4</sup>     | 2.0 (30)         | 3.0 (61)         | .039 |
| Housie <sup>4</sup>                       | 170.0 (4)        | 150.0 (12)       | .599 |
| Horses/Dogs <sup>4</sup>                  | 120.0 (26)       | 135.0 (44)       | .826 |
| Gaming machines (non casino) <sup>4</sup> | 30.0 (17)        | 30.0 (35)        | .723 |
| AUDIT case $\geq$ 10 (%)                  | 29               | 30               | .886 |
| AUDIT score <sup>2</sup>                  | 7.8 ( $\pm$ 2.6) | 1.6 ( $\pm$ 2.9) | .723 |
| GHQ Case (%)                              | 31               | 22               | .129 |
| GHQ Score <sup>2</sup>                    | 1.9 ( $\pm$ 2.6) | 1.6 ( $\pm$ 2.9) | .228 |
| Self-rated Health <sup>2</sup>            | 1.4 ( $\pm$ .6)  | 1.2 ( $\pm$ .4)  | .001 |

<sup>1</sup>Numbers in the groups for Household Income and AUDIT caseness were slightly lower due to missing values.

<sup>2</sup>Values are mean (SD)

<sup>3</sup>Values are medians (N). Sample sizes for these variables were smaller as the data relate only to respondents who had spent money on the activity in the past 6 months.

<sup>4</sup>Values are medians (N). Sample sizes for these variables are smaller as the data relate only to respondents who frequently took part in the activities.

<sup>5</sup>Chi-square tests were undertaken for categorical variables and Mann-Whitney U tests for continuous variables.

In summary, as indicated above, on most measures the two groups were similar. This included gambling participation and SOGS-R assessed problem and probable pathological gambling. However, fewer Māori, Pacific Island and other ethnic minority group members were re-interviewed. 1991 participants who rated their general health as being fair or poor in 1991 were also less likely to be interviewed. There are also some indications that people with more severe gambling problems may have been under-represented at follow-up although, as mentioned, this was not evident from the SOGS-R measures.

## 3.6 Findings

### Introduction

This section of the report outlines the major findings from the 1998 follow-up survey. First, stability and change on the major measures initially employed in the 1991 survey are considered. These measures include awareness of gambling advertising, problem gambling, gambling participation, perceived costs and benefits of gambling, help seeking, minor mental disorder and alcohol use/misuse. Relationships between a number of the measures, as assessed in both 1991 and 1998, are also examined. Factors in 1991 that are associated with gambling participation, gambling problems and other outcomes in 1998 are identified. These factors are further considered to develop predictive models of a number of important 1998 outcomes. Finally, analyses are reported that attempt to assess the impact of the introduction of casinos on survey participants.

### Stability and Change

#### Advertising Awareness

In 1991, as an introduction to the interview, participants were asked whether they recalled having heard, seen or read any advertisements for any type of gambling. Those who said they noticed such advertisements were then asked what type of activities they had seen advertised. These questions were repeated in 1998.

Only 3.5 percent of the 1998 respondents indicated that they could not recall any form of gambling advertising. The same percentage of these respondents indicated likewise when they were interviewed seven years previously. Lotto advertising was mentioned most frequently in both 1991 (89.5%) and 1998 (81%). In 1991, Instant Kiwi (65%) and horse/dog racing (40%) were mentioned next most frequently. 1998 figures were 28 and 25 percent respectively, suggesting an appreciable drop in awareness of these forms of advertising. However, the TAB was mentioned more frequently (24.5% in 1991; 44% in 1998). The reduction for Instant Kiwi may have been due to lower levels of advertising rather than reduced awareness. Approximately similar numbers mentioned lotteries and raffles in 1991 and 1998 (20% and 16% respectively).

Other forms of gambling advertising mentioned frequently in 1998 included TeleBingo (59%), Daily Keno (41%), casinos (21%) and sports betting (16%). These forms of gambling were not available in 1991.

Probable pathological gamblers were the only group in both years where all respondents noticed at least some form of advertising. This group appeared to be somewhat more likely than problem gamblers, frequent continuous gamblers and frequent non-continuous gamblers to notice Instant Kiwi and sports betting. Problem gamblers were more likely than those in the other groups to mention horse/dog racing, television games/radio competitions and Daily Keno. The non-continuous respondents mentioned TeleBingo more often than the other groups did, but mentioned horse/dog racing, sports betting and lotteries/raffles least often. These apparent differences were not tested for statistical significance and may be unreliable given the relatively small sample sizes.

## **Gambling, Health and Mental Health Measures**

### **Whole Sample**

Table 4 lists the measures that were formally compared to assess change from 1991 to 1998 in the re-interviewed sample. Changes on these measures were assessed for statistical significance. These changes and associated tests for significance are shown in Tables 5 and 7 to 10. In the case of categorical variables, McNemar and Bowker's tests were used. The latter test was used for polychotomous variables and when sample sizes were too small categories were collapsed prior to analysis. 'Polychotomous' refers to categorical measures when more than two categories are used.

Some of the continuous variables were not distributed normally. While paired t-tests and factorial repeated measures ANOVAs were used, nonparametric tests (Wilcoxon signed ranks) were also used to take account of non-normally distributed data. Analyses were undertaken for the sample as a whole ( $n = 143$ ) and each of the gambling/problem gambling subgroups. As mentioned earlier, the findings of these analyses should be treated with caution and considered to be exploratory rather than definitive.

Table 5 provides information on the whole follow-up sample ( $n = 143$ ) in 1991 and 1998 with respect to SOGS-R performance, gambling preferences, participation, expenditure and usual session length, and AUDIT, GHQ-12 and self-rated health measures. SOGS-R, AUDIT, and GHQ-12 measures are presented both using conventional categorisations and raw scores. The results of tests of statistical significance for whole sample changes over time are also summarised here.

From inspection of Table 5 it is evident that significant changes occurred between 1991 and 1998 with respect to the overall percentages of respondents classified within the five major categories used, namely probable pathological, problem, continuous, non-continuous and irregular/non-gambler.

**Table 4. Variables Assessed for Changes from 1991 Baseline to 1998 Follow-up**

| Variable Type                  |                                     |
|--------------------------------|-------------------------------------|
| Categorical                    | Continuous                          |
| Marital status                 | Lifetime SOGS-R score               |
| Lifetime SOGS-R classification | Current SOGS-R score                |
| Current SOGS-R classification  | Amount spent per month <sup>1</sup> |
| AUDIT caseness (= 8)           | Lotto                               |
| AUDIT caseness (= 10)          | Instant kiwi                        |
| GHQ caseness                   | Housie                              |
| Preferred type of gambling     | Horses/dogs                         |
| Lotto                          | Gaming machines (non casino)        |
| Instant Kiwi                   | Casinos                             |
| Other lotteries, raffles       | Daily Keno                          |
| Housie                         | TeleBingo                           |
| Horses/dogs                    | All gambling activities             |
| Gaming machines (non casino)   | Usual session length <sup>1</sup>   |
| Casinos                        | Lotto                               |
| Frequently bet                 | Instant kiwi                        |
| Lotto                          | Housie                              |
| Instant Kiwi                   | Horses/dogs                         |
| Other lotteries, or raffles    | Gaming machines (non casino)        |
| Housie                         | Casinos                             |
| Horses/dogs                    | Daily Keno                          |
| Gaming machines (non casino)   | TeleBingo                           |
| Casinos                        | GHQ-12                              |
| Daily Keno                     | Self-rated health                   |
| TeleBingo                      | AUDIT score                         |

<sup>1</sup>These measures relate to activities indicated by respondents as undertaken during the past 6 months (Amount per month) or frequently (Usual session length). Persons not undertaking the activities during this period or frequently have no scores. The pre-post comparisons therefore need to be interpreted appropriately.

**Table 5. 1991 Baseline and 1998 Follow-up Characteristics - All Subjects (N=143) <sup>1</sup>**

| Characteristic                     | 1991 Baseline | 1998 Follow-up | P Value <sup>6</sup> |
|------------------------------------|---------------|----------------|----------------------|
| Lifetime SOGS-R Type               |               |                | <.001 <sup>7</sup>   |
| Probable Pathological (%)          | 27            | 13             |                      |
| Problem (%)                        | 27            | 17             |                      |
| Continuous (%)                     | 24            | 13             |                      |
| Non continuous (%)                 | 22            | 37             |                      |
| Irregular/ Non Gambler             | 0             | 21             |                      |
| Probable Pathological /Problem (%) | 54            | 29             | <.001                |
| Lifetime SOGS-R Score <sup>2</sup> | 2.9 (±3.0)    | 2.0 (±2.8)     | <.001                |
| Current SOGS-R Type                |               |                | <.001                |
| Probable Pathological (%)          | 9             | 6              |                      |
| Problem (%)                        | 15            | 7              |                      |
| Continuous (%)                     | 34            | 20             |                      |
| Non Continuous (%)                 | 31            | 42             |                      |
| Irregular/Non Gambler (%)          | 11            | 24             |                      |
| Probable Pathological /Problem (%) | 24            | 13             | .003                 |
| Current SOGS-R Score <sup>2</sup>  | 1.5 (±1.9)    | 1.0 (±1.9)     | .003                 |
| Preferred gambling                 |               |                |                      |
| Lotto (%)                          | 48            | 59             | .058                 |
| Instant Kiwi (%)                   | 9             | 2              | .021                 |
| Other lotteries, or raffles        | 2             | 2              | 1.000                |
| Horses/Dogs (%)                    | 17            | 15             | .629                 |

|  |                  |                  |                   |
|--|------------------|------------------|-------------------|
| Gaming machines (non casino) (%)                   | 8                | 3                | .057              |
| Casinos  | 1                | 6                | .008              |
| Frequently bet                                     |                  |                  |                   |
| Lotto (%)  | 87               | 88               | .851              |
| Instant Kiwi (%)                                   | 59               | 30               | <.001             |
| Other Lotteries, raffles (%)                       | 43               | 24               | <.001             |
| Horses/Dogs (%)                                    | 31               | 22               | .017              |
| Gaming machines (non casino) (%)                   | 24               | 7                | <.001             |
| Casinos (%)  | 1                | 10               | .002              |
| Daily Keno (%)                                     | -                | 6                | -                 |
| TeleBingo (%)                                      | -                | 17               | -                 |
| Dollars spent per month <sup>3</sup>               |                  |                  |                   |
| Lotto (N = 123) <sup>4</sup>                       | 20               | 20               | .160              |
| Instant Kiwi (N = 72) <sup>4</sup>                 | 5                | 5                | .036 <sup>8</sup> |
| Other lotteries, raffles (N = 78) <sup>4</sup>     | 5                | 5                | .478              |
| Horses/Dogs (N = 25) <sup>4</sup>                  | 40               | 40               | .424              |
| Gaming machines (non casino) (N = 21) <sup>4</sup> | 10               | 10               | .407              |
| Casinos (N = 30) <sup>4</sup>                      | -                | 12.5             | -                 |
| Daily Keno (N = 15)                                | -                | 10.0             | -                 |
| TeleBingo (N = 44)                                 | -                | 5.5              | -                 |
| All gambling activities                            | 40               | 44               | .023              |
| Usual session length (mins) <sup>3</sup>           |                  |                  |                   |
| Lotto (N = 111) <sup>5</sup>                       | 5                | 5                | .764              |
| Instant Kiwi (N = 35) <sup>5</sup>                 | 3                | 5                | .058              |
| Other lotteries, raffles (N = 22) <sup>5</sup>     | 4                | 2                | .108              |
| Horses/Dogs (N = 27) <sup>5</sup>                  | 90               | 120              | .361              |
| Gaming machines (non casino) (N = 7) <sup>5</sup>  | 33               | 50               | .917              |
| Casinos (N = 14) <sup>5</sup>                      | -                | 120              | -                 |
| Daily Keno (N=9) <sup>5</sup>                      | -                | 5                | -                 |
| TeleBingo (N=24) <sup>5</sup>                      | -                | 30               | -                 |
| AUDIT Case $\geq$ 10 (%)                           | 30               | 21               | .015              |
| AUDIT Score <sup>2</sup>                           | 7.1 ( $\pm$ 5.9) | 6.4 ( $\pm$ 6.2) | .023              |
| GHQ Case (%)                                       | 22               | 14               | .09               |
| GHQ Score <sup>2</sup>                             | 1.6 ( $\pm$ 2.9) | 1.0 ( $\pm$ 2.1) | .023              |
| Self-rated Health <sup>2</sup>                     | 1.2 ( $\pm$ .4)  | 1.2 ( $\pm$ .5)  | .023              |

<sup>1</sup>Numbers in the groups for the AUDIT variables were slightly lower due to missing values.

<sup>2</sup>Values are means (SD).

<sup>3</sup>Values are medians.

<sup>4</sup>Sample sizes are smaller as the data relate only to respondents who had spent money on the activity during the past 6 months at both assessments, or, in the case of Casinos, Daily Keno and TeleBingo, during the 6 months prior to follow-up.

<sup>5</sup>Sample sizes are smaller as the data related only to respondents who frequently gambled on the activity at both assessments, or, in the case of Casinos, Daily Keno and TeleBingo, frequently gambled on the activity at follow-up.

<sup>6</sup>McNemar and Bowker's chi-square tests were undertaken for changes in categorical variables and Wilcoxon signed ranks tests for continuous variables.

<sup>7</sup>Non continuous and Irregular/Non gambler activities collapsed for statistical test.

<sup>8</sup>Follow-up values are significantly lower despite equivalent medians.

From Table 5, it can be seen that 54 percent of the total sample (n=143) were classified as lifetime probable pathological gamblers or problem gamblers in 1991. In 1998, only 29 percent were thus classified. In 1991, apart from some lifetime probable pathological or problem gamblers who were not experiencing problems of this severity at the time they were interviewed, no other respondent included in the study was an irregular or non-gambler. In 1998, 21 percent of re-interviewed participants reported that in the past six months they either did not gamble or gambled infrequently.

In 1991, 39 of the 143 participants included in the present study were classified on the basis of their SOGS-R scores as having experienced serious gambling related problems at some stage in their lives (i.e. lifetime probable pathological gamblers). Thirteen of these 39 were classified by the SOGS-R as having experienced problems of similar severity during the six months prior to their 1991 assessment (i.e. current probable pathological gamblers). In 1991, 38 participants were defined as having significant but less severe gambling related problems

at some time (i.e. lifetime problem gamblers) and 22 identified as experiencing problems of this magnitude during the previous six months (current problem gamblers).

When the 143 participants were re-assessed in 1998 using the SOGS-R, 18 were classified as lifetime probable pathological gamblers and nine were classified as current probable pathological gamblers. Twenty-four were classified as lifetime problem gamblers and ten were classified as current problem gamblers.

**These findings suggest that there was a considerable reduction in the prevalence of gambling problems over time within the total sample. These changes were assessed for statistical significance (refer to Table 5). The reductions in lifetime and current probable pathological and problem gambling ‘cases’ and changes in mean scores are highly significant.**

A number of changes in gambling behaviour were also evident across the sample as a whole (refer to Table 5). Instant Kiwi appears to have declined in popularity on most measures (i.e. preferred form, frequently bet and monthly expenditure). Frequency of gaming machine participation outside of casinos also reduced significantly. Casinos, on the other hand, have increased in popularity, although they were still only nominated as the preferred form of gambling by six percent of the total sample and participated in regularly by ten percent.

The 1991 baseline survey was undertaken prior to the opening of casinos in Christchurch (1994) and Auckland (1996). Other than Lotto, which retained its 1991 popularity ranking and participation rate, frequency of participation declined appreciably in all other major categories of gambling available since 1991. However, apart from Instant Kiwi, expenditure on these categories appear to have remained much the same. Some new forms of gambling, including Daily Keno and TeleBingo, were moderately popular in 1998. Median overall individual monthly gambling expenditure increased by \$4.00. This increase is statistically significant. However, if adjusted for purchasing power in 1991, overall 1998 gambling expenditure would have been somewhat lower than in 1991.

It should be noted that the expenditure data for individual activities only applies to people who actually gambled on each activity in both 1991 and 1998.

Considered collectively, these findings indicate a reduction in gambling-related problems within this particular sample of New Zealanders that in 1991 contained approximately even numbers of people who had experienced gambling problems at some stage in their lives or who gambled weekly or more but did not have significant gambling-related problems. **Other than purchasing Lotto tickets, frequent participation in other forms of gambling available in 1991 reduced appreciably, although overall gambling expenditure (for those who gambled within the six months prior to being reinterviewed) remained much the same. In part this was because reductions in established forms of gambling were offset by expenditure on new forms.** The sample also evidenced somewhat lower levels of alcohol-related problems, psychological disturbance and self-rated health although the statistical significance of these reductions is generally marginal.

## **Clinical Classification**

This section provides more detailed information regarding changes in clinical classification from 1991 to 1998.

## **Problem Gambling**

It was expected that most of the 39 lifetime probable pathological gamblers assessed in 1991 would be similarly classified when reassessed with the same measure in 1998. From Table 6 it is evident that only 28 percent of respondents who were classified as lifetime probable pathological gamblers in 1991 were similarly classified seven years later. However, two-

thirds obtained scores that placed them within the lifetime disordered gambling categories (i.e. problem or probable pathological gamblers).

With respect to the 38 1991 lifetime problem gamblers, it was hypothesised that a substantial minority would develop more serious gambling-related problems and would be classified as lifetime probable pathological gamblers when re-assessed in 1998. It was expected that the large majority of the remainder would retain their 1991 classification as lifetime problem gamblers. From Table 6 it can be seen that contrary to expectation, only 13 percent of 1991 lifetime problem gamblers received the same classification in 1998. A larger number (18%) scored within the probable pathological gambling range. Over two-thirds scored as non-problematic in 1998.

Change of the magnitude found for respondents initially classified as lifetime problem or probable pathological gamblers was not expected. However, these changes are consistent with performance on a number of other lifetime gambling and problem gambling questions included in this study. These findings raise important questions about the stability or test-retest reliability of the lifetime SOGS-R measure when large intervals of time elapse between assessments. These questions will be addressed briefly below and more fully in Chapter 4.

**Table 6. Status at 1998 Follow-up by 1991 Baseline Status**

| 1991 Baseline   |                       |                | 1998 Follow-up        |                       |    |          |                     |
|-----------------|-----------------------|----------------|-----------------------|-----------------------|----|----------|---------------------|
| Classification  | Status                | N              | Classification        | Status                | N  | Perc ent | 95% CI <sup>1</sup> |
| Lifetime SOGS-R | Probable Pathological | 39             | Lifetime SOGS-R       | Probable Pathological | 11 | 28       | 11, 49              |
|                 |                       |                |                       | Problem               | 15 | 38       | 19, 59              |
|                 |                       |                |                       | Continuous            | 4  | 10       | 1, 28               |
|                 |                       |                |                       | Non continuous        | 5  | 13       | 2, 31               |
|                 | Problem               | 38             |                       | Irregular/Non gambler | 4  | 10       | 1, 28               |
|                 |                       |                |                       | Probable Pathological | 7  | 18       | 5, 38               |
|                 |                       |                |                       | Problem               | 5  | 13       | 2, 32               |
|                 |                       |                |                       | Continuous            | 4  | 11       | 1, 29               |
|                 |                       |                |                       | Non continuous        | 11 | 29       | 11, 50              |
|                 |                       |                |                       | Irregular/Non gambler | 11 | 29       | 11, 50              |
|                 | Continuous            | 34             |                       | Probable Pathological | 0  | 0        | -                   |
|                 |                       |                |                       | Problem               | 2  | 6        | 0, 23               |
|                 |                       |                |                       | Continuous            | 8  | 24       | 8, 45               |
|                 |                       |                |                       | Non continuous        | 16 | 47       | 25, 68              |
|                 |                       |                |                       | Irregular/Non gambler | 8  | 24       | 8, 45               |
|                 | Non continuous        | 32             |                       | Probable Pathological | 0  | 0        | -                   |
|                 |                       |                |                       | Problem               | 2  | 6        | 0, 24               |
|                 |                       |                |                       | Continuous            | 2  | 6        | 0, 24               |
|                 |                       |                |                       | Non continuous        | 21 | 66       | 40, 84              |
|                 |                       |                |                       | Irregular/Non gambler | 7  | 22       | 6, 44               |
| Current SOGS-R  | Probable Pathological | Current SOGS-R | Probable Pathological | 3                     | 23 | 1, 59    |                     |
|                 |                       |                | Problem               | 4                     | 31 | 4, 67    |                     |
|                 |                       |                | Continuous            | 2                     | 15 | 0, 51    |                     |
|                 |                       |                | Non continuous        | 2                     | 15 | 0, 51    |                     |
|                 | Problem               |                | 22                    | Irregular/Non gambler | 2  | 15       | 0, 51               |
|                 |                       |                |                       | Probable Pathological | 3  | 14       | 1, 40               |
|                 |                       |                |                       | Problem               | 2  | 9        | 0, 34               |
|                 |                       |                |                       | Continuous            | 4  | 18       | 2, 45               |
|                 |                       |                |                       | Non continuous        | 9  | 41       | 14, 68              |
|                 |                       |                |                       | Irregular/Non gambler | 4  | 18       | 2, 45               |
|                 | Continuous            |                | 48                    | Probable Pathological | 2  | 4        | 0, 17               |
|                 |                       |                |                       | Problem               | 2  | 4        | 0, 17               |
|                 |                       |                |                       | Continuous            | 11 | 23       | 9, 41               |



|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|------------------|-----------------------|-----------------------|-----------------|-----------------------|-----------------------|-----------------------|-----------|-------|--------|--------|
| DSM III          | Non continuous        | 44                    |                 | Non continuous        | 23                    | 48                    | 28, 66    |       |        |        |
|                  |                       |                       |                 | Irregular/Non gambler | 10                    | 21                    | 8, 39     |       |        |        |
|                  |                       |                       |                 | Probable Pathological | 1                     | 2                     | 0, 15     |       |        |        |
|                  |                       |                       |                 | Problem               | 1                     | 2                     | 0, 15     |       |        |        |
|                  |                       |                       |                 | Continuous            | 7                     | 16                    | 4, 34     |       |        |        |
|                  |                       |                       |                 | Non continuous        | 26                    | 59                    | 37, 76    |       |        |        |
|                  |                       |                       |                 | Irregular/Non gambler | 9                     | 20                    | 7, 39     |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  | Irregular/Non Gambler | 16                    |                 | Probable Pathological | 0                     | 0                     | -         |       |        |        |
|                  |                       |                       |                 | Problem               | 1                     | 6                     | 0, 34     |       |        |        |
|                  |                       |                       |                 | Continuous            | 5                     | 31                    | 7, 62     |       |        |        |
|                  |                       |                       |                 | Non continuous        | 0                     | 0                     | -         |       |        |        |
|                  |                       |                       |                 | Irregular/Non gambler | 10                    | 63                    | 28, 87    |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  | Pathological          | 10                    | Lifetime SOGS-R | Probable Pathological | 4                     | 40                    | 5, 78     |       |        |        |
|                  |                       |                       |                 | Problem               | 1                     | 10                    | 0, 51     |       |        |        |
|                  |                       |                       |                 | Continuous            | 1                     | 10                    | 0, 51     |       |        |        |
|                  |                       |                       |                 | Non continuous        | 3                     | 30                    | 2, 71     |       |        |        |
|                  |                       |                       |                 | Irregular/Non gambler | 1                     | 10                    | 0, 51     |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  |                       |                       |                 | Current SOGS-R        | Probable Pathological | 3                     | 30        | 2, 70 |        |        |
|                  |                       |                       |                 |                       | Problem               | 0                     | 0         | -     |        |        |
|                  |                       |                       |                 |                       | Continuous            | 2                     | 20        | 0, 61 |        |        |
|                  |                       |                       |                 |                       | Non continuous        | 4                     | 40        | 6, 78 |        |        |
|                  |                       |                       |                 |                       | Irregular/Non gambler | 1                     | 10        | 0, 50 |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
| DSM IV           |                       |                       |                 |                       | Pathological          | 2                     | 20        | 0, 60 |        |        |
|                  |                       |                       |                 |                       | Problem               | 1                     | 10        | 0, 49 |        |        |
|                  |                       |                       |                 | No problem            | 7                     | 70                    | 25, 94    |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
| Non Pathological |                       |                       |                 | 133                   | Lifetime SOGS         | Probable Pathological | 14        | 11    | 5, 19  |        |
|                  |                       |                       |                 |                       |                       | Problem               | 23        | 17    | 10, 27 |        |
|                  |                       |                       |                 |                       |                       | Continuous            | 17        | 13    | 6, 22  |        |
|                  |                       |                       |                 |                       |                       | Non continuous        | 50        | 38    | 27, 49 |        |
|                  | Irregular/Non gambler | 29                    | 22              |                       |                       | 13, 32                |           |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  | Current SOGS          | Probable Pathological | 6               |                       |                       | 5                     | 1, 11     |       |        |        |
|                  |                       | Problem               | 10              |                       |                       | 8                     | 3, 15     |       |        |        |
|                  |                       | Continuous            | 27              |                       |                       | 20                    | 12, 30    |       |        |        |
|                  |                       | Non continuous        | 56              |                       |                       | 42                    | 31, 53    |       |        |        |
|                  |                       | Irregular/Non gambler | 34              |                       |                       | 26                    | 16, 36    |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  |                       | DSM IV                | Pathological    |                       |                       | 3                     | 2         | 0, 7  |        |        |
|                  |                       |                       | Problem         |                       |                       | 5                     | 4         | 1, 10 |        |        |
|                  | No problem            |                       | 125             |                       |                       | 94                    | 87, 98    |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  | AUDIT                 | Case (≥8)             | 57              |                       |                       | AUDIT                 | Case (≥8) | 35    | 61     | 45, 75 |
|                  |                       |                       |                 |                       |                       |                       | Non Case  | 22    | 39     | 24, 54 |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
| Non case         |                       | 78                    |                 | Case (≥8)             | 7                     | 9                     | 3, 19     |       |        |        |
|                  |                       |                       |                 | Non Case              | 71                    | 91                    | 80, 97    |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
| Case (≥10)       |                       | 41                    | AUDIT           | Case (≥10)            | 22                    | 54                    | 35, 71    |       |        |        |
|                  |                       |                       |                 | Non Case              | 19                    | 46                    | 28, 64    |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
| Non case         |                       | 94                    |                 | Case (≥10)            | 6                     | 6                     | 2, 14     |       |        |        |
|                  |                       |                       |                 | Non Case              | 88                    | 94                    | 85, 98    |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
|                  |                       |                       |                 |                       |                       |                       |           |       |        |        |
| GHQ              | Case                  | 31                    | GHQ             | Case                  | 8                     | 26                    | 10, 46    |       |        |        |
|                  |                       |                       |                 | Non case              | 23                    | 74                    | 51, 89    |       |        |        |
|                  |                       |                       |                 | Case                  | 12                    | 11                    | 5, 19     |       |        |        |
|                  |                       |                       |                 | Non case              | 100                   | 89                    | 80, 95    |       |        |        |

<sup>1</sup>: Confidence intervals have been rounded up or down to the closest whole member and should be treated with caution given the complex sample design. Intervals were computed using the statistical package SYSTAT (Version 5.1) and are based on an approximation by Bailey (1980). SYSTAT employs that reference's approximation number 6 with a continuity correction, which fits closely with real intervals for the binomial on even small samples and performs well when population proportions are near zero or one.

As indicated in the Methodology section, two groups of regular gamblers (people who gambled once a week or more) in 1991 were included in the study. People who met the criteria for classification as a SOGS-R defined lifetime problem or probable pathological

gambler were excluded from these groups. This meant that current problem and probable pathological gamblers were also excluded as it is not possible to score as currently problematic on the SOGS-R without also being problematic on the lifetime measure. Continuous gamblers gambled once a week or more on forms of gambling where winnings can be immediately 'reinvested' in the game. As indicated, many also gambled this frequently on non-continuous forms such as Lotto, lotteries/raffles and bets with friends. Non-continuous gamblers participated once a week or more on non-continuous forms only.

It was hypothesised that 1991 frequent continuous gamblers would be at relatively high risk for the subsequent development of gambling problems. It was further hypothesised that a substantial number of people in this group would change their gambling participation patterns from 1991 to 1998. While it was found that none of the 34 respondents in this group scored as lifetime probable pathological gamblers when re-assessed in 1998, two (6%) were classified as lifetime problem gamblers and presumably had developed their problems since 1991. Approximately a quarter retained their frequent continuous pattern of gambling participation. Nearly half became regular non-continuous gamblers and just under a quarter stopped gambling or gambled less than once a week.

It was expected that the 32 1991 frequent non-continuous gamblers would be at a lower risk than the frequent continuous gamblers with respect to the subsequent development of gambling-related problems. It was also expected that many, probably most, would retain their current gambling participation patterns and that some would shift into the regular continuous category and others become infrequent or non-gamblers. As with the continuous group, it was found in 1998 that none obtained SOGS-R scores that placed them in the probable pathological gambling category and two (6%) scored within the lifetime problem gambling range. Twenty-one (66%) remained in the frequent non-continuous category and only two (6%) moved into the frequent continuous group. Movement into the infrequent or non-gambler groups was similar to that found for the regular continuous group, namely seven individuals (22%).

The current (6 month) SOGS-R measure was expected to be considerably more responsive than the lifetime measure to changes in gambling-related problems over time. To some extent this was found to be the case with 23 percent of the 13 1991 probable pathological gamblers remaining in that category and a further 31 percent scoring within the problem gambling range when re-assessed with the current measure in 1998. The remaining 45 percent scored within the non-problem range.

With respect to current status, it is of interest that 14 percent of the 22 1991 problem gamblers moved into the probable pathological group in 1998. Over three-quarters (77%), however, shifted into one of the non-problem groups. Only nine percent retained their 1991 classification. **This suggests that the currently problematic group is very prone to change over time, with a significant minority developing more serious problems but a much larger number ceasing to experience gambling-related problems.**

Of the frequent continuous (n=48) and non-continuous (n=44) gamblers who did not report having significant current gambling problems in 1991, two people in the former group and one in the latter were classified as current probable pathological gamblers in 1998. An additional two people in the continuous group and one in the non-continuous group were problem gamblers in 1998. One of the 16 irregular/non-gambler respondents was also a problem gambler when re-assessed in 1998. It should be noted that all of these irregular/non-gambler respondents were lifetime probable pathological gamblers or problem gamblers who had experienced gambling-related problems at some time prior to 1991 but did not report sufficient symptoms during the six months prior to their 1991 interviews to be classified as currently problematic. **This suggests that regular continuous gamblers without current problems but including a number who have had problems in the past are a relatively high-risk group for the development of subsequent problems (i.e. 'relapse'). However, the sample sizes are small and these percentages should be treated with considerable caution.** The need for caution is underlined when the confidence intervals

surrounding these estimates are examined (refer to Table 6) and it is noted that these intervals would be larger if statistical adjustments could have been made to take account of the complex sample design used in the study.

Respondents who were classified as 'pathological gamblers' in 1991 on the basis of interviewer DSM-III-R ratings were also considered with respect to their 1998 current and lifetime SOGS-R scores. Only ten of the 21 1991 respondents in this category were re-interviewed in 1998. Eleven of those originally classified as 'pathological gamblers' could not be located or declined to participate in the 1998 follow-up survey. As indicated in Table 6, five of the ten contacted were lifetime problem or probable pathological gamblers in 1998 and three of these were current probable pathological gamblers.

Less stability was evident when 1998 Fisher DSM-IV scores were considered for the ten 1991 DSM-III-R defined pathological gamblers. The questions making up this scale were presented within a 12 month time frame which makes it a current measure. Only two of the ten remained in the 'pathological' gambling category and one scored within the problem gambling range. This is similar to the current SOGS-R finding for this group. However, the high attrition rate complicates interpretation. The 1998 problem gambling status of the other 11 interviewer classified pathological gamblers is not known. Respondents lost from clinical trials or longitudinal studies are generally more likely to have worse outcomes than those who are retained (Vaillant, 1995).

Of the 133 respondents classified as non-pathological on the basis of interviewer DSM-III ratings in 1991, 11 percent scored within the lifetime probable pathological gambling range when assessed with the SOGS-R in 1998. Five percent fell within the current probable pathological gambling range at this time. Larger percentages were classified as problem gamblers (17% lifetime and 8% current). Two percent were classified as current pathological gamblers on the Fisher DSM-IV scale and a further four percent as current problem gamblers - approximately half the corresponding rates obtained using the current (6 months) SOGS-R.

### **Alcohol Misuse/Problems**

In 1991, on the basis of AUDIT responses using the conventional cut-off score of eight or more, 57 of the study participants were classified as 'cases' - i.e. as being likely to be currently engaging in hazardous or harmful alcohol use. When these participants were re-assessed in 1998 using the same test and cut-off score, 35 (61%) remained cases. Nine percent of the 78 participants who were not cases in 1991 met the criteria for caseness in 1998. This is shown in Table 6 that also includes corresponding data using a higher cut-off score.

### **Psychological Disturbance**

In 1991, 31 participants were classified as cases using the GHQ-12. In other words, these people were considered highly likely to be currently experiencing clinically significant levels of psychological disturbance. In 1998, when the GHQ-12 was re-administered to this group, eight (26%) remained cases. Twelve (11%) of the 112 participants who were not GHQ-12 defined cases were symptomatic when re-assessed in 1998.

### **Assessment of the SOGS-R**

Although detailed consideration of the findings presented above is reserved for the Discussion section, a few general observations are made at this juncture. **From the lifetime SOGS-R data, it would appear that this instrument is not a reliable measure of lifetime gambling problems.** If a measure that purports to assess whether or not an individual has ever experienced a particular disorder or problem is re-administered, similar results should be obtained. In the case of the 1991 defined lifetime probable pathological gamblers, only 28 percent were similarly classified in 1998 when the SOGS-R was re-administered. This is much lower than can be considered acceptable, although it should be noted that a somewhat

more acceptable 66 percent remained within the combined lifetime problem/probable pathological gambling category. Further work is required but, on the basis of the present findings, it would appear that the 'lifetime' SOGS-R is responsive to change over time and is thus not a valid measure of lifetime pathological gambling. The major concern is that the conventional cut-off score for lifetime probable pathological gambling misses the majority of people who in fact met this criteria seven years previously. **This suggests that when used in population surveys, the lifetime SOGS-R will significantly under-estimate the number of people who have at some stage in their lives experienced serious gambling-related problems. The 'lifetime' SOGS-R and the original SOGS that also uses this time frame may in fact be a better measure of current than of lifetime problem and pathological gambling.**

The lifetime SOGS-R findings also have some relevance to the issue of incidence - the number of new cases of problem and probable pathological gambling that arose between 1991 and 1998 among those who did not have problems in 1991. For example, it was noted that 18 percent of people who scored as lifetime problem gamblers in 1991 were classified as lifetime probable pathological gamblers when re-assessed in 1998. This suggests that a significant minority of people who had experienced some problems prior to 1991 developed more serious gambling-related problems during the next seven years. However, since it appears that the lifetime SOGS-R misses many people who have experienced serious problems in the past, this is presumably a conservative estimate. While the current (6 months) SOGS-R measure provides an assessment of those currently experiencing problems (i.e in 1998), it does not yield information about the problem gambling status of participants between 1991 and 1997.

Although none of the 66 frequent gamblers who did not score within the lifetime problem or probable pathological gambling range on the SOGS-R in 1991 were classified as lifetime probable pathological gamblers when re-assessed in 1998, four (6%) were identified as lifetime problem gamblers. Assuming that the current combined problem/pathological gambling population prevalence falls somewhere between 0.5 and 3.0 percent, it is evident that much larger samples are required to assess the incidence of problem and pathological gambling with any confidence.

The present findings also suggest that SOGS-R defined current probable pathological gambling and GHQ-12 defined mental disorder have similar chronicity. The GHQ-12 is also a current measure. Approximately a quarter of people identified as cases on these instruments remained cases when re-assessed on the same measure seven years later. A similar picture emerged for the DSM-III-R interviewer assessed pathological gamblers when they were re-assessed seven years later with the Fisher DSM-IV Screen. The problem gambling and mental disorder measures display a lower degree of chronicity than was found in the present study for participants identified as having alcohol-related problems. Using an AUDIT cut-off score of eight, sixty-one percent of 1991 cases remained cases in 1998. This figure dropped slightly to 54 percent when the higher cut-off of ten was used.

### **Probable Pathological Gambler Sample**

Table 7 provides additional information on changes on selected measures within the 1991 defined lifetime probable pathological gambler sub-sample.

Mean SOGS-R lifetime and current continuous scores are provided in Table 7. The score reductions from 1991 to 1998 are consistent with the findings outlined and discussed briefly above with respect to changes in the percentages of probable pathological gamblers in this sub-sample.

Other than gaming machine participation outside casinos, which diminished greatly, other changes in gambling preference, participation, usual session length and expenditure were of marginal significance. In the 1991 study, gaming machine participation was an important risk

factor for problem and probable pathological gambling. Total reported median monthly gambling expenditure was \$65 in 1991 and \$70 in 1998.

A large number of respondents in this sub-sample continued to engage in excessive and hazardous alcohol consumption (54% in 1991; 40% in 1998). This apparent reduction was not statistically significant. There was no change in self-rated health. However, both mean GHQ-12 scores and the percentage of respondents who were classified as experiencing clinically significant levels of psychological disturbance (i.e. cases) on this measure reduced appreciably. A third met the criteria for caseness in 1991. This fell to ten percent in 1998. Both reductions were statistically significant.

### **Problem Gambling Sample**

Table 8 summarises changes on selected measures within this sample.

As with the probable pathological group, statistically significant score reductions on the SOGS-R lifetime and current continuous measures were evident.

Other than a significant reduction in frequent participation in Instant Kiwi and gaming machines outside casinos, no other statistically significant changes were found for preferred forms of gambling, gambling participation or gambling expenditure. Total median monthly gambling expenditure was \$47.50 in 1991 and \$44.50 in 1998. A statistically significant increase in the length of typical gambling sessions was found for the small number of respondents who reported gambling on horse and/or dog races in 1991 and 1998.

Although there were reductions in AUDIT and GHQ-12 mean scores and in the number of clinical cases, these changes were not statistically significant. The apparent change in self-rated health was not significant.

### **Frequent Continuous and Frequent Non-continuous Samples**

Changes on selected measures for these two sub-samples are summarised in Tables 9 and 10. From these tables, it is evident that there were no significant changes within the two non-problem gambling sub-samples with respect to the problem gambling and other clinical measures. The only significant change for the different types of gambling pertained to Instant Kiwi. Both groups evidenced less frequent participation in 1998. The non-continuous group also reported spending significantly more on all gambling activities combined. However, this change was not large in magnitude and does not take account of inflation.

### **Reasons for Gambling, Self Perceived Changes in Gambling and Reasons Given for these Changes**

Respondents were asked why they gambled in 1991. This question was repeated in 1998. On both occasions respondents could give more than one reason. Reasons given by respondents, in descending 1991 rank order, were: to win money (1991, 78%; 1998, 72%), for entertainment or fun (52%; 46%), for excitement or challenge (39%; 23%), as a hobby (23%; 13%), socialising (24%; 8%), to support worthy causes (16%; 9%), spur of the moment (8%; 2%) and inbred/hooked (4%; 4%). These differences were not formally tested for statistical significance. However, some of the changes are likely to be significant, especially those that were found in 1991 to be associated with probable pathological and problem gambling, e.g. for excitement/challenge and as a hobby.

In 1998, respondents were also asked how their current overall gambling involvement compared with their involvement at the time of the 1991 survey. Forty-three percent said it had stayed much the same. The remainder indicated that they considered that it had changed in some way. Specifically, two percent said it had increased a lot, 23 percent that it had increased a little, 15 percent that it had decreased a little and 18 percent that it had decreased a lot. These findings appear to be generally consistent with the reductions in

frequency of participation in some forms of gambling, most notably Instant Kiwi, other lotteries/raffles, horses/dog and gaming machines (non-casino) outlined in Table 5.

Reasons given for increases in gambling from 1991 to 1998 included more finances/better income (20%), more opportunities/options (10%), something to do/a day out (7%), others they know increased gambling (6%) and accessibility (6%).

**Table 7. 1991 Baseline and 1998 Follow-up Characteristics - Probable Pathological Gamblers (N=39)<sup>1</sup>**

| Characteristic                                    | 1991 Baseline | 1998 Follow-up | P Value <sup>6</sup> |
|---|---------------|----------------|----------------------|
| Married/ Living with partner (%)                  | 68            | 76             | .508                 |
| Lifetime SOGS-R Type                              |               |                |                      |
| Probable Pathological (%)                         | 100           | 28             |                      |
| Problem (%)                                       | 0             | 38             |                      |
| Continuous (%)                                    | 0             | 10             |                      |
| Non continuous (%)                                | 0             | 13             |                      |
| Irregular/Non Gambler                             | 0             | 10             |                      |
| Lifetime SOGS-R Score <sup>2</sup>                | 6.8 (±2.2)    | 4.0 (±3.6)     | <.001                |
| Current SOGS-R Type                               |               |                | .036                 |
| Probable Pathological (%)                         | 33            | 13             |                      |
| Problem (%)                                       | 21            | 18             |                      |
| Continuous (%)                                    | 18            | 28             |                      |
| Non Continuous (%)                                | 10            | 26             |                      |
| Irregular/Non Gambler (%)                         | 18            | 15             |                      |
| Current SOGS-R Score                              | 3.0 (±2.5)    | 2.0 (±2.8)     | .020                 |
| Preferred gambling                                |               |                |                      |
| Lotto (%)   | 36            | 56             | .057                 |
| Instant Kiwi (%)                                  | 8             | 0              | -                    |
| Other lotteries, or raffles                       | 0             | 0              | -                    |
| Horses/Dogs (%)                                   | 36            | 26             | .125                 |
| Gaming machines (non casino) (%)                  | 5             | 3              | 1.000                |
| Casinos   | 0             | 0              |                      |
| Frequently bet                                    |               |                |                      |
| Lotto (%)   | 87            | 85             | 1.000                |
| Instant Kiwi (%)                                  | 54            | 31             | .064                 |
| Other Lotteries, raffles (%)                      | 54            | 31             | .049                 |
| Horses/Dogs (%)                                   | 51            | 39             | .063                 |
| Gaming machines (non casino) (%)                  | 31            | 5              | .002                 |
| Casinos (%)                                       | 0             | 3              | -                    |
| Daily Keno (%)                                    | -             | 13             | -                    |
| TeleBingo (%)                                     | -             | 18             | -                    |
| Dollars spent per month <sup>3</sup>              |               |                |                      |
| Lotto (N = 29) <sup>4</sup>                       | 20            | 20             | .976                 |
| Instant Kiwi (N = 19) <sup>4</sup>                | 8             | 5              | .026                 |
| Other lotteries, raffles (N = 23) <sup>4</sup>    | 5             | 5              | .303                 |
| Horses/Dogs (N = 14) <sup>4</sup>                 | 65            | 60             | .263                 |
| Gaming machines (non casino) (N = 8) <sup>4</sup> | 20            | 15             | .260                 |
| Casinos (N = 9) <sup>4</sup>                      | -             | 10             | -                    |
| Daily Keno (N = 9) <sup>4</sup>                   | -             | 12             | -                    |
| TeleBingo (N = 14) <sup>4</sup>                   | -             | 7.5            | -                    |
| All gambling activities                           | 65            | 70             | .917                 |
| Usual session length (mins) <sup>3</sup>          |               |                |                      |
| Lotto (N = 29) <sup>5</sup>                       | 5             | 5              | .909                 |
| Instant Kiwi (N = 7) <sup>5</sup>                 | 3             | 1              | .168                 |
| Other lotteries/raffles (N = 8) <sup>5</sup>      | 3             | 2              | .273                 |
| Horses/Dogs (N = 15) <sup>5</sup>                 | 60            | 120            | .433                 |
| Gaming machines (non casino) (N = 2) <sup>5</sup> | 30            | 40             | -                    |
| Casinos (N = 1) <sup>5</sup>                      | -             | 120            | -                    |
| Daily Keno (N = 5) <sup>5</sup>                   | -             | 5              | -                    |
| TeleBingo (N = 7) <sup>5</sup>                    | -             | 30             | -                    |
| AUDIT Case ≥ 10 (%)                               | 54            | 40             | .180                 |

|                                |                   |                   |      |
|--------------------------------|-------------------|-------------------|------|
| AUDIT Score <sup>2</sup>       | 9.7 ( $\pm 6.5$ ) | 9.2 ( $\pm 7.4$ ) | .393 |
| GHQ Case (%)                   | 33                | 10                | .022 |
| GHQ Score <sup>2</sup>         | 2.3 ( $\pm 3.3$ ) | .8 ( $\pm 1.2$ )  | .013 |
| Self-rated Health <sup>2</sup> | 1.2 ( $\pm .5$ )  | 1.3 ( $\pm .6$ )  | .248 |

<sup>1</sup>Numbers in the groups for the AUDIT variables were slightly lower due to missing values.

<sup>2</sup>Values are means (SD).

<sup>3</sup>Values are medians.

<sup>4</sup>Sample sizes are smaller as the data relate only to respondents who had spent money on the activity during the past 6 months at both assessments, or, in the case of Casinos, Daily Keno and TeleBingo, during the 6 months prior to follow-up.

<sup>5</sup>Sample sizes are smaller as the data related only to respondents who frequently gambled on the activity at both assessments, or in the case of Casinos, Daily Keno and TeleBingo, frequently gambled on the activity at follow-up.

<sup>6</sup>McNemar and Bowker's chi-square tests were undertaken for changes in categorical variables and Wilcoxon signed ranks tests for continuous variables.

**Table 8. 1991 Baseline and 1998 Follow-up Characteristics - Problem Gamblers (N=38)<sup>1</sup>**

| Characteristic                                  | 1991 Baseline | 1998 Follow-up | P Value <sup>6</sup> |
|---|---------------|----------------|----------------------|
| Married/ Living with partner (%)                | 55            | 66             | .424                 |
| Lifetime SOGS-R Type                            |               |                |                      |
| Probable Pathological (%)                       | 0             | 18             |                      |
| Problem (%)                                     | 100           | 13             |                      |
| Continuous (%)                                  | 0             | 11             |                      |
| Non continuous (%)                              | 0             | 29             |                      |
| Irregular/Non Gambler                           | 0             | 29             |                      |
| Lifetime SOGS-R Score <sup>2</sup>              | 3.3 (±.5)     | 2.5 (±.2.5)    | .012                 |
| Current SOGS-R Type                             |               |                |                      |
| Probable Pathological (%)                       | 0             | 11             |                      |
| Problem (%)                                     | 37            | 5              |                      |
| Continuous (%)                                  | 21            | 16             |                      |
| Non Continuous (%)                              | 18            | 34             |                      |
| Irregular/Non Gambler (%)                       | 24            | 34             |                      |
| Current SOGS-R Score                            | 2.1 (±.1.1)   | 1.3 (±.1.9)    | .020                 |
| Preferred gambling                              |               |                |                      |
| Lotto (%)                                       | 34            | 50             | .180                 |
| Instant Kiwi (%)                                | 11            | 3              | .375                 |
| Other lotteries, or raffles                     | 5             | 3              | 1.000                |
| Horses/Dogs (%)                                 | 18            | 18             | 1.000                |
| Gaming machines (non casino) (%)                | 13            | 5              | .453                 |
| Casinos (%)                                     | 0             | 3              | -                    |
| Frequently bet                                  |               |                |                      |
| Lotto (%)                                       | 84            | 89             | .688                 |
| Instant Kiwi (%)                                | 61            | 34             | .013                 |
| Other Lotteries, raffles (%)                    | 34            | 16             | .092                 |
| Horses/Dogs (%)                                 | 37            | 26             | .289                 |
| Gaming machines (non casino) (%)                | 32            | 8              | .012                 |
| Casinos (%)                                     | 0             | 8              | -                    |
| Daily Keno (%)                                  | -             | 5              | -                    |
| TeleBingo (%)                                   | -             | 24             | -                    |
| Dollars spent per month <sup>3</sup>            |               |                |                      |
| Lotto (N=33) <sup>4</sup>                       | 20            | 20             | .731                 |
| Instant Kiwi (N=22) <sup>4</sup>                | 5             | 5              | .851                 |
| Other lotteries, raffles (N=18) <sup>4</sup>    | 5             | 5              | .506                 |
| Horses/Dogs (N=5) <sup>4</sup>                  | 50            | 50             | 1.000                |
| Gaming machines (non casino) (N=6) <sup>4</sup> | 9             | 7.5            | .715                 |
| Casinos (N = 8) <sup>4</sup>                    | -             | 7.5            | -                    |
| Daily Keno (N = 3) <sup>4</sup>                 | -             | 20             | -                    |
| TeleBingo (N = 14) <sup>4</sup>                 | -             | 8              | -                    |
| All gambling activities                         | 47.5          | 44.5           | .170                 |
| Usual session length (mins) <sup>3</sup>        |               |                |                      |
| Lotto (N=30) <sup>5</sup>                       | 5             | 5              | .577                 |
| Instant Kiwi (N=11) <sup>5</sup>                | 3             | 5              | .140                 |
| Other lotteries, raffles (N=3) <sup>5</sup>     | 5             | 5              | 1.00                 |
| Horses/Dogs (N=8) <sup>5</sup>                  | 105           | 240            | .018                 |
| Gaming machines (non casino) (N=2) <sup>5</sup> | 105           | 50             | -                    |
| Casinos (N = 3) <sup>5</sup>                    | -             | 60             | -                    |
| Daily Keno (N = 2) <sup>5</sup>                 | -             | 4              | -                    |
| TeleBingo (N = 9) <sup>5</sup>                  | -             | 30             | -                    |
| AUDIT Case ≥ 10 (%)                             | 29            | 21             | .508                 |
| AUDIT Score <sup>2</sup>                        | 8.2 (±5.8)    | 6.6 (±5.5)     | .238                 |
| GHQ Case (%)                                    | 32            | 21             | .344                 |
| GHQ Score <sup>2</sup>                          | 2.4 (±3.5)    | 1.5 (±2.4)     | .065                 |
| Self-rated Health <sup>2</sup>                  | 1.2 (±.4)     | 1.4 (±.6)      | .064                 |

<sup>1</sup>Numbers in the groups for the AUDIT variables were slightly lower due to missing values.

<sup>2</sup>Values are means (SD).

<sup>3</sup>Values are medians.



<sup>4</sup>Sample sizes are smaller as the data relate only to respondents who had spent money on the activity during the past 6 months at both assessments, or, in the case of Casinos, Daily Keno and TeleBingo, during the 6 months prior to follow-up.

<sup>5</sup>Sample sizes are smaller as the data related only to respondents who frequently gambled on the activity at both assessments, or in the case of Casinos, Daily Keno and TeleBingo, frequently gambled on the activity at follow-up.

<sup>6</sup>McNemar and Bowker's chi-square tests were undertaken for changes in categorical variables and Wilcoxon signed ranks tests for continuous variables.

**Table 9. 1991 Baseline and 1998 Follow-up Characteristics - Continuous Gamblers (N=34)<sup>1</sup>**

| Characteristic                                  | 1991 Baseline | 1998 Follow-up | P Value <sup>6</sup> |
|---|---------------|----------------|----------------------|
| Married/ Living with partner (%)                | 65            | 65             | 1.000                |
| Lifetime SOGS-R Type                            |               |                |                      |
| Probable Pathological (%)                       | 0             | 0              |                      |
| Problem (%)                                     | 0             | 6              |                      |
| Continuous (%)                                  | 100           | 24             |                      |
| Non continuous (%)                              | 0             | 47             |                      |
| Irregular/Non Gambler                           | 0             | 24             |                      |
| Lifetime SOGS-R Score <sup>2</sup>              | .4 (±.7)      | .6 (±1.0)      | .206                 |
| Current SOGS-R Type                             |               |                |                      |
| Probable Pathological (%)                       | 0             | 0              |                      |
| Problem (%)                                     | 0             | 3              |                      |
| Continuous (%)                                  | 97            | 24             |                      |
| Non Continuous (%)                              | 3             | 47             |                      |
| Irregular/Non Gambler (%)                       | 0             | 27             |                      |
| Current SOGS-R Score                            | .3 (±.6)      | .4 (±.9)       | .470                 |
| Preferred gambling                              |               |                |                      |
| Lotto (%)                                       | 50            | 68             | .146                 |
| Instant Kiwi (%)                                | 12            | 3              | .375                 |
| Other lotteries, or raffles                     | 3             | 0              | -                    |
| Horses/Dogs (%)                                 | 9             | 9              | 1.000                |
| Gaming machines (non casino) (%)                | 9             | 3              | .500                 |
| Casinos (%)                                     | 3             | 15             | .125                 |
| Frequently bet                                  |               |                |                      |
| Lotto (%)                                       | 77            | 88             | .344                 |
| Instant Kiwi (%)                                | 77            | 35             | <.001                |
| Other Lotteries, raffles (%)                    | 41            | 21             | .092                 |
| Horses/Dogs (%)                                 | 15            | 12             | 1.000                |
| Gaming machines (non casino) (%)                | 21            | 9              | .125                 |
| Casinos (%)                                     | 6             | 18             | .219                 |
| Daily Keno (%)                                  | -             | 0              | -                    |
| TeleBingo (%)                                   | -             | 12             | -                    |
| Dollars spent per month <sup>3</sup>            |               |                |                      |
| Lotto (N=33) <sup>4</sup>                       | 20            | 20             | .360                 |
| Instant Kiwi (N=17) <sup>4</sup>                | 5             | 4              | .178                 |
| Other lotteries, raffles (N=19) <sup>4</sup>    | 4             | 5              | .794                 |
| Horses/Dogs (N=5) <sup>4</sup>                  | 10            | 6              | .854                 |
| Gaming machines (non casino) (N=3) <sup>4</sup> | 10            | 80             | .180                 |
| Casinos (N = 7) <sup>4</sup>                    | -             | 20             | -                    |
| Daily Keno (N = 1) <sup>4</sup>                 | -             | 5              | -                    |
| TeleBingo (N = 10) <sup>4</sup>                 | -             | 4              | -                    |
| All gambling activities                         | 37.5          | 35             | .114                 |
| Usual session length (mins) <sup>3</sup>        |               |                |                      |
| Lotto (N=23) <sup>5</sup>                       | 5             | 2              | .584                 |
| Instant Kiwi (N=12) <sup>5</sup>                | 4             | 5              | .102                 |
| Other lotteries, raffles (N=4) <sup>5</sup>     | 4             | 2              | .109                 |
| Horses/Dogs (N=2) <sup>5</sup>                  | 180           | 165            | -                    |
| Gaming machines (non casino) (N=3) <sup>5</sup> | 33            | 120            | -                    |
| Casinos (N = 6) <sup>5</sup>                    | -             | 150            | -                    |
| Daily Keno (N = 0) <sup>5</sup>                 | -             | -              | -                    |
| TeleBingo (N = 4) <sup>5</sup>                  | -             | 30             | -                    |
| AUDIT Case ≥ 10 (%)                             | 19            | 6              | .125                 |
| AUDIT Score <sup>2</sup>                        | 5.6 (±5.3)    | 5.0 (±5.6)     | .238                 |
| GHQ Case (%)                                    | 6             | 21             | .125                 |

|                                |           |            |      |
|--------------------------------|-----------|------------|------|
| GHQ Score <sup>2</sup>         | .7 (±1.7) | 1.3 (±2.6) | .232 |
| Self-rated Health <sup>2</sup> | 1.1 (±.2) | 1.2 (±.5)  | .157 |

<sup>1</sup>Numbers in the groups for the AUDIT variables were slightly lower due to missing values.

<sup>2</sup>Values are means (SD).

<sup>3</sup>Values are medians.

<sup>4</sup>Sample sizes are smaller as the data relate only to respondents who had spent money on the activity during the past 6 months at both assessments, or, in the case of Casinos, Daily Keno and TeleBingo, during the 6 months prior to follow-up.

<sup>5</sup>Sample sizes are smaller as the data relate only to respondents who frequently gambled on the activity at both assessments, or in the case of Casinos, Daily Keno and TeleBingo, frequently gambled on the activity at follow-up.

<sup>6</sup>McNemar and Bowker's chi-square tests were undertaken for changes in categorical variables and Wilcoxon signed ranks tests for continuous variables.

**Table 10. 1991 Baseline and 1998 Follow-up Characteristics - Non Continuous Gamblers (N=32)<sup>1</sup>**

| Characteristic                                  | 1991 Baseline | 1998 Follow-up | P Value <sup>6</sup> |
|---|---------------|----------------|----------------------|
| Married/ Living with partner (%)                | 63            | 75             | .344                 |
| Lifetime SOGS-R Type                            |               |                |                      |
| Probable Pathological (%)                       | 0             | 0              |                      |
| Problem (%)                                     | 0             | 6              |                      |
| Continuous (%)                                  | 0             | 6              |                      |
| Non continuous (%)                              | 100           | 66             |                      |
| Irregular/Non Gambler                           | 0             | 22             |                      |
| Lifetime SOGS-R Score <sup>2</sup>              | .3 (±.5)      | .4 (±1.0)      | .577                 |
| Current SOGS-R Type                             |               |                |                      |
| Probable Pathological (%)                       | 0             | 0              |                      |
| Problem (%)                                     | 0             | 0              |                      |
| Continuous (%)                                  | 0             | 13             |                      |
| Non Continuous (%)                              | 100           | 66             |                      |
| Irregular/Non Gambler (%)                       | 0             | 22             |                      |
| Current SOGS-R Score                            | .2 (±.4)      | .3 (±.6)       | .589                 |
| Preferred gambling                              |               |                |                      |
| Lotto (%)                                       | 78            | 63             | .302                 |
| Instant Kiwi (%)                                | 6             | 3              | 1.000                |
| Other lotteries, or raffles                     | 0             | 6              | -                    |
| Horses/Dogs (%)                                 | 3             | 6              | 1.000                |
| Gaming machines (non casino) (%)                | 6             | 0              | -                    |
| Casinos (%)                                     | 0             | 9              | -                    |
| Frequently bet                                  |               |                |                      |
| Lotto (%)                                       | 100           | 91             | -                    |
| Instant Kiwi (%)                                | 44            | 19             | .021                 |
| Other Lotteries, raffles (%)                    | 41            | 28             | .289                 |
| Horses/Dogs (%)                                 | 16            | 9              | .625                 |
| Gaming machines (non casino) (%)                | 13            | 6              | .688                 |
| Casinos (%)                                     | 0             | 13             | -                    |
| Daily Keno (%)                                  | -             | 6              | -                    |
| TeleBingo (%)                                   | -             | 13             | -                    |
| Dollars spent per month <sup>3</sup>            |               |                |                      |
| Lotto (N=28) <sup>4</sup>                       | 20            | 20             | .104                 |
| Instant Kiwi (N=14) <sup>4</sup>                | 5             | 2              | .964                 |
| Other lotteries, raffles (N=18) <sup>4</sup>    | 5             | 5              | .244                 |
| Horses/Dogs (N=1) <sup>4</sup>                  | -             | -              | -                    |
| Gaming machines (non casino) (N=4) <sup>4</sup> | 1             | 15             | .068                 |
| Casinos (N = 6) <sup>4</sup>                    | -             | 20             | -                    |
| Daily Keno (N = 2) <sup>4</sup>                 | -             | 3              | -                    |
| TeleBingo (N = 6) <sup>4</sup>                  | -             | 4.5            | -                    |
| All gambling activities                         | 26.5          | 32             | .047                 |
| Usual session length (mins)                     |               |                |                      |
| Lotto (N=29) <sup>5</sup>                       | 5             | 5              | .704                 |
| Instant Kiwi (N=5) <sup>5</sup>                 | 2             | 5              | .068                 |
| Other lotteries, raffles (N=7) <sup>5</sup>     | 3             | 2              | .598                 |
| Horses/Dogs (N=2) <sup>5</sup>                  | 35            | 155            | -                    |
| Gaming machines (non casino) (N=0) <sup>5</sup> | -             | -              | -                    |
| Casinos (N = 4) <sup>5</sup>                    | -             | 135            | -                    |
| Daily Keno (N = 2) <sup>5</sup>                 | -             | 5              | -                    |
| TeleBingo (N = 4) <sup>5</sup>                  | -             | 30             | -                    |

|                                |                   |                   |       |
|--------------------------------|-------------------|-------------------|-------|
| AUDIT Case $\geq 10$ (%)       | 17                | 13                | 1.000 |
| AUDIT Score <sup>2</sup>       | 4.4 ( $\pm 4.0$ ) | 4.1 ( $\pm 4.6$ ) | .626  |
| GHQ Case (%)                   | 13                | 3                 | .375  |
| GHQ Score <sup>2</sup>         | .8 ( $\pm 1.9$ )  | .5 ( $\pm 1.0$ )  | .383  |
| Self-rated Health <sup>2</sup> | 1.1 ( $\pm 3$ )   | 1.1 ( $\pm 3$ )   | 1.000 |

<sup>1</sup>Numbers in the groups for the AUDIT variables were slightly lower due to missing values.

<sup>2</sup>Values are means (SD).

<sup>3</sup>Values are medians.

<sup>4</sup>Sample sizes are smaller as the data relate only to respondents who had spent money on the activity during the past 6 months at both assessments, or, in the case of Casinos, Daily Keno and TeleBingo, during the 6 months prior to follow-up.

<sup>5</sup>Sample sizes are smaller as the data relate only to respondents who frequently gambled on the activity at both assessments, or in the case of Casinos, Daily Keno and TeleBingo, frequently gambled on the activity at follow-up.

<sup>6</sup>McNemar and Bowker's chi-square tests were undertaken for changes in categorical variables and Wilcoxon signed ranks tests for continuous variables.

Reasons given for decreases in gambling included: lack of finances (27%), change of environment/lifestyle (13%), awareness/older and wiser (10%), lack of interest/not involved now (10%), don't go out as much/live in country (9%), other priorities - marriage, family etc (6%) and less time/too busy (5%).

Respondents who said that their gambling had changed in some way were also asked if these changes were associated with any specific events or stages in their lives. The most frequently reported associations were changes in financial situation (26%), marriage/having a family/grandchild (16%), gambling environment changed (11%), came to senses (8%), new forms of gambling/venues (7%) and relationship/marriage breakup (6%). Twenty-seven percent said that the changes in their gambling were not associated with specific events. These reasons were not separated for people who increased and decreased their gambling.

In the remainder of this section, selected data are considered in relation to subgroups, especially the 1991 lifetime probable pathological and problem gamblers who, in 1998, reported significant changes in aspects of their gambling and gambling-related behaviour.

Of the four gambling/problem gambling categories, respondents in the 1991 lifetime probable pathological and problem groups were most likely to indicate that they believed their overall gambling involvement had changed from 1991 to 1998. This is in keeping with the classification, participation and costs and benefits data presented in this report. Changes in self-assessed gambling participation are shown in Figure 4.

Only 26 percent of the 39 1998 respondents who were classified in 1991 as lifetime probable pathological gamblers considered that their overall gambling involvement was much the same as in 1991. Thirty-seven percent of the 38 problem gamblers shared this perception. In contrast, 50 percent of the 34 continuous gamblers and 63 percent of the 32 non-continuous gamblers believed that their gambling involvement was unchanged.

With respect to the direction of change, nearly a third (31%) of lifetime probable pathological gamblers thought that their level of involvement had decreased a lot. Eighteen percent considered that it had decreased a little and 26 percent that it had increased a little. None were of the view that it had increased substantially.

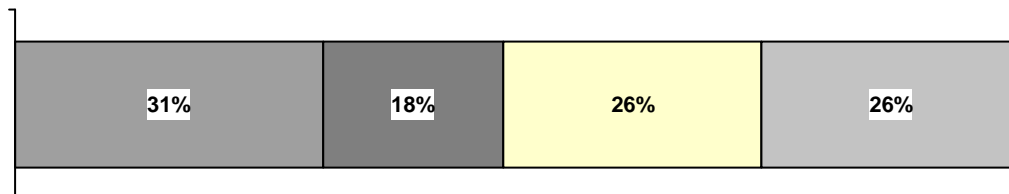
Twenty-four percent of the 38 lifetime problem gamblers thought that their levels of involvement had decreased a lot and 11 percent thought they had decreased a little. Twenty-four percent also thought it had increased a little and only two (5%) considered that it had increased a lot.

As indicated, the 66 respondents in the two 1991 non-problem groups reported less change. Only one respondent in these groups considered that their gambling had increased a lot and relatively few considered that it had decreased a lot (approximately 6%). The continuous group was much more likely to indicate slight decreases (27%) than the non-continuous group (3%). On the other hand, the non-continuous group was somewhat more likely to indicate slight increases (25%) than the continuous group (18%).

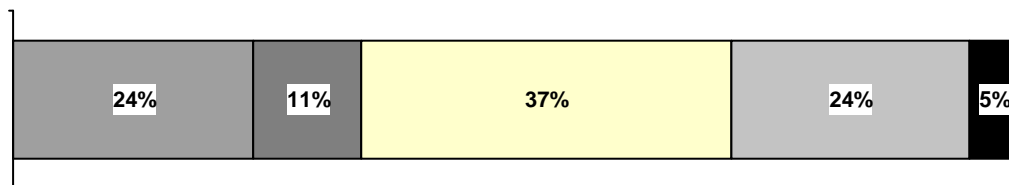
To summarise, this self assessment information suggests that with respect to overall gambling involvement, the two problem groups displayed the greatest degree of change from 1991 to 1998, with a significant minority of respondents reporting marked reductions and a somewhat smaller number noting slight increases. The two non-problem, frequent gambling groups reported greater stability over time, with most staying much the same but with a significant minority of continuous gamblers decreasing a little and a similar proportion of non-continuous gamblers increasing a little.

**Figure 4: Self Assessed Changes in Gambling Participation for Participants in each of the Major 1991 Gambling/Problem Gambling Groups**

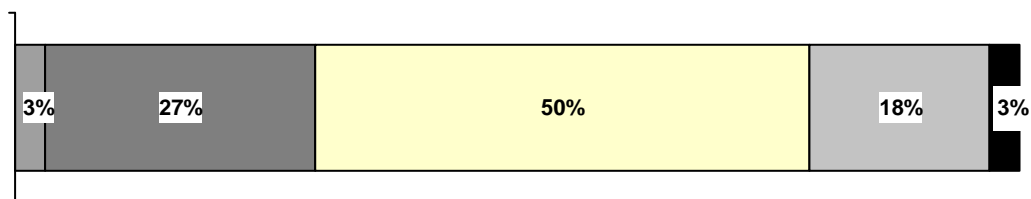
**1991 Lifetime Probable Pathological Gamblers (n= 39)**



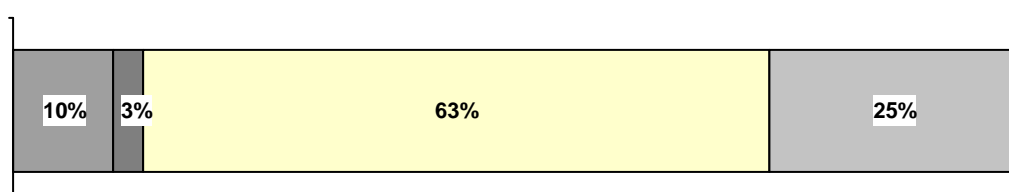
**1991 Lifetime Problem Gamblers (n= 38)**



**1991 Regular Continuous Gamblers (n= 34)**



**1991 Regular Non-Continuous Gamblers (n= 32)**



Given the relatively large number of probable pathological and problem gamblers indicating through their self assessments and various reports of gambling participation, expenditure and problem severity, that their gambling engagement reduced, interest focuses on why this reduction took place. The 45 respondents who indicated that their gambling involvement had decreased since 1991 were asked what they thought led to this decrease. They could give multiple reasons, which were subsequently classified by the researchers.

The most frequently mentioned reasons given by the 19 probable pathological gamblers who reported decreased gambling were 'lack of finances/financial reasons' (68%), 'awareness/older and wiser' (32%), 'don't go out as much/live in the country' (21%), 'change of environment/lifestyle' (16%), 'lack of interest/not involved now' (16%) and 'other priorities - marriage/family etc' (11%). Financial reasons for reduced gambling involvement were cited somewhat less frequently by the other groups, namely problem gamblers 23 percent, continuous gamblers 50 percent and non-continuous gamblers 33 percent.

Fifteen percent of the problem gamblers but none of the non-problem respondents mentioned 'awareness/older but wiser' as a reason for decreased gambling. Twenty-three percent of the problem group also mentioned other priorities – 'marriage/family etc' and fifteen percent mentioned 'remarks from family/friends'. No non-problem participants mentioned either of these reasons.

Reasons most frequently given by the continuous group included 'lack of interest/not involved now' (30%), 'don't go out as much/live in the country' (30%), 'change of environment/lifestyle' (20%) and 'less time/too busy' (20%).

As indicated above, only a small number of non-continuous gamblers, three individuals, indicated a reduction in their gambling involvement.

Reasons given for reductions in gambling participation are summarised in Figure 5. Because of the relatively small number of respondents in some groups, the two problem gambling groups are combined, as are the two non-problem groups.

Probable pathological gamblers and problem gamblers also mentioned a number of specific events and life stages that they considered were associated with changes to their gambling activities. From the phrasing of this particular question it is unclear whether the change referred to was an increase or decrease in gambling. Specifically, the following were mentioned:

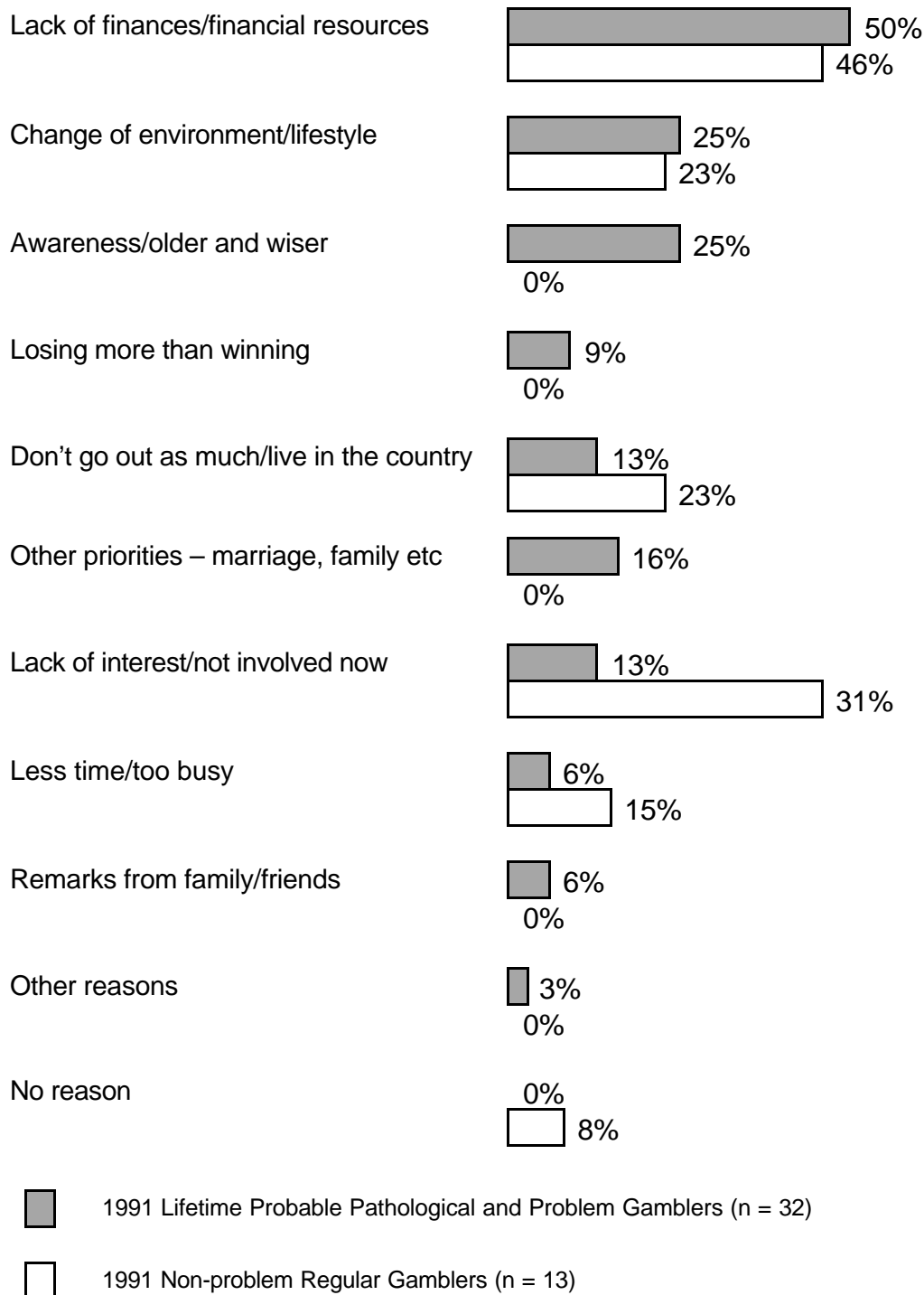
- Change of financial situation (probable pathological gamblers 30%; problem gamblers 21%)
- Marriage/having a family/grandchildren (17%; 21%)
- Came to senses (17%; 11%)
- Relationship/marriage breakup (13%; 5%)
- Gambling environment changed (13%, 11%)
- Shifted within New Zealand/change of residence (9%, 0%).

A somewhat different pattern of events was mentioned by the continuous and non-continuous gamblers:

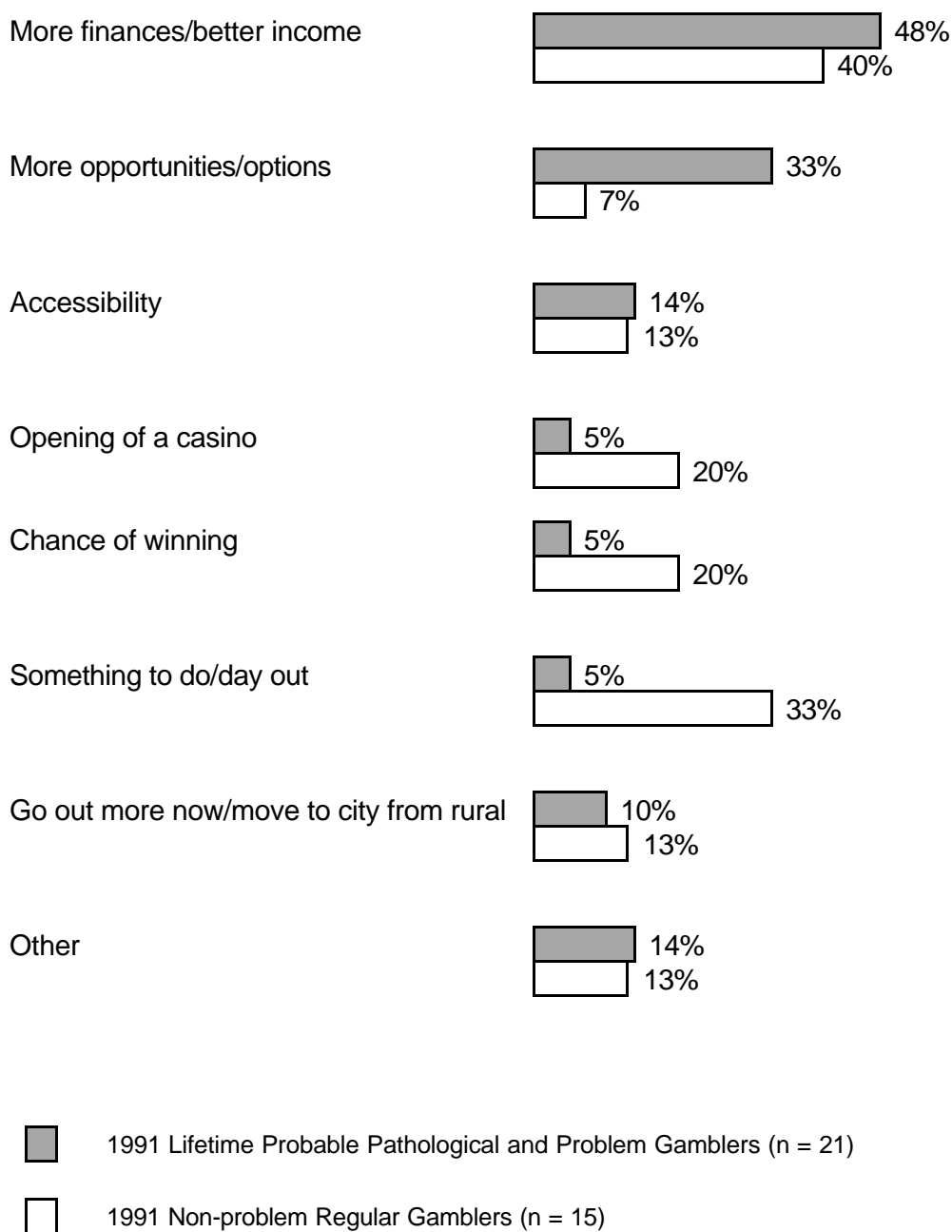
- Change of financial situation (continuous gamblers 33%; non-continuous gamblers 19%)
- Marriage/having a family/grandchildren (20%; 6%)
- New forms of gambling/venues (13%; 19%)
- Ill health/disabled (13%; 0%)

- Children independent/wife back to work (13%; 6%)
- Gambling environment changed (13%; 6%).

**Figure 5: Reasons Given by Participants in the 1991 Lifetime Problem and Non-problem Groups for Reductions in Gambling Participation**



**Figure 6: Reasons Given by Participants in the 1991 Lifetime Problem and Non-Problem Groups for Increases in Gambling Participation**



None of the non-problem respondents mentioned 'came to senses' or 'relationship/marriage break-up' as reasons for changes in their gambling involvement.

Thirty-six participants reported that their overall gambling involvement had increased since 1991. These participants were asked what had led to their increased participation. As with the question concerning decreased involvement, multiple responses could be given to this open-ended question. This information is presented in Figure 6. Like Figure 5, responses from the two problem groups are combined. So too are the responses from the non-problem groups.

Increased income or a better financial situation was the most frequently mentioned reason for an increase in gambling participation. This applied to all four groups. There appeared to be differences between the problem and non-problem groups with respect to some reasons given for increased involvement. People in the problem groups (33%) were more likely than

those in the non-problem groups (7%) to say that more gambling opportunities or options led to participation increases. Non-problem respondents (33%) were more likely than their problem gambler counterparts (5%) to attribute increased involvement to 'something to do/a day out'. Non-problem respondents also somewhat more frequently mentioned that the opening of a casino or the chance of winning led to increased involvement. Each of these reasons was given by 20 percent of non-problem gamblers, but by only 5 percent of problem/probable pathological gamblers.

## **Perceived Costs and Benefits of Gambling and Problem Gambling**

Questions about costs and benefits of gambling administered in phase two of the 1991 survey were re-administered in 1998. Specialist statistical advice is being sought to determine whether the quality of the sample and data will allow detailed multivariate analyses to be undertaken with a view to developing separate scales based on commonalities or constructs that underlie sets of related questions. If so, these constructs or 'latent variables' will be examined to determine whether or not they are meaningful and stable entities. If they are, they will be further considered in relation to a number of the sociodemographic, gambling participation and problem gambling variables. The original questions and any scales derived from them will also be examined in an additional specialist paper that will consider the matter of recall and retrospective interpretation of gambling-related events and experiences that respondents were asked to describe in both 1991 and 1998.

An overview of responses to this set of questions is provided in Appendix Two. For each question, 1991 responses are presented for the original 1991 phase two respondents (n = 217), 1991 responses for participants who were subsequently re-interviewed in 1998 (n = 143) and 1998 responses for this re-interviewed sample (n = 143). The responses are cross-tabulated by the major 1991 respondent categories, namely lifetime probable pathological gamblers, lifetime problem gamblers, regular continuous gamblers and regular non-continuous gamblers.

Some preliminary findings from this part of the study are outlined here, under the headings for each group of questions. Formal tests of statistical significance have not been conducted on this section of the data.

## **Personal Pleasures and Costs of Gambling**

**Overall, a majority of participants, in both 1991 and 1998, reported that “gambling has been a hobby and an interest for me”, that “I have daydreamed about getting a big win” and that “my gambling has given me pleasure and fun”.** A somewhat smaller majority indicated likewise, in both 1991 and 1998, for the six months immediately preceding the respective surveys. However, in 1998, the percentages in some categories were substantially smaller than in 1991. For example, in 1991, 82 percent of lifetime probable pathological gamblers said they had at least sometimes thought about getting a big win within the past six months. In 1998, the corresponding percentage was 64 percent. Similarly, in 1991, 84 percent of respondents in this category said gambling had given them fun and pleasure. This dropped to 69 percent in 1998. Apart from regular and non-continuous gamblers, quite large reductions were also evident for the other categories (refer to Appendix Two, Table 1). These changes appear to be consistent with reductions in regular gambling participation in these groups.

Relatively lower percentages reported that the various 'cost' items applied to them, either in their entire lifetimes or during the past six months.

As expected, probable pathological gamblers and problem gamblers were much more likely than participants in either of the two non-problem groups to acknowledge that they had at least sometimes experienced negative consequences associated with their gambling. For example, in both 1991 and 1998, approximately a half of probable pathological gamblers and a quarter of problem gamblers indicated that when they finished gambling they felt guilty. While



there was consistency over time in responses to this question, quite marked differences were found from 1991 to 1998 for many of the other 'negative' lifetime items. Large reductions were evident from 1991 to 1998 for probable pathological gamblers with respect to the following:

'When I felt depressed I used gambling to escape' (1991, 36%; 1998, 13%)

'I felt that my gambling was a problem' (1991, 33%; 1998, 15%)

'After losing at gambling I felt depressed' (1991, 56%; 1998, 33%).

Less change was evident for problem gamblers on these questions, with the exception of feeling depressed after losing (37%; 8%). Very few respondents in the non-problem gambling categories said that they had ever experienced any of these negative experiences.

These findings are potentially important as they refer to lifetime measures. In both 1991 and 1998, participants were asked if they had ever had these experiences. **The findings suggest that probable pathological gamblers, and perhaps problem gamblers to a lesser extent, are inconsistent over time in the recall or perception of at least some of their past negative gambling-related experiences. On the other hand, their positive gambling-related experiences appear to show more consistency over time.**

Reductions in reports of negative experiences were also substantial for probable pathological gamblers when the three questions highlighted above were repeated in the past six month format. This finding is consistent with a reduction in current problem gambling symptomatology (as reflected in lower SOGS-R scores) over time within this group.

The question "I went for help with my gambling" was included in this set of questions. Only one respondent (within the problem gambling group) acknowledged having 'occasionally' ever done so. This was in 1991. This respondent did not indicate having sought help in the past when the question was repeated in 1998.

## **Interpersonal/Family**

Relative to the continuous gambling participants, probable pathological and problem gamblers were more likely in 1991 and 1998, to report that their gambling had given them something to talk about with their family and friends and that they had gone gambling with their friends. This applied to both lifetime and past six months phrasing of these questions. Among other things, this suggests that gambling continues to play a part in the lives of many probable pathological and problem gamblers, irrespective of whether or not they continue to experience gambling-related problems.

**Lifetime probable pathological and problem gamblers were also much more likely than their non-problem counterparts to acknowledge negative gambling-related experiences associated with their family and social life.**

A notable feature of responses to this set of questions was the marked change that was evident between the baseline and follow-up surveys. With respect to the pleasures and costs questions mentioned above, moderate to large reductions were found in all four participant groups, on both the lifetime and current presentations. The lifetime finding suggests that frequent gamblers as well as probable pathological and problem gamblers lack consistency over time when reporting aspects of their gambling behaviour and related experiences. It would be useful to examine these findings further to identify factors that predict changed performance on lifetime measures. Subsequent gambling experience and problems (i.e. at the time of a follow-up survey) may be significant. Some consideration is given to this matter in later sections of this report.

With regard to the lifetime probable pathological gamblers, and to some extent problem gamblers, lifetime reductions were also evident for a number of the 'negative' questions. For example, in 1991, 44 percent of probable pathological gamblers acknowledged that their

friends or family had ever criticised their gambling and 26 percent indicated likewise for having told lies about their gambling. In 1998, only 28 percent and 10 percent respectively, indicated that this had ever been the case.

Very few respondents acknowledged in 1991 that they had ever experienced any of the negative family and social experiences during the six months prior to the baseline survey and similar results pertained at the 1998 followup.

## **Vocational/Employment**

As in the proceeding section, lifetime probable pathological gamblers and problem gamblers were generally much more likely than their non-problem counterparts to report having ever experienced a variety of positive and negative gambling-related experiences.

In 1991, 41 percent of lifetime probable pathological gamblers and 29 percent of problem gamblers indicated that thinking about gambling had, at some time, helped them get through a boring job. Corresponding percentages for frequent continuous and non-continuous gamblers were six and nine percent respectively. Less marked differences were evident for some other work-related gambling experiences. For example, in 1991, approximately two-thirds of probable pathological gamblers, a half of problem gamblers and just under a third of those in the two non-problem groups indicated that "gambling is something we all talk about at work." Approximately a half of probable pathological and problem gamblers and a third of non-problem gamblers said they had "gone gambling with people from work". Relatively small numbers of probable pathological gamblers reported, in 1991, having ever experienced adverse work consequences or experiences associated with their gambling. Those most frequently mentioned by people in this category included:

'I have lost time from work/study due to gambling' (18%)

'Thinking about my gambling has stopped me working efficiently at my job' (18%).

Smaller numbers of problem gamblers (11% and 8% respectively) and very few non-problem gamblers, only one or two individuals, indicated that they had ever experienced these outcomes. Only one respondent said that gambling problems had resulted in moving or changing jobs and none reported having lost their job because of gambling. Hardly any participants reported, in either 1991 or 1998, having had adverse work-related gambling experiences during the six months prior to being interviewed.

As noted in the two previous sections, substantial reductions were found with respect to the number of people who responded affirmatively to a number of the lifetime questions in 1998, relative to 1991. Apart from reported reductions in having gone gambling with people from work, which dropped markedly from 1991 to 1998 in all four participant groups, again these changes were most evident for probable pathological gamblers. In part this was probably due to the aging of the sample and increase in the number no longer in the paid work force.

With respect to current (i.e. past six months) experience, both in 1991 and 1998, few or no respondents replied affirmatively to most of the work-related questions. An exception was gambling having helped in getting through a boring job. Twenty-one percent of both probable pathological and problem gamblers said this sometimes or more often had applied to them in 1991. This number dropped slightly in 1998 to 15 and 13 percent respectively, a change that is unlikely to be statistically significant.

Talking about gambling at work and participating in gambling with workmates were other questions that a number of participants responded to affirmatively. In the case of probable pathological gamblers, the percentages decreased substantially for both questions from 1991 and 1998. This was also the case for frequent non-continuous gamblers. With respect to talking about gambling at work, no change was evident for problem gamblers, and frequent continuous gamblers reported that this activity increased. Like probable pathological gamblers, problem gamblers reported a reduction in gambling participation with workmates in

1998. Very low numbers of frequent continuous gamblers, in either survey, reported having recently "gone gambling with people from work".

## **Financial**

As with questions in the previous sections, responses to the financial questions appear to differentiate the two problem gambling groups from the non-problem groups. This is particularly so for responses to the lifetime questions, including the following:

- 'I have spent more than I could afford on my gambling'
- 'I have gambled to try and win money to pay off debts.'

On some questions, however, frequent continuous gamblers responded similarly to probable pathological and problem gamblers, and differed from frequent non-continuous gamblers. In 1991, similar percentages of problem gamblers and frequent continuous gamblers said winning at gambling had helped them financially, that they had won more than they had lost at gambling, and that they had had a "big win" from gambling.

Again, there were discrepancies between lifetime responses to some questions in 1991 and 1998. As in the previous sections, these differences were generally most evident in the case of probable pathological gamblers, who reported fewer negative outcomes in 1998. From 1991 to 1998 major reductions were found for having spent more than could be afforded on gambling (51% in 1991; 18% in 1998) and having gambled to try to win money to pay off debts (31%; 15%).

The frequency of affirmative responses to the financial questions framed in the six month format were too low to be able to discern any major differences between the different groups or over time.

## **Legal**

Few individuals indicated that they had ever engaged in illegal activity in relation to their gambling or problem gambling. Only one respondent said gambling had led to problems with the police. None disclosed having appeared in court or been in prison because of gambling-related crimes.

## **Gambling Characteristics**

Based on 1991 lifetime responses, most of the questions in this section appear to differentiate the two problem groups, especially probable pathological gamblers, from the non-problem groups. For the majority of questions, probable pathological gamblers most frequently answer in the affirmative, followed in declining response frequency by problem gamblers, frequent continuous gamblers and frequent non-continuous gamblers.

Relative to the other three groups, probable pathological gamblers were much more likely to indicate that they had:

- 'Gone back another day, after losing, to win back their money'
- 'Believed that their gambling is skilful'
- 'Gambled for longer than planned'
- 'Gone on gambling longer if they had urgent debts.'

Relative to the two non-problem groups, both the probable pathological and problem gambler groups were more likely to acknowledge that they had:

- 'Expected to win each time they started to gamble'
- 'Felt like stopping gambling but didn't think they could'
- 'Felt excited when gambling'
- 'Felt relaxed when gambling'
- 'Gambled when they had a disappointing or frustrating day'

'Gambled if they had had good luck and wanted to celebrate'  
'Gone on gambling despite having lost, if they were excited.'

Most of these differences, although generally somewhat less, were also evident in 1991, when the questions were presented in the past six months format.

Some of these findings are consistent with the hypothesis that pathological gamblers have impaired control of their gambling behaviour. They also point to a number of emotional and cognitive differences between the reactions of problem gamblers and non-problem gamblers with respect to their gambling involvement.

As with a number of questions in the previous sections, there were reductions in affirmative responses to many questions in this section from 1991 to 1998. This applied to both lifetime and past six months questions.

Reductions in the number of participants responding affirmatively to some particular lifetime questions were substantial. For example, in 1991, 67 percent of probable pathological gamblers reported 'chasing' ("after losing at gambling I have gone back another day to win back my money"). In 1998, only 13 percent responded likewise. From Appendix Two, Table 6, it is evident that participants in the other three groups also reported reductions in chasing. It is also apparent that somewhat similar patterns of change were evident for a number of other gambling characteristics questions.

Contrary to expectations, less change was evident on most of the current gambling characteristics questions than when they were presented in the lifetime format. Nevertheless, substantial reductions were found in chasing (37 percent among probable pathological gamblers in 1991; 8 percent in 1998) and expectations of winning (74 percent among probable pathological gamblers in 1991; 46 percent in 1998). These findings are consistent with the earlier current SOGS-R score reductions and indicate a reduction in problematic gambling behaviours and some associated cognitive distortions. However, it should be noted that little or no change was evident for probable pathological gamblers on some measures, e.g. considering that their gambling was skilful, gambling longer than intended and feeling like stopping but not thinking that they could.

One item, namely "each time I started to gamble I expected to win", was responded to affirmatively by large numbers of survey participants within all four groups, albeit that the numbers reduced in 1998 relative to 1991. On the other hand, the great majority of respondents in these groups, in both years, indicated that they lost more gambling than they won. This suggests the widespread occurrence of an erroneous belief with respect to the probability of winning. Examination of relationships between changes in beliefs about winning and reductions in both gambling participation and problem gambling will be examined further in a subsequent paper. This may provide a useful focal point for community and school education programmes about gambling and problem gambling.

## **Conclusion**

The findings summarised in this section, while they are tentative and should be treated with caution until examined more formally using appropriate statistical procedures, do point to a variety of both positive and negative experiences associated with frequent gambling participation. Generally, both general types of experience are more apparent for people within the two problem gambler groups.

Another important finding was the divergent lifetime reports of a number of gambling-related experiences from 1991 to 1998. In most cases, change over time was in the direction of lower percentages of people acknowledging particular experiences or outcomes. While increases could be expected in lifetime accounts, reductions should not occur when lifetime questions are repeated in a subsequent survey of the same people. However, this was also

evident with respect to changes in lifetime SOGS-R classifications and mean scores (refer to Table 5).

The reductions from 1991 to 1998 in the percentage of affirmative responses to a number of the questions when presented in the current (past six months) format in both surveys are consistent with the substantial increase in the percentage of survey participants who moved into the current frequent non-continuous and irregular/non-gambler categories in 1998. These reductions are also consistent with the statistically significant decline in the number of current probable pathological and problem gamblers and lower mean SOGS-R scores in the followup survey.

### **Problem Gambling in Others, Help Seeking and Related Matters**

Participants were asked a variety of questions about problem gambling and help seeking behaviours. This included whether or not they knew other people who have had a problem with gambling. In 1998, 10 percent of 1991 lifetime probable pathological gambler respondents and six percent of the total group of respondents said other people living with them had, or previously had, gambling problems. Probable pathological gamblers were also more likely to report that other family members had had gambling problems (36% compared with 22% for the sample as a whole, including probable pathological gamblers). **Over half of the total group of respondents (52%) indicated that they knew other people who have had problems. There was no significant change between 1991 and 1998 in the number of participants who reported knowing other people with problems.**

In 1998, twelve (8%) of the total respondents said that they had sought help for friends or family members who they thought might have a gambling problem. Nine respondents had indicated likewise when interviewed in 1991. In 1998, family, friends or work-mates were mentioned by eight people as sources of potential help that they had contacted in this regard. Five mentioned Gamblers Anonymous. General medical practitioners and mental health professionals were each mentioned by three people. The numbers of survey respondents reporting help seeking was too small to discern any change in pattern from 1991 to 1998.

In 1998, participants who acknowledged that they, themselves, had at some time had a problem with gambling were asked how old they were when they first noticed they had a problem. Only 16 respondents acknowledged that they currently or in the past had had a gambling problem. Eleven of these people were lifetime probable pathological gamblers and four were problem gamblers. **The mean age given for first noticing that they had a problem was 28 years** (however it must be remembered that respondents were now aged 25 or over).

The 16 respondents who acknowledged personal gambling problems were asked if there had been times when they had been free or mostly free of gambling problems for six months or more. Three respondents said they had not had problem-free times. The remaining 13 said they had had problem-free periods. During these times nine said they had reduced their gambling participation (7 of the 9 were probable pathological gamblers; 2 problem gamblers), three indicated that they had changed their gambling in some other way and one reported having stopped gambling altogether.

The 13 respondents who reported problem-free periods were asked how many such periods they had experienced. Five of the 13 respondents indicated having experienced more than six problem-free or largely problem-free periods and three reported having had between two and four such periods.

The 13 respondents who said they had had problem-free periods were also asked how they had overcome their problems during these periods. All 13 said through their own efforts. Multiple responses could be given to this question and a checklist of options was provided. Other reasons given by one respondent each included 'in prison', 'help from family', 'help from

friends' and 'other'. They were also asked which of these was the main way in which they overcame or significantly reduced their gambling problems. Twelve said it was through their own efforts, one from family support. In addition, they were asked if they had received help for gambling problems from those listed in the checklist at any other stage in their life. Only two indicated that they had sought such help, in one case from family and the other from friends. Both said these sources had been very helpful in coping with their gambling problems. The remaining eleven had not sought or received help. **None of the respondents who acknowledged having had problems at some time reported ever having personally consulted a health or other professional or a specialist mutual help organisation such as GA.**

The 13 participants were also asked if they had ever returned to having problems with their gambling following a problem-free or largely problem-free period. Although most of this group had indicated having multiple problem-free or largely problem free periods of six months or more, only two said they had ever returned to having problems with their gambling following one of these periods.

**The findings reported in this section, together with earlier information on changes in gambling behaviour and problem gambling status, strongly suggest that problem gambling is more episodic in nature than had previously been thought.**

### **Happiness and Satisfaction with Life Generally**

This question was asked only in the 1998 follow-up survey. In 1998, the great majority of respondents indicated that they were generally very satisfied (48%) or satisfied (46%) with their lives. A small number (4%) said they were somewhat dissatisfied. One respondent reported being very dissatisfied.

1991 defined lifetime probable pathological gamblers and problem gamblers (39% and 40% respectively) were somewhat less likely than frequent continuous and non-continuous non-problematic gamblers (53% and 66% respectively) to indicate that they were very satisfied. Only the frequent continuous gamblers included a significant minority of people (15%) who said they were dissatisfied or very dissatisfied.

### **Associations between Selected Measures in 1991 and 1998 and between Changes on some Measures**

Changes in gambling participation and classification from 1991 to 1998 have been considered. The present section provides information on associations between a number of major variables at each of the two assessment points for participants included in the present study. It also provides a summary of analyses that examined associations between changes over time on some of these measures. Non-parametric (Spearman rho) correlations were employed to assess relationships between continuous variables. Chi-square tests and phi correlations were used to assess relationships between nominal measures.

#### **Major Measures in 1991**

Non-parametric inter-correlations between major variables assessed in 1991 are tabulated in Table 11. The results of these analyses are presented here to allow comparisons to be made with the pattern of relationships between major measures in 1998. This information is also important because performance on a number of 1991 measures is included later in models to predict problem gambling outcomes in 1998.

It was expected that the various problem gambling measures (lifetime and current SOGS-R and DSM-III-R interviewer ratings) would show moderate to high inter-correlation. It was further hypothesised that :

- the lifetime SOGS-R and DSM-III-R ratings would be more strongly correlated than the current SOGS-R and DSM-III-R ratings
- performance on each of these problem gambling measures would correlate moderately and significantly with performance on the other clinical measures, namely the AUDIT and GHQ-12, as well as with self-rated health, and
- performance on the problem gambling measures would be related to higher expenditure on continuous forms of gambling and overall gambling expenditure.

From inspection of Table 11, there appears to be corroboration for most of these conjectures. The lifetime and six months SOGS-R showed moderate levels of correlation, as did the lifetime SOGS-R and DSM-III-R ratings. The relationship between the SOGS-R current measure and DSM-III-R ratings was somewhat weaker but still statistically significant.

Both alcohol problems (AUDIT) and higher degrees of psychological disturbance (GHQ-12) were correlated with increased levels of gambling problems on the SOGS-R measures and DSM-III-R ratings. Their relationships with self-rated health were weak and non-significant.

Overall gambling expenditure per month was significantly associated with problem gambling on all three measures. Apart from Instant Kiwi, higher expenditure on the other major forms of gambling was correlated with higher scores on one or more of the three problem gambling indices. Alcohol problems also showed generally weak but statistically significant correlation with some of the gambling expenditure measures.

Varying degrees of association were found between expenditure levels on the major categories of gambling and all major categories correlated moderately to strongly with overall gambling expenditure.

## **Major Measures in 1998**

Similar associations were evident between the three problem gambling measures administered in 1998 (refer to Table 12). On this occasion, the Fisher DSM-IV Screen was substituted for the DSM-III-R interviewer ratings. In contrast to the interviewer ratings, this screen showed a somewhat higher correlation with past six months SOGS-R performance than it did with performance on the lifetime measure. This was expected because the Fisher DSM-IV Screen, in contrast to the interviewer ratings, is a current measure of problem gambling. The three measures appear to share approximately 30 to 50 percent common variance. This suggests that while they in large part assess the same underlying construct, they are not identical measures.

As in 1991, the AUDIT (a measure of problematic or hazardous alcohol use) correlated significantly with the three problem gambling measures and with overall monthly gambling expenditure. However, in contrast to 1991, GHQ-12 performance (i.e. higher psychological disturbance) did not correlate significantly with these three measures or with higher AUDIT scores.

**Table 11: Nonparametric (Spearman's Rho) Correlations Between 1991 Measures**

|   |                 | Current SOGS-R<br>score | Interviewer<br>rating score<br>(DSM-III-R) | AUDIT score | GHQ       | Self-rated health | Amount per<br>month...Lotto | Amount per<br>month...Instant<br>Kiwi | Amount per<br>month...Horse/d<br>og races | Amount per<br>month...Gaming<br>machines | Amount per<br>month...all<br>activities |
|---|-----------------|-------------------------|--|-------------|-----------|-------------------|-----------------------------|---------------------------------------|---|--|---|
| Lifetime SOGS-R score                   | Correlation     | .655(**)                | -.542(**)                                  | .336(**)    | .200(**)  | .089              | .158(*)                     | .132                                  | .169                                      | .444(**)                                 | .365(**)                                |
|   | Sig. (2-tailed) | .000                    | .000                                       | .000        | .003      | .191              | .025                        | .100                                  | .179                                      | .000                                     | .000                                    |
|   | N               | 217                     | 217  | 211         | 217       | 217               | 202                         | 157                                   | 65  | 58                                       | 212                                     |
| Current SOGS-R score                    | Correlation     |                         | -.410(**)                                  | .289(**)    | .215(**)  | .044              | .099                        | .098                                  | .303(*)                                   | .400(**)                                 | .424(**)                                |
|   | Sig. (2-tailed) |                         | .000                                       | .000        | .001      | .522              | .162                        | .224                                  | .014                                      | .002                                     | .000                                    |
|   | N               |                         | 217  | 211         | 217       | 217               | 202                         | 157                                   | 65  | 58                                       | 212                                     |
| Interviewer rating score<br>(DSM-III-R) | Correlation     |                         |  | -.357(**)   | -.186(**) | -.120             | -.238(**)                   | -.090                                 | -.429(**)                                 | -.299(*)                                 | -.407(**)                               |
|   | Sig. (2-tailed) |                         |  | .000        | .006      | .077              | .001                        | .261                                  | .000                                      | .023                                     | .000                                    |
|   | N               |                         |  | 211         | 217       | 217               | 202                         | 157                                   | 65  | 58                                       | 212                                     |
| AUDIT score                             | Correlation     |                         |  |             | .159(*)   | .046              | .094                        | .071                                  | -.037                                     | .380(**)                                 | .237(**)                                |
|   | Sig. (2-tailed) |                         |  |             | .021      | .502              | .192                        | .384                                  | .771                                      | .003                                     | .001                                    |
|   | N               |                         |  |             | 211       | 211               | 196                         | 153                                   | 63  | 58                                       | 206                                     |
| GHQ                                     | Correlation     |                         |  |             |           | .292(**)          | -.024                       | -.062                                 | .005                                      | .099                                     | .027                                    |
|   | Sig. (2-tailed) |                         |  |             |           | .000              | .730                        | .441                                  | .966                                      | .461                                     | .698                                    |
|   | N               |                         |  |             |           | 217               | 202                         | 157                                   | 65  | 58                                       | 212                                     |
| Self-rated health                       | Correlation     |                         |  |             |           |                   | -.095                       | -.005                                 | .095                                      | -.055                                    | .025                                    |
|   | Sig. (2-tailed) |                         |  |             |           |                   | .180                        | .950                                  | .449                                      | .681                                     | .714                                    |
|   | N               |                         |  |             |           |                   | 202                         | 157                                   | 65  | 58                                       | 212                                     |
| Amount per month<br>...Lotto            | Correlation     |                         |  |             |           |                   |                             | .319(**)                              | .302(*)                                   | .086                                     | .608(**)                                |
|   | Sig. (2-tailed) |                         |  |             |           |                   |                             | .000                                  | .018                                      | .541                                     | .000                                    |
|   | N               |                         |  |             |           |                   |                             | 151                                   | 61  | 53                                       | 201                                     |
| Amount per month<br>...Instant Kiwi     | Correlation     |                         |  |             |           |                   |                             |                                       | .193                                      | .391(**)                                 | .460(**)                                |
|   | Sig. (2-tailed) |                         |  |             |           |                   |                             |                                       | .174                                      | .007                                     | .000                                    |
|   | N               |                         |  |             |           |                   |                             |                                       | 51  | 46                                       | 156                                     |
| Amount per month<br>...Horse/dog races  | Correlation     |                         |  |             |           |                   |                             |                                       |   | -.067                                    | .778(**)                                |
|   | Sig. (2-tailed) |                         |  |             |           |                   |                             |                                       |   | .746                                     | .000                                    |
|   | N               |                         |  |             |           |                   |                             |                                       |   | 26                                       | 65                                      |
| Amount per month<br>...Gaming machines  | Correlation     |                         |  |             |           |                   |                             |                                       |   |  | .517(**)                                |
|   | Sig. (2-tailed) |                         |  |             |           |                   |                             |                                       |   |  | .000                                    |
|   | N               |                         |  |             |           |                   |                             |                                       |   |  | 58                                      |

\*\* Correlation is significant at the .01 level (2-tailed).

\* Correlation is significant at the .05 level (2-tailed).



**Table 12: Nonparametric (Spearman's Rho) Correlations Between 1998 Measures**

|   |                 | Current SOGS-R<br>score 1998 | DSM-IV score | AUDIT score | GHQ 1998 | Self-rated health | Amount per<br>month...Lotto | Amount per<br>month...Instant<br>Kiwi | Amount per<br>month...Horses/<br>dogs | Amount per<br>month... non<br>casino gaming | Amount per<br>month 1998...all<br>activities |
|---|-----------------|------------------------------|--------------|-------------|----------|-------------------|-----------------------------|---------------------------------------|---------------------------------------|---|--|
| Lifetime SOGS-R score 1998                | Correlation     | .700(**)                     | .532(**)     | .342(**)    | -.002    | .063              | -.009                       | .176                                  | .387(**)                              | .127  | .436(**)                                     |
|   | Sig. (2-tailed) | .000                         | .000         | .000        | .983     | .456              | .918                        | .112                                  | .007                                  | .469  | .000   |
|   | N               | 143                          | 143          | 140         | 143      | 143               | 129                         | 83                                    | 48                                    | 35  | 142  |
| Current SOGS score 1998                   | Correlation     |                              | .580(**)     | .235(**)    | .017     | .023              | .072                        | .217(*)                               | .570(**)                              | .270  | .516(**)                                     |
|   | Sig. (2-tailed) |                              | .000         | .005        | .843     | .786              | .416                        | .049                                  | .000                                  | .117  | .000   |
|   | N               |                              | 143          | 140         | 143      | 143               | 129                         | 83                                    | 48                                    | 35  | 142  |
| DSM-IV score                              | Correlation     |                              |              | .278(**)    | -.053    | .000              | .067                        | .236(*)                               | .475(**)                              | .360(*)                                     | .464(**)                                     |
|   | Sig. (2-tailed) |                              |              | .001        | .528     | .997              | .453                        | .031                                  | .001                                  | .034  | .000   |
|   | N               |                              |              | 140         | 143      | 143               | 129                         | 83                                    | 48                                    | 35  | 142  |
| Audit score                               | Correlation     |                              |              |             | -.059    | .003              | .047                        | .162                                  | .237                                  | .330  | .257(**)                                     |
|   | Sig. (2-tailed) |                              |              |             | .486     | .967              | .601                        | .151                                  | .113                                  | .053  | .002   |
|   | N               |                              |              |             | 140      | 140               | 126                         | 80                                    | 46                                    | 35  | 139  |
| GHQ 1998                                  | Correlation     |                              |              |             |          | .313(**)          | -.058                       | .059                                  | -.094                                 | -.028                                       | .006   |
|   | Sig. (2-tailed) |                              |              |             |          | .000              | .513                        | .597                                  | .523                                  | .873  | .943   |
|   | N               |                              |              |             |          | 143               | 129                         | 83                                    | 48                                    | 35  | 142  |
| Self-rated health                         | Correlation     |                              |              |             |          |                   | -.107                       | .066                                  | -.038                                 | -.107                                       | .037   |
|   | Sig. (2-tailed) |                              |              |             |          |                   | .229                        | .556                                  | .796                                  | .540  | .659   |
|   | N               |                              |              |             |          |                   | 129                         | 83                                    | 48                                    | 35  | 142  |
| Amount per month<br>...Lotto              | Correlation     |                              |              |             |          |                   |                             | .217                                  | .151                                  | .081  | .508(**)                                     |
|   | Sig. (2-tailed) |                              |              |             |          |                   |                             | .052                                  | .317                                  | .667  | .000   |
|   | N               |                              |              |             |          |                   |                             | 81                                    | 46                                    | 31  | 129  |
| Amount per month<br>...Instant Kiwi       | Correlation     |                              |              |             |          |                   |                             |                                       | .179                                  | .465(*)                                     | .506(**)                                     |
|   | Sig. (2-tailed) |                              |              |             |          |                   |                             |                                       | .334                                  | .034  | .000   |
|   | N               |                              |              |             |          |                   |                             |                                       | 31                                    | 21  | 83   |
| Amount per month<br>...Horses/dogs        | Correlation     |                              |              |             |          |                   |                             |                                       |                                       | .209  | .652(**)                                     |
|   | Sig. (2-tailed) |                              |              |             |          |                   |                             |                                       |                                       | .455  | .000   |
|   | N               |                              |              |             |          |                   |                             |                                       |                                       | 15  | 48   |
| Amount per month<br>... non casino gaming | Correlation     |                              |              |             |          |                   |                             |                                       |                                       |   | .632(**)                                     |
|   | Sig. (2-tailed) |                              |              |             |          |                   |                             |                                       |                                       |   | .000   |
|   | N               |                              |              |             |          |                   |                             |                                       |                                       |   | 35   |

\*\* Correlation is significant at the .01 level (2-tailed).

• Correlation is significant at the .05 level (2-tailed).

**Table 13: Nonparametric (Spearman's Rho) Correlations Between Change Scores (1991-1998)**

|   |                 | Current SOGS-R<br>change | AUDIT change | GHQ change | Self-rated health<br>change | Amt per mth<br>Lotto change | Amt per mth<br>Instant Kiwi<br>change | Amt per mth<br>Horse/Dog<br>change | Amt per mth non<br>casino gaming<br>mach. change | Amt per mth All<br>activities<br>change |
|---|-----------------|--------------------------|--------------|------------|-----------------------------|-----------------------------|---------------------------------------|------------------------------------|--|---|
| Lifetime SOGS-R change                        | Correlation     | .605(**)                 | .025         | .073       | -.155                       | -.109                       | .052                                  | .276                               | .394   | .173(*)                                 |
|   | Sig. (2-tailed) | .000                     | .775         | .383       | .065                        | .229                        | .665                                  | .181                               | .077   | .041                                    |
|   | N               | 143                      | 135          | 143        | 143                         | 123                         | 72                                    | 25                                 | 21   | 140                                     |
| Current SOGS-R change                         | Correlation     |                          | .028         | -.039      | -.219(**)                   | -.050                       | -.087                                 | .398(*)                            | .103   | .225(**)                                |
|   | Sig. (2-tailed) |                          | .743         | .643       | .009                        | .583                        | .469                                  | .048                               | .656   | .007                                    |
|   | N               |                          | 135          | 143        | 143                         | 123                         | 72                                    | 25                                 | 21   | 140                                     |
| AUDIT change                                  | Correlation     |                          |              | -.055      | .079                        | .079                        | -.186                                 | .044                               | .126   | .184(*)                                 |
|   | Sig. (2-tailed) |                          |              | .529       | .365                        | .399                        | .131                                  | .850                               | .585   | .035                                    |
|   | N               |                          |              | 135        | 135                         | 115                         | 67                                    | 21                                 | 21   | 132                                     |
| GHQ change                                    | Correlation     |                          |              |            | .201(*)                     | .015                        | .298(*)                               | .073                               | .137   | .012                                    |
|   | Sig. (2-tailed) |                          |              |            | .016                        | .870                        | .011                                  | .728                               | .552   | .890                                    |
|   | N               |                          |              |            | 143                         | 123                         | 72                                    | 25                                 | 21   | 140                                     |
| Self-rated health change                      | Correlation     |                          |              |            |                             | .056                        | .104                                  | -.343                              | .006   | .044                                    |
|   | Sig. (2-tailed) |                          |              |            |                             | .541                        | .384                                  | .093                               | .980   | .606                                    |
|   | N               |                          |              |            |                             | 123                         | 72                                    | 25                                 | 21   | 140                                     |
| Amt per mth Lotto change                      | Correlation     |                          |              |            |                             |                             | -.039                                 | .441(*)                            | -.241  | .583(**)                                |
|   | Sig. (2-tailed) |                          |              |            |                             |                             | .748                                  | .035                               | .320   | .000                                    |
|   | N               |                          |              |            |                             |                             | 69                                    | 23                                 | 19   | 123                                     |
| Amt per mth Instant Kiwi change               | Correlation     |                          |              |            |                             |                             |                                       | .059                               | .347   | .313(**)                                |
|   | Sig. (2-tailed) |                          |              |            |                             |                             |                                       | .834                               | .296   | .007                                    |
|   | N               |                          |              |            |                             |                             |                                       | 15                                 | 11   | 72                                      |
| Amt per mth Horse/Dog change                  | Correlation     |                          |              |            |                             |                             |                                       |                                    | -1.000(**)                                       | .826(**)                                |
|   | Sig. (2-tailed) |                          |              |            |                             |                             |                                       |                                    | .000   | .000                                    |
|   | N               |                          |              |            |                             |                             |                                       |                                    | 3  | 25                                      |
| Amt per mth non casino gaming<br>mach. change | Correlation     |                          |              |            |                             |                             |                                       |                                    |  | .595(**)                                |
|   | Sig. (2-tailed) |                          |              |            |                             |                             |                                       |                                    |  | .004                                    |
|   | N               |                          |              |            |                             |                             |                                       |                                    |  | 21                                      |

\*\* Correlation is significant at the .01 level (2-tailed).

• Correlation is significant at the .05 level (2-tailed).

Expenditure on horse and dog racing and overall gambling expenditure were both moderately correlated with higher current and lifetime SOGS-R scores and DSM-IV scores.

In 1998, all gambling measures included were moderately correlated with the aggregate expenditure measure.

### **Changes on Selected Measures from 1991 to 1998**

Table 13 shows the degree to which the various measures listed changed together (co-varied) over time between the two assessment points.

From inspection of Table 13, it is evident that the current and lifetime SOGS-R change scores were moderately correlated. In other words, they display a moderately strong tendency to change together over time. Relatively small but statistically significant correlations between change in overall gambling expenditure and current SOGS-R change were found. There was also a somewhat stronger correlation between reductions in track betting expenditure and lowered current SOGS-R scores. There was a slight tendency for reductions in current SOGS-R scores to be associated with improved self-rated health.

Self-rated health improvement was slightly but significantly correlated with GHQ-12 improvement. GHQ-12 improvement was also correlated modestly with reduced Instant Kiwi expenditure.

No change scores other than overall gambling expenditure were found to be associated with change on the AUDIT. Although statistically significant, this relationship was weak. Among other things, this suggests that alcohol-related problems and problem gambling changed independently over time.

Some forms of gambling were found to be more likely than others to change together over time, e.g. non-casino gaming machine participation and track betting

### **The Prediction of 1998 Current Problem and Probable Pathological Gambling Status**

A number of univariate and multivariate analyses were conducted to identify major predictors of 1998 current problem and pathological gambling outcomes.

#### **Univariate Prediction**

As indicated, a significant number of 1991 SOGS-R defined lifetime and current probable pathological and problem gamblers were found to have shifted to less or non-problematic gambling status at the time of their 1998 assessment. This was also the case with 1991 DSM III-R interviewer assessed 'pathological' gamblers when they were re-assessed in 1998 with the Fisher DSM-IV Screen. A smaller number of participants reported either the development of problems or the exacerbation of previously existing problems.

Apart from determining the degree of change in problem and probable pathological gambling status, this study was also designed to increase understanding about how such changes occur. This was explored in a variety of ways. In an earlier section, we analysed responses to questions about increases and decreases in various aspects of respondents' gambling behaviour and their views on why these changes took place. Relationships between problematic gambling and a variety of other measures included in the 1991 and 1998 data sets have also been examined cross sectionally. A number of variables were identified in both 1991 and 1998 that were associated with problem and probable pathological gambling in those years. In addition, analyses of co-variation of change in problem gambling status with change in other measures such as gambling participation and various mental health indices have just been outlined.

The next step of the analysis takes this exploration further by seeking to identify factors that are associated with and predictive of problem gambling status in 1998. **Because of the prospective design used in this study, it is possible to examine how well variables assessed in 1991 predict and explain subsequent outcome status.** This matter is also addressed later by analyses selected to assess the impact of the introduction of casinos on problem gambling prevalence and by considering information collected from respondents about help seeking and therapy.

The 1991 predictor variables examined in relation to 1998 problem gambling status are listed in Table 14. Most of these variables were selected on the basis of their hypothesised relevance to the prediction of future problem gambling status. Many of them have already been shown in analyses summarised in this report to be associated with problem gambling.

The 1998 current SOGS-R measure was regarded as the most appropriate outcome measure for these analyses. Consideration was given to using the raw (continuous) SOGS-R score in addition to the conventional three-way division between probable pathological gambler, problem gambler and no problem groups. However, this was abandoned because the SOGS-R score distribution was markedly non-normal. The three way categorisation was also abandoned in favour of a two-way split (dichotomisation) between current probable pathological gamblers combined with problem gamblers (SOGS-R score of 3 or more) versus non problem gamblers (SOGS-R score of 0, 1 or 2). This provided a larger group of currently problematic gamblers than would have been the case if attention was confined to the probable pathological gambler group alone (19 people rather than 9). It also enabled the use of logistic regression, which does not require such restrictive assumptions as traditional parametric tests. In addition, the results can be presented as odds ratios. This assists in the description and interpretation of the findings. The decision to group the two problem gambling categories together was justified on the basis of a discriminant function analysis that failed to separate these groups yet found that both were significantly different to non-problem gamblers (Abbott & Volberg, 1991; Volberg & Abbott, 1994).

Of the predictor variables listed in Table 14, gender was the only sociodemographic predictor that was found to be significant at or beyond the .01 level. **Males were nine times more likely than females to be current probable pathological or problem gamblers at follow-up.**

All of the 1991 SOGS-R measures outlined in Table 14 were highly significant predictors of 1998 current SOGS-R two-way categorisation. **People initially classified as current problem or probable pathological gamblers in 1991 were 7.5 times more likely to be so classified seven years later than frequent continuous or non-continuous gamblers.**

Although 1991 interviewer assessed 'pathological gambling' was not a significant predictor when considered as a dichotomous variable (i.e. pathological or non-pathological), it was highly significant when examined as a continuous measure (i.e. treated as a scale).

**The various measures of alcohol misuse/problems (AUDIT) were also strong predictors with 1991 AUDIT cases seven times more likely than non-cases to be current current probable pathological or problem gamblers in 1998.** It was comparable in this regard to 1991 current SOGS-R 'caseness'. This is an important finding that has potential implications for prevention and treatment policy and practice.

**Table 14: Baseline Variables Assessed for Associations with 1998 Current SOGS Outcome<sup>1</sup>**

| Variables (1991) Assessed         |   |
|-----------------------------------|---|
| Gender                            | Amount per month                            |
| Age                               | Lotto                                       |
| Ethnicity                         | Instant Kiwi                                |
| Marital status                    | Other lotteries, raffles                    |
| Income (total household)          | Housie                                      |
| Ever had a problem with gambling? | Horses/Dogs                                 |
| Current SOGS-R Classification     | Gaming machines                             |
| Current SOGS-R dichotomised       | All activities                              |
| Current SOGS-R score              | Preferred type of gambling                  |
| Lifetime SOGS-R Classification    | Frequently take part in                     |
| Lifetime SOGS-R dichotomised      | Lotto                                       |
| Lifetime SOGS-R score             | Instant Kiwi                                |
| AUDIT Caseness (=8)               | Other lotteries, raffles                    |
| AUDIT Caseness (=10)              | Housie                                      |
| AUDIT score                       | Horses/Dogs                                 |
| Interviewer Classification        | Gaming machines                             |
| Interviewer score                 | Current SOGS-R/AUDIT Caseness (=8) Groups   |
| GHQ Caseness                      | Prob Path + Alcohol prob (N=10)             |
| GHQ score (/12)                   | Prob Path+ Alcohol no prob (N=2)            |
| Self-rated health                 | Non Prob. Path + Alcoh. Prob (N=47)         |
|                                   | Non Prob. Path + Alcohol. No problem (N=79) |

<sup>1</sup>SOGS-R outcome was split two ways into current probable pathological and problem gamblers versus non problem gamblers. The number of probable pathological gamblers (Current SOGS) at follow-up was too small (N=9) to enable analyses based on a probable pathological vs non probable pathological dichotomy

None of the measures derived from the GHQ-12 nor self-rated health were significant predictors.

Amount spent per month in 1991 on Lotto, housie, and all gaming activities combined were significant predictors; amount spent on the other forms listed in Table 14 were not.

A preference for track betting in 1991 was a strong predictor relative to preferences for Lotto or other forms of gambling.

**Of the various forms of gambling considered, only frequent 1991 participation in track betting and gaming machines (non-casino) were significant predictors.**

Hybrid predictor variables, formed by cross-tabulating AUDIT and SOGS-R, were also examined to see whether having both gambling and alcohol problems together led to a worse problem gambling outcome than just having one or the other. While suggestive that this combination is a very high risk factor, there were too few participants in the problem gambling/non-alcohol problem cell to provide a reliable analysis.

## Multivariate Prediction

As was evident from earlier analyses, many of the predictor variables just considered in relation to 1998 current SOGS-R status are inter-related, in some cases strongly so. This complicates interpretation of the relationships between individual predictors and the outcome measure. Multivariate analysis enables the relative predictive and explanatory capacity of the various predictor variables to be examined.

In the present instance, stepwise multiple logistic regression procedures were employed with p to enter set at 0.15 and, p to remove set at 0.20. As with the univariate analyses, the outcome measure was current SOGS-R dichotomised into probable pathological and problem gamblers versus non problem gamblers.

A number of analyses were conducted. Table 15 provides the summary table for an analysis run on all participants who did not have some missing data. Predictor variables listed in Table

14 with p values of 0.20 or less were entered into the analysis. From inspection of Table 15 it is evident that when the effects of other predictor variables are controlled, the most significant statistically and stable predictor is 1991 current SOGS-R performance entered as a continuous variable. Preference for track betting in 1991, non-European ethnicity and excessive or problematic alcohol consumption also emerge as significant and relatively strong predictors of probable pathological or problem gambling status seven years later. Males also appear to be at greater risk, although, in contrast to the univariate analysis, gender is no longer statistically significant. The lower odds ratio for males in the multivariate analysis is a consequence of the inclusion of stronger predictor variables in the model that were also associated with male gender, e.g. a preference for horse and dog race betting. It should be cautioned that the confidence intervals pertaining to most of the odds ratios reported here are quite wide.

**Table 15: Multivariate Logistic Regression Analysis of Baseline Variables Predictive of Probable Pathological or Problem Gambler Status (Current SOGS) at 1998 Follow-up: All Subjects (N = 138)**

| Variable                | Probable Pathological and Problem Gambler |        |       |
|-------------------------|---|--------|-------|
|                         | Odds Ratio                                | 95% CI |       |
| Final Step <sup>1</sup> |   |        |       |
| Gender                  |   |        |       |
| Female                  | 1.00                                      |        |       |
| Male                    | 3.79                                      | .60    | 23.76 |
| Ethnicity               |   |        |       |
| European                | 1.00                                      |        |       |
| Non European            | 4.67*                                     | 1.04   | 20.98 |
| Preferred Gambling      |   |        |       |
| Other / none            | 1.00                                      |        |       |
| Lotto                   | 1.97                                      | .34    | 11.41 |
| Horses / Dogs           | 7.48*                                     | 1.42   | 39.48 |
| Current SOGS Score      | 1.74**                                    | 1.25   | 2.42  |
| AUDIT                   |   |        |       |
| <10                     | 1.00                                      |        |       |
| ≥ 10                    | 3.82*                                     | 1.00   | 14.52 |

\*P<.05

\*\*P<.01

<sup>1</sup> -2 Log likelihood = 64.49, Model Chi-Square = 46.10, df = 6, P<.001

Table 16 provides a summary table for an analysis that was confined to the subset of participants who, based on their 1991 lifetime SOGS-R scores, were classified as probable pathological or problem gamblers. There were 77 such persons who were re-interviewed in 1998, 18 of whom were current probable pathological or problem 'cases' at follow-up. The previous analysis was concerned with identifying the fundamentally most important set of predictors for a mixed group of lifetime problem and pathological gamblers and people who gambled weekly or more with no or minor problems. The present analysis is confined to doing likewise for people who indicated by way of their SOGS-R performance that they had at some stage in their life had a gambling problem.

**Table 16. Multivariate Logistic Regression Analysis of Baseline Variables Predictive of Probable Pathological or Problem Gambler Status (Current SOGS) at 1998 Follow-up: Probable Pathological and Problem Gambler Subjects (N = 75).**

| Variable                | Probable Pathological and Problem Gambler |        |       |
|-------------------------|---|--------|-------|
|                         | Odds Ratio                                | 95% CI |       |
| Final Step <sup>1</sup> |   |        |       |
| Preferred Gambling      |   |        |       |
| Other / none            | 1.00                                      |        |       |
| Lotto                   | 2.64                                      | .44    | 15.65 |
| Horses / Dogs           | 8.67**                                    | 1.71   | 43.89 |
| Current SOGS Score      | 1.54*                                     | 1.08   | 2.19  |
| AUDIT                   |   |        |       |
| <10                     | 1.00                                      |        |       |
| ≥ 10                    | 4.11*                                     | 1.10   | 15.40 |

\*P<.05

\*\*P<.01

<sup>1</sup> -2 Log likelihood = 60.84, Model Chi-Square = 21.82, df = 4, P<.001

Apart from the sociodemographic variables that were no longer present, the findings of the analysis summarised in Table 16 are very similar to those of the previous analysis. This underlines their importance as prognostic indicators or predictors of future gambling problems. **It is of particular interest that the presence of gambling and alcohol problems were both independent predictors of future problem/probable pathological gambling. In the present sample, a preference for horse and dog racing in 1991 was clearly a further important risk factor.** It should be remembered that participants were recruited to this study in 1991 and that the youngest at the time of the 1998 follow-up were aged 25 years. Aging of participants was associated with a marked reduction in gaming machine participation, especially in the case of 1991 probable pathological and problem gamblers (refer to Tables 7 and 8).

Further analyses were run including the variables outlined above but with various problem gambling predictor variables removed. These analyses were undertaken to see whether or not, in this situation, other predictor variables would enter into the final model. It was found that the removal of the problem gambling predictors did not result in any alteration in the variables selected for the models, nor did it markedly alter their p values. It simply resulted in less predictive models.

## An Evaluation of the Introduction of Casinos

As indicated earlier, all of the lifetime problem gamblers and frequent non-problem gamblers selected for inclusion in phase two of the 1991 survey resided in or within close proximity to the three major metropolitan centres of Auckland, Christchurch and Wellington/Hutt. Most of the lifetime probable pathological gamblers also lived in these three centres although, in contrast to people in the other three groups, they were selected from all parts of the country.

Subsequent to the 1991 survey, casinos were introduced to Christchurch (in 1994) and Auckland (in 1996). The re-assessment of re-contacted 1991 phase two respondents in 1998 thus provided an opportunity to assess whether or not the introduction of casinos influenced their subsequent gambling and problem gambling behaviour. For the purpose of this evaluation, three groups were examined, namely respondents who resided in Auckland in both 1991 and 1998, respondents who resided in Christchurch in both 1991 and 1998 and the remaining respondents who, in 1998, lived somewhere other than Auckland or Christchurch.

The baseline characteristics of participants in each of the three locations are outlined in Table 17. Significant differences between groups in 1991 are evident on lifetime SOGS-R, ethnicity and frequent betting on other lotteries and raffles.

As with the outcome analyses reported in some of the previous sections, the current SOGS-R classification was dichotomised into probable pathological or problem gamblers versus non-problem gamblers, and this variable was used as the primary outcome measure. The major object was thus to see whether the introduction of casinos was associated with an increase in current problematic gambling in Auckland and Christchurch participants relative to those living in those parts of the country without easy access to casinos.

The analysis proceeded by cross-tabulating the primary outcome group by location and undertaking two logistic regression analyses. The first analysis was conducted on the unadjusted data. The three groups were not equivalent from the outset (baseline) with respect to problem gambling representation, in large part because of the way the probable pathological gambling group was selected relative to the other three groups. Consequently, a second analysis was undertaken using adjusted data. This analysis entered, as co-variables, baseline values of the outcome variable (current SOGS-R raw score), other variables exhibiting marked imbalances at baseline and those having prognostic value. Predictor co-variables included were: current SOGS-R score, lifetime SOGS-R score, DSM-III-R interviewer rating, ethnicity, gender, preferred gambling form, frequently bet on horses/dogs, frequently bet on gaming machines, frequently bet on lotteries or raffles of any kind, AUDIT score and GHQ-12 score. The inclusion of these co-variables provided a possible statistical method of controlling for initial differences between the three groups as well as for additional variables, other than the availability of casinos, that could have an influence on problem gambling outcome in 1998.

In addition to the logistic regression analyses employing the dichotomised current SOGS-R classification as an outcome, analyses were also undertaken using the raw current SOGS-R score as the outcome measure, despite its non-normal distribution. ANOVA and ANCOVA analyses were used for the unadjusted and adjusted current SOGS-R continuous outcome measure.

Finally, outcomes other than SOGS-R measures were assessed to determine any differences between the three groups with regard to patterns of gambling, namely activities preferred or frequently undertaken and the amount of money spent per month on the various gaming activities. For the adjusted analyses of these variables, a more restricted set of co-variables was employed than was the case for the SOGS-R outcome measures. Specifically, the set included the baseline value of the outcome variable, the baseline current SOGS-R score and variables showing a marked imbalance between the groups at baseline.

A summary of the results of this series of unadjusted and adjusted fixed model logistic regression analyses is provided in Table 18.

**From the analyses summarised in Table 18, it can be concluded that the introduction of casinos was not associated with significant changes in gambling behaviour or current probable pathological/problem gambling within the groups of study participants resident in Auckland and Christchurch relative to those living in other parts of the country.**

**Table 17: 1991 Baseline Characteristics of Participants by Location**



| Characteristic                        | Location                        |                                     |                              | P Value |
|---------------------------------------|---------------------------------|-------------------------------------|------------------------------|---------|
|                                       | Auckland<br>(N=53) <sup>1</sup> | Christchurch<br>(N=26) <sup>1</sup> | Other<br>(N=58) <sup>1</sup> |         |
| Male (%)                              | 45                              | 54                                  | 57                           | .461    |
| Age                                   |                                 |                                     |                              | .874    |
| 18-29 (%)                             | 26                              | 31                                  | 29                           |         |
| 30-49 (%)                             | 55                              | 42                                  | 50                           |         |
| 50+ (%)                               | 19                              | 27                                  | 21                           |         |
| European (%)                          | 74                              | 96                                  | 83                           | .049    |
| Married / de facto (%)                | 60                              | 73                                  | 64                           | .540    |
| Household Income                      |                                 |                                     |                              | .180    |
| < \$25,000 (%)                        | 21                              | 36                                  | 30                           |         |
| \$25,000-\$50,000 (%)                 | 40                              | 48                                  | 48                           |         |
| > \$50,000 (%)                        | 39                              | 16                                  | 21                           |         |
| Life-time SOGS-R Type                 |                                 |                                     |                              | .053    |
| Probable Pathological (%)             | 19                              | 19                                  | 38                           |         |
| Problem (%)                           | 25                              | 15                                  | 31                           |         |
| Continuous (%)                        | 30                              | 31                                  | 16                           |         |
| Non Continuous (%)                    | 26                              | 35                                  | 16                           |         |
| Life-time SOGS-R Score <sup>2</sup>   | 2.2 (±2.4)                      | 2.2 (±3.4)                          | 3.7 (±2.9)                   | .012    |
| Current SOGS-R Type                   |                                 |                                     |                              | .682    |
| Probable Pathological (%)             | 9                               | 8                                   | 10                           |         |
| Problem (%)                           | 15                              | 15                                  | 14                           |         |
| Continuous (%)                        | 34                              | 31                                  | 33                           |         |
| Non Continuous (%)                    | 34                              | 42                                  | 26                           |         |
| Irregular/Non gambler (%)             | 8                               | 4                                   | 17                           |         |
| Current SOGS-R Score <sup>2</sup>     | 1.3 (±1.7)                      | 1.3 (±1.9)                          | 1.7 (±2.1)                   | .828    |
| Pathological Gambler (DSM) (%)        | 4                               | 12                                  | 7                            | .421    |
| Have had a gambling problem (%)       | 9                               | 8                                   | 17                           | .331    |
| Preferred gambling                    |                                 |                                     |                              | .835    |
| Lotto (%)                             | 53                              | 46                                  | 48                           |         |
| Horses/Dogs (%)                       | 13                              | 15                                  | 21                           |         |
| Other/None (%)                        | 34                              | 38                                  | 31                           |         |
| Frequently bet                        |                                 |                                     |                              |         |
| Lotto (%)                             | 93                              | 81                                  | 88                           | .313    |
| Instant Kiwi (%)                      | 57                              | 62                                  | 59                           | .915    |
| Other Lotteries, raffles (%)          | 49                              | 62                                  | 28                           | .006    |
| Housie (%)                            | 8                               | 8                                   | 10                           | .853    |
| Horses/Dogs (%)                       | 32                              | 23                                  | 31                           | .693    |
| Gaming machines (%)                   | 19                              | 31                                  | 28                           | .420    |
| \$ spent per month                    |                                 |                                     |                              |         |
| Lotto <sup>3</sup>                    | 20.0 (50)                       | 20.0 (26)                           | 20.0 (52)                    | .441    |
| Instant Kiwi <sup>3</sup>             | 5.0 (40)                        | 5.0 (22)                            | 5.0 (39)                     | .662    |
| Other lotteries, raffles <sup>3</sup> | 3.5 (42)                        | 5.0 (20)                            | 5.0 (38)                     | .097    |
| Horses/Dogs <sup>3</sup>              | 20.0 (14)                       | 20.0 (7)                            | 10.0 (17)                    | .968    |
| Gaming machines <sup>3</sup>          | 10.0 (16)                       | 15.0 (8)                            | 10.0 (15)                    | .477    |
| All activities                        | 40                              | 41                                  | 41                           | .999    |
| AUDIT Case = 10 (%)                   | 24                              | 27                                  | 36                           | .333    |
| GHQ Case (%)                          | 19                              | 23                                  | 24                           | .788    |
| GHQ Score <sup>2</sup>                | 1.5 (±2.9)                      | 1.2 (±2.1)                          | 1.9 (±3.0)                   | .351    |

<sup>1</sup>Numbers in the groups for Household Income and AUDIT caseness were slightly lower due to missing values.

<sup>2</sup>Values are mean (SD)

<sup>3</sup>Values are medians (N). Sample sizes for these variables are smaller as the data relate only to respondents who had spent money on the activity in the past 6 months.

**Table 18: 1998 Follow-up Characteristics of Participants by Location**

| Characteristic  | Location           |                        |                 | P value<br>Unadjusted <sup>1</sup> | P value<br>Adjusted <sup>2</sup> |
|---|--------------------|------------------------|-----------------|------------------------------------|----------------------------------|
|   | Auckland<br>(N=53) | Christchurch<br>(N=26) | Other<br>(N=58) |                                    |                                  |
| Current SOGS-R  |                    |                        |                 |                                    |                                  |
| Score <sup>3</sup>                                      | .8 (±1.3)          | 1.2 (±3.1)             | 1.1 (±1.7)      | .433                               | .533                             |
| Probable Path / Problem (%)                             | 11                 | 8                      | 17              | .422                               | .475                             |
| Preferred gambling                                      |                    |                        |                 |                                    |                                  |
| Lotto (%)   | 62                 | 42                     | 64              | .151                               | .160                             |
| Instant Kiwi (%)  | 0                  | 12                     | 0               | -                                  | -                                |
| Other lotteries, raffles (%)                            | 2                  | 8                      | 0               | -                                  | -                                |
| Horses/Dogs (%)   | 15                 | 12                     | 17              | .797                               | .462                             |
| Gaming machines (%)                                     | 2                  | 4                      | 3               | .846                               | .798                             |
| Casinos (%)   | 8                  | 12                     | 2               | .165                               | .401                             |
| Frequently gamble                                       |                    |                        |                 |                                    |                                  |
| Lotto (%)   | 85                 | 89                     | 91              | .570                               | .375                             |
| Instant Kiwi (%)  | 26                 | 35                     | 33              | .684                               | .769                             |
| Other lotteries, raffles (%)                            | 21                 | 35                     | 22              | .370                               | .568                             |
| Horses/Dogs (%)   | 19                 | 19                     | 28              | .493                               | .665                             |
| Gaming machines (%)                                     | 4                  | 12                     | 9               | .404                               | .637                             |
| Casinos (%)   | 15                 | 12                     | 3               | .104                               | .314                             |
| Amount spent per month                                  |                    |                        |                 |                                    |                                  |
| > \$20 / mth Lotto (%) <sup>4</sup>                     | 45                 | 23                     | 37              | .200                               | .171                             |
| > \$5 / mth Instant Kiwi (%) <sup>4</sup>               | 27                 | 39                     | 56              | .673                               | .436                             |
| > \$5 / mth Other lotteries<br>raffles (%) <sup>4</sup> | 42                 | 47                     | 33              | .530                               | .067                             |
| > \$15 / mth Horses/Dogs (%) <sup>4</sup>               | 47                 | 38                     | 57              | .610                               | .737                             |
| > \$10 / mth Gaming machines (%) <sup>4</sup>           | 44                 | 25                     | 29              | .649                               | .965                             |
| > \$44.50 / mth All activities (%)                      | 54                 | 42                     | 47              | .582                               | .610                             |

<sup>1</sup> Differences between groups were assessed by the Kruskal Wallis test for SOGS score and Chi-square tests for all categorical variables. Confidence intervals and significance levels are conditional on the design effect being ignorable, i.e. as for a simple random sample rather than for a complex design.

<sup>2</sup> Differences between groups were assessed by adjusting for baseline values of the dependent variable, baseline values of prognostic variables and variables exhibiting imbalance between the groups at baseline. Adjusted analyses were by ANCOVA for the SOGS score and logistic regression for all other variables.

<sup>3</sup>Values are mean (SD)

<sup>4</sup>Sample sizes for these variables were smaller as the data relate only to respondents who had spent money on the activity in the past 6 months at both baseline and follow-up. Numbers in the Auckland, Christchurch and Other groups respectively were: Lotto: 49, 22, 52; Instant Kiwi: 33, 13, 35; Other lotteries, raffles: 38, 19, 42; Horses/Dogs: 18, 8, 21; Gaming machines 9, 18, 17.

## 4. DISCUSSION

As mentioned at the outset, this study was designed to further understanding of the nature of gambling and problem gambling in the community, especially with respect to their definition and measurement as well as their stability and change over time. The prospective design enabled these and related matters to be examined from a perspective that has hitherto been missing in the gambling studies field.

Attrition (loss of people from the original sample) is a feature of virtually all longitudinal research and has the potential to seriously compromise its validity. Considering the time period involved in the present study and the nature of the participant sample, the percentage that was contacted and reassessed can be considered acceptable. The participants re-interviewed did differ somewhat from the original group, especially with regard to ethnicity. Furthermore, there were some indications that there may have been higher attrition among people who had experienced more serious gambling-related problems in 1991. There were, however, clearer indications of this form of attrition between phases one and two of the 1991 survey. These matters must be kept in mind when considering the findings of the study and their wider implications.

An important finding was that the most widely used measure of problem gambling, the lifetime version of the SOGS, was not stable over time. This questionnaire asks people if they have ever behaved in particular ways or had various experiences. Consequently, in the case of SOGS-defined probable pathological gamblers, consistency in performance over time is expected, irrespective of what is happening currently in the respondent's life with respect to gambling-related problems. Put another way, if a person has indicated that they once met the criteria for probable pathological gambling, it is assumed that on subsequent occasions they will continue to recall and report this when asked the same questions. People with lower (non-pathological) scores on the original SOGS, or lifetime component of the SOGS-R, in contrast, may change over time. Those in the problem score range may become probable pathological gamblers. Those in the non-problem range can become either problem or probable pathological gamblers.

The finding that only 28 percent of the 1991 SOGS-R defined lifetime probable pathological gamblers retained this status when re-assessed seven years later was unexpected. Although approximately two-thirds of probable pathological gambler respondents remained within the combined probable pathological/problem gambling range when reassessed in 1998, this degree of inconsistency is still unacceptable for a lifetime measure.

It is probably significant that reductions in SOGS-R lifetime and current scores between 1991 and 1998 were found to have a moderately strong tendency to occur together (their change scores had a correlation of 0.6). These changes were associated, albeit less strongly, with changes in overall gambling expenditure. Thus, it would appear that the so-called lifetime component of the SOGS-R (and, presumably the original version of the SOGS) are at least in part responsive to changes in current gambling and problem gambling behaviour. The current (past six months) component of the SOGS-R was more responsive to change, although the difference between the 'lifetime' and current measures in this respect was far less than anticipated.

A cautionary note needs to be raised here. In the 1991 study, the SOGS-R was presented during the phase one telephone interview. At the 1998 follow-up, it was presented face-to-face. It is possible that the mode of delivery may have influenced the outcome more than, or instead of, the passage of time and other factors. Perhaps people are more open to the disclosure of information concerning adverse effects of gambling on their lives when interviewed by telephone than when interviewed face-to-face? However, in the present instance, the respondents had been interviewed previously on the same topic, once by telephone and once face-to-face. In addition, similar results were obtained for a number of

the gambling 'costs and benefits' questions that also used lifetime and past six months formats. These questions were administered face-to-face in both 1991 and 1998. Nevertheless, to remove this possible confounding factor, future research should ensure that there is consistency in the mode of presentation. Some further light may be shed on this issue by additional analysis that is being considered for the 'costs or benefits' data set. It may be, from these analyses, that some aspects of 'lifetime' gambling and problem gambling behavior and experiences will be identified that are prone to memory and other distortions over time whereas others are more consistently reported.

A further possibility is that although presented as lifetime measures, a number of 1998 respondents may have believed that the lifetime SOGS-R and some other questions just related to "since the last time we interviewed you." This possibility should also be examined in future studies.

If the SOGS-R lifetime measure is as unstable as suggested by the present findings, it has potentially important implications. Consideration of this matter here is confined to three issues.

The first issue concerns lifetime problem gambling prevalence estimates. If large numbers of people who meet diagnostic thresholds on the SOGS and lifetime SOGS-R earlier in their lives subsequently fail to report that they ever experienced this degree of disorder, it appears highly likely that population prevalence surveys significantly under-report the true lifetime prevalence of pathological gambling. This may also be found to be the case for some other mental disorders including alcohol and drug problems.

A related issue concerns estimates of so-called 'spontaneous remission' or 'natural recovery' from gambling problems. When they first developed and administered the SOGS-R in New Zealand during 1991, Abbott and Volberg (1991) were of the view that the difference between the lifetime and current SOGS-R prevalence rates provided an indication of the number of people who had previously experienced serious gambling problems but had since overcome them. As there was very little treatment or mutual help group support available at the time of the 1991 study, the authors assumed that the difference was largely accounted for by 'natural recovery'. The findings of the present study, however, strongly suggest that the lifetime 'yardstick' moves over time, partly tracking individuals' reducing levels of problem gambling. If so, estimates of the numbers of improved, recovered, or 'in remission' problem and pathological gamblers based on a single cross-sectional prevalence survey will also greatly under-estimate the number of these people in the community.

The third issue relates to the persistent finding from problem gambling prevalence studies, in various parts of the world, that lifetime prevalence rates for youth and young adults greatly exceed those of older adults. Major differences of this type were evident in the 1991 national survey and were considered by the authors to very probably indicate a substantial increase in the prevalence of problem gambling in recent years (Abbott & Volberg, 1991; 1996a). In part, this conclusion was based on the assumption that the lifetime SOGS-R scores obtained by adults were an accurate reflection of their lifetime problem gambling status. If so, apart from an increase in youth prevalence, the only way to account for this finding was that large numbers of young pathological gamblers died prematurely. Although high levels of suicidal ideation and suicide attempts have been reported among pathological gamblers, it is most improbable that sufficient would kill themselves to explain the difference.

The findings of the present study strongly suggest that the measurement of adult lifetime problematic gambling does not accurately reflect levels of problem gambling earlier in participant's lives. Consequently, while problem gambling prevalence may be rising among young people, it is unlikely that this can be validly inferred from prevalence differences between age groups obtained from cross sectional population surveys. Longitudinal and replication surveys are required to obtain accurate information to address this important matter.

It would be helpful if future research could find out more about respondents who previously reported experiencing serious gambling problems but who, some years later, no longer report having had these problems in the past. It is probable that many no longer experience problems and that their current non-problem state in some way influences their thinking about, or recall of, earlier problems. It is also possible that some of these people may still have problems but deny them currently and/or in the past. They may also be prone to relapse at a later stage in their lives.

Another important aspect of the present study is what it adds to the understanding of the natural history of problem gambling. As mentioned in Section Two, the GA and official DSM view is that pathological gambling is a chronic, relapsing disorder. Lesieur's (1984) longitudinal perspective on gambling - the "chase" - also implies an irreversible downward spiral. While these conceptualisations are being challenged, there has been little relevant research to inform the emerging debate.

Prior to the present study, apart from some follow-up studies of pathological gamblers who had received treatment and a few anecdotal accounts of aspects of the lives of non-treated pathological gamblers living in the community, virtually nothing was available on this topic within the gambling studies literature. Very few treatment follow-ups extended beyond two years. Blaszczynski (1988) is an exception. He followed up 63 of 120 treated pathological gamblers between two and nine years after they had completed their treatment. Eighteen were abstinent, 24 were gambling in a controlled way and 21 were gambling in an uncontrolled way. He also found that the controlled and abstinent gambler groups both improved markedly relative to the uncontrolled group on a number of measures of anxiety, depression and other indicators of psychological disturbance.

Although there is relatively little research on the issue of treatment outcome and none, prior to the present study, on the longer term course of pathological gambling among non-clinical samples, somewhat more is known about this with respect to serious alcohol-related problems and some other forms of drug dependency. Vaillant (1995) undertook a review of long-term follow-up studies of alcoholics who had received variable degrees of treatment. He noted abstinence rates varying from eight to 44 percent, return to drinking with no or minimal symptoms ranging from zero to 33 percent and persisting alcoholism falling between 36 and 87 percent.

Apart from Vaillant's (1995) own work, there is considerably less longitudinal research on alcohol problems and dependence among people selected randomly from the community as opposed to being followed up after attending treatment programmes. He concluded:

Because we lack longitudinal studies of both treated and untreated alcoholics, the current student of alcoholism can go no further than to agree with Cahalan (1970), who pointed out that with passage of time some alcoholics will die, some will become abstinent, some will return to social drinking and some will be unchanged. The proportion of alcoholics following any single route is unknown (p.5).

In the present study, the reassessment of 1991 current probable pathological gamblers indicated that only about a quarter remained 'pathological' seven years later. However, nearly a third remained in the less serious 'problem gambling' category. It was noted that this degree of 'recovery' was similar to what was found for GHQ-12 defined mental disorder but substantially less than was the case for AUDIT defined alcohol problems. None of the 1991 probable pathological or DSM-III-R rated 'pathological' gamblers reported, in 1998, having received professional or mutual help group assistance for their gambling problems. Thus, on the face of it, it would appear that pathological gambling has a higher 'natural recovery' rate than is the case for alcohol problems. However, it should be cautioned that the sample in the present study was small and the confidence intervals associated with the improvement rates were high for all three forms of psychopathology considered. Consequently, this 'conclusion' should be regarded as a hypothesis that requires further study rather than a definitive statement.

It is also possible that people with more serious forms of pathological gambling, such as those who present for treatment, are less likely to become non-problematic over time. In the present study, there were strong indications that current problem gamblers (with SOGS-R scores of 3 or 4) were much more likely than probable pathological gamblers (with SOGS-R scores of 5 or more) to move into the non-problem score range over time. Current problem gamblers thus appear to be more 'in transition' than their probable pathological counterparts.

Although a large majority of 1991 current problem gamblers became non-problem gamblers, some (9%) remained problem gamblers and a significant minority (14%) appear to have progressed to pathological gambling status. This suggests that more than five times as many problem gamblers are, over a seven year period, in transition to non-problem rather than probable pathological status. Again, it must be cautioned that the confidence intervals associated with these estimates are wide and further investigation is warranted.

In the present study, among the 1991 lifetime probable pathological and problem gamblers, it was found that sociodemographic factors including age, gender and ethnicity were not associated with problem gambling outcome seven years later. The factors that were found to be significant in this regard were a preference for track betting, a higher 1991 current SOGS-R score and experiencing alcohol-related problems in 1991. These factors should be further examined in subsequent research on problem gambling, both in community and treatment populations. Indeed, the findings suggest that past alcohol problems are as important as past gambling problems in predicting future gambling problems. It may be that alcohol problems and some continuous forms of gambling such as track betting play an important role in relapse. If so, this has potentially important implications for the design of prevention and treatment programmes.

In the alcoholism field, there has been a long-standing debate about the degree to which alcohol dependent people can return to 'controlled' or non-problematic drinking. It seems that this is a more likely outcome for younger drinkers with less severe problems. In the present study, it was found that many 1991 current problem and probable pathological gamblers reported both a reduction in problem levels and ongoing frequent participation in either continuous or non-continuous forms of gambling. Further longitudinal research is required to see whether these patterns of non-problematic gambling can be sustained or whether they increase the risk of 'relapse.' As suggested, some forms of continuous gambling including track betting may be particularly significant in this regard.

As none of the respondents who moved from either of the problem gambling categories (problem and probable pathological gamblers) reported receiving professional or mutual help group assistance, how did they change?

In their 1991 study, Abbott and Volberg (1992; 1996a) found that problem and probable pathological gamblers frequently reported, retrospectively, that they reduced their gambling following changes to their life circumstances such as the arrival of children or a change in employment status. Similar reports emerged from the present study.

In this study, which in 1998 only included people aged 25 years and older, other reasons frequently given by probable pathological and problem gamblers for reductions in their gambling participation included a lack of money, increased awareness and "wisdom" arising from life experience, environmental and life circumstance changes and a lack of interest in gambling. Marriage breakups were mentioned by 13 percent of the probable pathological gamblers. These and other factors that may play a role in natural recovery or self-change clearly warrant more focussed investigation.

Since 1991, there is evidence of widening income inequalities in New Zealand, with reduced income for people in the lowest income groups and an increase in both relative and absolute poverty (National Health Committee, 1998). This decline in income has been exacerbated by reductions in benefit payments and is most evident among beneficiaries. Young people, Māori and Pacific Islanders are over-represented among both beneficiaries and low income

wage earners. In the 1991 national survey (Abbott & Volberg, 1991; 1996a) these groups had high rates of problem and pathological gambling.

In Section Two, in describing DIA survey findings, changes in gambling participation were noted between 1990 and 1995, with reduced gambling expenditure by some of these high-risk groups, particularly with respect to gaming machines. Given the large numbers of respondents in the present study who mentioned financial difficulties or a lack of money as a reason for their lower levels of gambling participation, it may be that this changed income distribution contributed to problem gambling reductions and to the quite marked change in gambling participation by people who previously engaged frequently in continuous forms of gambling. Particularly large reductions on the part of 1991 problem and probable pathological gamblers were evident for regular gaming machine participation. Problem gambling and high gambling expenditure could, of course, also contribute to financial difficulties. Similarly, higher income within other sectors of the population may have contributed to the gambling participation increases found for some participants since 1991.

Although household income was not found to be a significant predictor of problem gambling outcome in 1998, the measure included pertained to 1991, not 1998. It will be of interest to see whether changes in income distribution are reflected in gambling and problem gambling patterns in the 1999 national prevalence study.

Although longitudinal studies have the potential to assess the incidence (the development of new cases) of mental disorder, with relatively rare disorders such as pathological gambling, large samples are required to provide useful information. In the present instance, while there are indications that frequent continuous gamblers and people who have previously reported gambling or alcohol problems are more likely to develop problems, adequate examination of these matters was constrained by the small sample size.

The issue of sample size and a consequent reduction in statistical power is also relevant to the finding that the introduction of casinos did not appear to influence participant gambling patterns or problem gambling levels. The sample in question was not representative of the general population. It was comprised of people who had had problems in the past and people who gambled frequently but did not experience gambling problems. Because it involved people who had been interviewed seven years previously, it did not include teenagers and involved relatively few young adults. Many of the people included in the study appeared to be in the process of reducing their gambling involvement and some appeared to be 'maturing out' of past patterns of problematic gambling. Relatively few became regularly involved in casino gambling. While there was no evidence that the advent of casinos led to increased problems for the study sample as a whole, a different picture might have emerged if a larger sample drawn randomly from the general adult population had been surveyed.

The study also obtained information relevant to furthering understanding of the construct validity of a number of gambling and problem gambling measures. Given the desirability of developing measures based on the most recent version of the DSM-IV, it is important to ensure that the performance of these new measures is understood in relation to that of the SOGS and SOGS-R. As mentioned in Section Two, it will not be possible to link the findings of future research based on the new measures to the large international body of existing research that has been built largely around the original SOGS and its derivatives without such information.

In the present study, both the SOGS-R and Fisher DSM-IV Screen evidenced moderate positive correlation with expenditure on some continuous forms of gambling and overall gambling expenditure. Performance on these measures also correlated with AUDIT-assessed alcohol problems. They did not relate significantly to GHQ-defined mental disorder or to self-rated general health. On the other hand, as expected, the two problem gambling measures did show moderate to high correlation with each other, especially in the case of current SOGS-R and the Fisher Screen which is also a current measure. Technically, this pattern of findings provides evidence of both divergent and discriminant validity for the problem gambling measures. It also extends our knowledge of problem gambling

comorbidity. Further analysis will be undertaken on the data set to examine the reliability of these two measures and probably also to explore more fully their relationship with the gambling 'costs and benefits' questions.

In conclusion, while this study is limited by its small sample size, the complex way in which the sample was derived and attrition between assessments, it has provided new information on a number of central issues within the problem gambling field. While illustrating some of the difficulties inherent in conducting longitudinal research in real-life settings, it has also indicated the importance of adding a time dimension to gambling research and the investigation of problem gambling and other mental disorders.



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## APPENDICES

## **Appendix One: 1998 Follow-up Questionnaire**

NZ GAMING SURVEY - LONGITUDINAL FOLLOW-UPQUESTIONNAIRE

START TIME:

## INTRODUCTION:

"Thank you for agreeing to be re-interviewed, seven years after your previous interview in our national study of gambling in New Zealand. Your answers are completely confidential. We appreciate your participation in this research."

SECTION 1

- Q1 "People bet or spend money on many different things, such as raffles, Lotto, housie, sports events, card games, and others. I am going to read out a list of these activities. Can you first tell me, for each one, whether you have ever spent money on that activity?"  
(READ OUT LIST ON PAGE 2, 1ST COLUMN.)
- Q2 "I am going to run through the list again. Can you tell me which of the activities you have bet or spent money on during the past six months?"  
[READ OUT (a) TO (p) FOR THOSE CIRCLED 'YES' IN Q1 .]
- Q3 "Can you give me an idea of the amount of money that you spent on <activity> in a typical month? I am only looking for an approximate amount, rounded to the nearest \$5 or so."  
[READ OUT (a) TO (p) FOR THOSE CIRCLED 'YES' IN Q2 ]
- Q4 "And can you tell me which of these activities you usually take part in once a week or more often?"  
[READ OUT (a) TO (p) FOR THOSE CIRCLED 'YES' IN Q2 ]

INTERVIEWER: PLEASE TICK BOX IF RESPONDENT REQUESTS A COPY OF  
THE SUMMARY OF MAIN FINDINGS FROM THIS STUDY.

☐

|   | Q1<br>Ever bet<br>on this | Q2<br>In the past<br>6 months | Q3<br>Amount<br>per month | Q4<br>Once<br>a week |
|---|---------------------------|-------------------------------|---------------------------|----------------------|
| (a) "Lotto?"  | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (b) "Instant Kiwi?"   | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (c) "Daily Keno?"   | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (d) "Telebingo?"  | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (e) "Other lotteries or raffles<br>of any kind?"                                    | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (f) "0900 telephone competitions?"  | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (g) "Gambling on the Internet for money?"<br>IF YES, ASK (i) TO (v).                |                           |                               |                           |                      |
| (i) "Was that betting on horse<br>or dog races?"                                    | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (ii) "Other sports betting?"  | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (iii) "Lottery tickets?"  | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (iv) "Casino games, including all<br>gaming machines on the Internet?"              | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (v) "Any other types of gambling<br>activity?" (SPECIFY)<br>_____                   | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (h) "Gambling at a Casino?"<br>IF YES, ASK (i) & (ii).                              |                           |                               |                           |                      |
| (i) "Was that gaming machines?"   | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (ii) "or other games at a casino?"  | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (i) "Gaming machines that aren't in casinos?"                                       | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (j) "Betting on horse or dog races?"  | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (k) "Other sports betting?"   | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (l) "Dice games such as Crown & Anchor,<br>played for money?"                       | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (m) "Card games played for money?"  | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (n) "Housie played for money?"  | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (o) "Money bets with friends or workmates<br>on the outcome of some event?"         | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |
| (p) "Any other gambling activity, for example<br>battens up or mah-jong?" (SPECIFY) | Yes-1 +<br>No-2 CR-3      | Yes-1 +<br>No-2 CR-3          | \$ _____                  | Yes-1<br>No-2 CR-3   |



Q5 "The next set of questions is part of a standard measurement scale, which has previously been used in New Zealand, the USA and Australia in surveys similar to this one. There are no right or wrong answers to these questions. Please try to be as accurate as possible in your answers, and remember that this information is absolutely confidential."

INTERVIEWER: IF YOU ENCOUNTER DIFFICULTIES WITH RESPONDENTS IN COMPLETING THIS SECTION, SAY:  
"We realise that these questions may not apply to everyone, but to be consistent nationwide, we do need to ask them all."

|   |  |
|---|--|
| <p>Q6 "When you participate in the gambling activities we have discussed, how often do you go back another day to win back money you lost? Is it ...?"<br/>(READ OUT AND CODE SINGLE RESPONSE)</p> <p>"Never?" ..... 1      Û GO TO Q8<br/>         "Some of the time?" ..... 2<br/>         "Most of the time?" ..... 3<br/>         "Every time?" ..... 4</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">         DNRO: Don't know ..... 5      Û GO TO Q8<br/>               Refused ..... 6      Û GO TO Q8       </div> <p>Q7 "And how often have you done this in the last <u>6 months</u> ? Was it ...?"<br/>(READ OUT AND CODE SINGLE RESPONSE)</p> <p>"Never?" ..... 1<br/>         "Some of the time?" ..... 2<br/>         "Most of the time?" ..... 3<br/>         "Every time?" ..... 4</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">         DNRO: Don't know ..... 5<br/>               Refused ..... 6       </div> | <p>Q10 "Do you <u>ever</u> spend either more time or more money gambling than you intend?"<br/>(CODE ① IF 'YES' TO EITHER)</p> <p>Yes ..... 1<br/>         No ..... 2<br/>         Don't know ..... 3      Û GO TO Q12<br/>         Refused ..... 4</p> <p>Q11 "And have you done so in the last <u>6 months</u>?"<br/>(SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>         No ..... 2<br/>         Don't know ..... 3<br/>         Refused ..... 4</p>     |
| <p>Q8 "Have you <u>ever</u> claimed to be winning money from these activities when in fact you lost? Is it ...?"<br/>(READ OUT AND CODE SINGLE RESPONSE)</p> <p>"Never?" ..... 1      Û GO TO Q10<br/>         "Some of the time?" ..... 2<br/>         "Most of the time?" ..... 3</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">         DNRO: Don't know ..... 4      Û GO TO Q10<br/>               Refused ..... 5      Û GO TO Q10       </div> <p>Q9 "And how often have you done this in the last <u>6 months</u>? Is it ...?"<br/>(READ OUT AND CODE SINGLE RESPONSE)</p> <p>"Never?" ..... 1<br/>         "Some of the time?" ..... 2<br/>         "Most of the time?" ..... 3</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">         DNRO: Don't know ..... 4<br/>               Refused ..... 5       </div>  | <p>Q12 "Have people <u>ever</u> criticised your gambling?"<br/>(SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>         No ..... 2<br/>         Don't know ..... 3      Û GO TO Q14<br/>         Refused ..... 4</p> <p>Q13 "And have people criticised your gambling in the last <u>6 months</u> ?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>         No ..... 2<br/>         Don't know ..... 3<br/>         Refused ..... 4</p>                              |
|   | <p>Q14 "Have you <u>ever</u> felt guilty about the way you gamble, or about what happens when you gamble?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>         No ..... 2<br/>         Don't know ..... 3      Û GO TO Q16<br/>         Refused ..... 4</p> <p>Q15 "Have you felt this way in the last <u>6 months</u>?"<br/>(SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>         No ..... 2<br/>         Don't know ..... 3<br/>         Refused ..... 4</p> |

|  |   |
|--|---|
| <p>Q16 "Have you <u>ever</u> felt that you would like to stop gambling, but didn't think that you could?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p> <p>Ü GO TO Q18</p>  | <p>Q22 "Have you had any of those arguments about your gambling in the last <u>6 months</u>?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p>                                      |
| <p>Q17 "Have you felt this way in the last <u>6 months</u>?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p>  | <p>Q23 "Have you <u>ever</u> missed time from work, school or study, due to gambling?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p> <p>Ü GO TO Q25</p>                          |
| <p>Q18 "Have you <u>ever</u> hidden betting slips, lottery tickets, gambling money or other signs of gambling from your spouse or partner, children or other important people in your life?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p> <p>Ü GO TO Q20</p> | <p>Q24 "And have you missed time from work, school or study, due to gambling, in the last <u>6 months</u>?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p>                        |
| <p>Q19 "And have you done this in the last <u>6 months</u>?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p>  | <p>Q25 "Have you <u>ever</u> borrowed money from someone and not paid them back, as a result of your gambling?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p> <p>Ü GO TO Q27</p> |
| <p>Q20 "Have you <u>ever</u> argued with people you live with over how you handle money?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p> <p>Ü GO TO Q23</p>  | <p>Q26 "And have you done so in the last <u>6 months</u>?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p>   |
| <p>Q21 "Have these arguments <u>ever</u> centred on your gambling?" (SINGLE RESPONSE)</p> <p>Yes ..... 1<br/>No ..... 2<br/>Don't know..... 3<br/>Refused .....4</p> <p>Ü GO TO Q23</p>  |   |

Q27 "I am going to read out a list of ways in which some people get money for gambling.  
Can you tell me which of these, if any, you have ever used to get money for gambling or to pay gambling debts?"  
[READ OUT (a) TO (i) AND CODE SINGLE RESPONSE FOR EACH IN COLUMN 27.]

Q28 "And which of these sources of money have you used in the past 6 months for this purpose?"  
[READ OUT (a) TO (i) FOR THOSE WHICH HAVE BEEN CODED YES IN Q.27. CODE SINGLE RESPONSE FOR EACH  
ASKED IN Q.28 COLUMN.]

|  | Q27<br>Ever borrowed | Q28<br>In past 6 months |
|--|----------------------|-------------------------|
| (a) "Borrowed household money"   | Yes-1 +<br>No-2 CR-3 | Yes-1 No-2 CR-3         |
| (b) "Borrowed from your spouse or partner"   | Yes-1 +<br>No-2 CR-3 | Yes-1 No-2 CR-3         |
| (c) "Borrowed from other relatives or in-laws"   | Yes-1 +<br>No-2 CR-3 | Yes-1 No-2 CR-3         |
| (d) "Loans from banks, loan or other finance companies"  | Yes-1 +<br>No-2 CR-3 | Yes-1 No-2 CR-3         |
| (e) "Cash withdrawals on <u>credit</u> cards"<br>INTERVIEWER: DOES NOT INCLUDE EFTPOS AND OTHER<br>INSTANT CASH CARDS TO ACCESS BANK ACCOUNTS. | Yes-1 +<br>No-2 CR-3 | Yes-1 No-2 CR-3         |
| (f) "Loans from loan sharks"   | Yes-1 +<br>No-2 CR-3 | Yes-1 No-2 CR-3         |
| (g) "Cashed in shares, insurance policies or other securities"   | Yes-1 +<br>No-2 CR-3 | Yes-1 No-2 CR-3         |
| (h) "Sold personal or family property"   | Yes-1 +<br>No-2 CR-3 | Yes-1 No-2 CR-3         |
| (i) "Borrowed from your cheque account by writing cheques<br>that bounced"   | Yes-1 +<br>No-2 CR-3 | Yes-1 No-2 CR-3         |

Q29 "Do you feel that you have ever had a problem with gambling?"

Yes ..... 1  
No ..... 2  
Don't know..... 3  
Refused .....4

Ü GO TO Q31

Q30 "Do you feel that you have had a problem with gambling in the last six months?"

Yes ..... 1  
No ..... 2  
Don't know..... 3  
Refused .....4

## DSM-IV QUESTIONS

READ OUT: "My next few questions are related to how you felt about your gambling over the **last year**.

As before, there are no right or wrong answers to these questions." (**SHOW CARD A**)

"Again, this is a standard measurement scale and we realise that these questions may not apply to everyone, but we need answers to all of the questions."

| SINGLE RESPONSE FOR EACH → |  | Never | Once or twice | Some-times | Quite often | Don't know | Refused |
|----------------------------|--|-------|---------------|------------|-------------|------------|---------|
| Q.31                       | "In the <b>past year</b> , how often have you found yourself thinking about gambling, for example, reliving past gambling experiences, planning the next time you will play, or thinking of ways to get money to gamble, etc?" | 1     | 2             | 3          | 4           | 5          | 6       |
| Q.32                       | "In the <b>past year</b> , how often have you needed to gamble with more and more money to get the amount of excitement you are looking for?"  | 1     | 2             | 3          | 4           | 5          | 6       |
| Q.33                       | "And how often have you become restless or irritable when trying to cut down or stop gambling in the <b>past year</b> ?"   | 1     | 2             | 3          | 4           | 5          | 6       |
| Q.34                       | "How often, in the <b>past year</b> , have you gambled to escape from problems or when you were feeling depressed, anxious or bad about yourself?"   | 1     | 2             | 3          | 4           | 5          | 6       |
| Q.35                       | "In the <b>past year</b> , after losing money gambling, how often have you returned another day in order to get even?"   | 1     | 2             | 3          | 4           | 5          | 6       |
| Q.36                       | "In the <b>past year</b> , how often have you lied to your family or others to hide your gambling?"  | 1     | 2             | 3          | 4           | 5          | 6       |
| Q.37                       | "In the <b>past year</b> , how often have you made repeated unsuccessful attempts to control, cut back or stop gambling?"  | 1     | 2             | 3          | 4           | 5          | 6       |
| Q.38                       | "In the <b>past year</b> , how often have you been forced to go beyond what is strictly legal in order to finance gambling or to pay gambling debts?"  | 1     | 2             | 3          | 4           | 5          | 6       |
| Q.39                       | "In the <b>past year</b> , how often have you risked or lost a significant relationship, job, educational or career opportunity because of gambling?"  | 1     | 2             | 3          | 4           | 5          | 6       |
| Q.40                       | "In the <b>past year</b> , how often have you sought help from others to provide money to relieve a desperate financial situation caused by gambling?"   | 1     | 2             | 3          | 4           | 5          | 6       |

Q.41 "Can you recall seeing or hearing any advertisements for any sort of gambling or betting activities, or games in which there is a bit of luck or chance, on TV, radio, or in newspapers, magazines or the mail?"

Yes - 1



No - 2



GO TO Q.43

Q.42 "Can you tell me what gambling activities you have seen advertised?"  
(RECORD, PROBING: "Any others?")

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

Q.43 "Now I would like to ask you some further questions about the gambling activities that you take part in. Can you tell me what is your preferred type of gambling?" (CIRCLE SINGLE RESPONSE IN GRID OVERLEAF)

Q.44 "And what other types of gambling do you frequently take part in?" (**SHOW CARD B**)  
"You may like to use the list on this card as a guide?" (CIRCLE ALL MENTIONED IN GRID OVERLEAF)

**ASK Q.45-49 FOR EACH TYPE OF GAMBLING CIRCLED IN Q.43 OR Q.44.  
CIRCLE OR RECORD ANSWERS IN GRID OVERLEAF.**

Q.45 "Thinking about <NAME GAMBLING TYPE> how often from this card (**SHOW CARD C**) do you gamble on it?" (FOR EACH TYPE CODED IN Q.43/Q.44, CIRCLE SINGLE RESPONSE IN Q.45 COLUMN OF GRID OVERLEAF)

**INTERVIEWER NOTE: Q.46-49 REFER TO THE "TYPICAL" OR "MOST OFTEN"  
TYPE OF SESSION FOR EACH ACTIVITY. WORK ACROSS THE GRID**

Q.46 "And when you are gambling on this activity, how much time do you typically spend in one gambling session?"  
(RECORD TIME IN MINUTES)

Q.47 "How much money would you typically spend on this activity in one gambling session?"  
(RECORD AMOUNT)

Q.48 "Using this card (**SHOW CARD D**) can you tell me who you usually gamble with on this activity?" (RECORD IN Q.48 COLUMN - NOTE THERE MAY BE MORE THAN ONE USUAL PARTNER FOR SOME ACTIVITIES)

**REPEAT Q.45-48 FOR EVERY TYPE OF GAMBLING CIRCLED IN Q.43 OR Q.44.**





Q.49 "Can you tell me the main reason why you gamble?" (RECORD, PROBE FULLY)

Q.50 "And are there any other important reasons why you gamble?" (RECORD, PROBE FULLY)

Q.51 "Thinking back now to the times when we interviewed you in 1991, and your gambling participation at the time, can you remember what your preferred form of gambling was at that time?"  
(RECORD PREFERRED FORM OF GAMBLING)

Q.52 (SHOW CARD C) "Can you tell me approximately how frequently you took part in your most preferred form of gambling then?"

- Every day ----- 1
- Several times a week ----- 2
- Once a week ----- 3
- Once a fortnight ----- 4
- Once a month ----- 5
- Less often than once a month -- 6

Q.53 (SHOW CARD E) "Thinking about your **overall** gambling in 1991, and your **overall** gambling now, do you consider that your gambling involvement has ...?" (SINGLE RESPONSE)

- Increased a lot ----- 1 → 

GO TO Q.54
- Increased a little ----- 2 →
- Stayed much the same --- 3 → 

GO TO Q.55
- Decreased a little ----- 4 → 

GO TO Q.54
- Decreased a lot ----- 5 →
- Refused/Don't know ---- 6 → 

GO TO Q.55



Q.54 "What do you think led to your <increased/decreased> gambling involvement?" (RECORD FULLY, PROBE TO CLARIFY)

-----  
-----  
-----  
-----  
-----  
-----  
-----

Q.55 "Can you think of any other changes that you have made in your gambling activities since you were interviewed in 1991?"  
(PROBE TYPES, FREQUENCY, LENGTH OF TIME, MONEY SPENT, COMPANY)

Types: -----

Frequency: -----

-----

Length of time: -----

-----

Money spent: -----

-----

Company: -----

-----

No other changes = Z

Q.56 "Were any of these changes associated with some specific event(s) or stage(s) of your life?"  
(RECORD, PROBING RELATIONSHIP BETWEEN EVENTS AND CHANGES)

-----  
-----  
-----  
-----  
-----  
-----

Q.57 "Gambling is one of the most popular leisure activities in the world. Many people gamble for fun or to be sociable, though some people experience problems related to their gambling. I am going to read out some statements people have made about their gambling. Firstly, from this card (**SHOW CARD F**) please tell me how often each statement has ever applied to you." (READ OUT STATEMENTS IN BLOCKS A-F, CIRCLE SINGLE RESPONSE IN Q.57 COLUMN FOR EACH. IF CODING 3, 4 OR 5, IMMEDIATELY ASK Q.58, THEN GO DOWN TO NEXT STATEMENT.)

Q.58 "And how often, from the same showcard, has it applied to you in the past 6 months?"

| A: PERSONAL   | Q.57 Ever                                | Q.58 Past 6 months |
|---|--|--------------------|
| 1. "Gambling has been a hobby and an interest to me."         | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 2. "When I have finished gambling, I have felt guilty."       | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 3. "I daydreamed about getting a big win."                    | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 4. "When I felt depressed, I used to gamble to escape."       | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 5. "I have felt that my gambling was a problem."              | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 6. "After losing heavily at gambling, I have felt depressed." | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 7. "My gambling has given me pleasure and fun."               | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 8. "I went for help with my gambling."                        | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |

| B: INTERPERSONAL/FAMILY  | Q.57 Ever                                | Q.58 Past 6 months |
|--|--|--------------------|
| 1. "My gambling has given me something to talk about with family and friends."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 2. "I have gone gambling with my friends or family."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 3. "My family or friends have criticised my gambling."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 4. "My gambling has caused arguments about money with family or friends."  | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 5. "When I have lost at gambling, I have bragged about winning."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 6. "I have hidden betting slips, lottery tickets, gambling money, or other signs of my gambling from family or friends." | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 7. "My gambling caused problems for my family or friends."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 8. "My gambling has felt more important to me than socialising with my family or friends."                               | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 9. "I have told lies about my gambling."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |
| 10. "My gambling caused the breakup of an important relationship."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |

| C: VOCATION/EMPLOYMENT   | Q.57 Ever                                | Q.58 Past 6 months |
|--|--|--------------------|
| 1. "Thinking about gambling has helped me get through a boring job." | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5          |

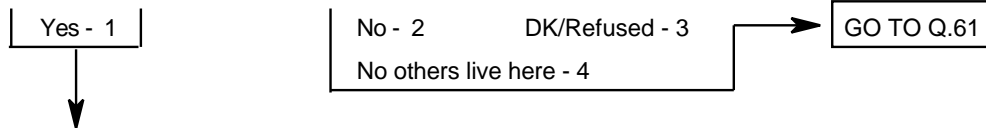
|   |   |
|---|---|
| 2. "I have lost time from work/study due to gambling."                        | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 |
| 3. "Thinking about my gambling has stopped me working efficiently at my job." | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 |
| 4. "I have moved/changed jobs because of problems over my gambling."          | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 |
| 5. "Gambling is something we all talk about at work."                         | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 |
| 6. "I have gone gambling with people from work."                              | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 |
| 7. "I have been sacked from my job because of my gambling."                   | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 |
| 8. "Being a person who gambles has helped me get on at work."                 | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 |

| <b>D: FINANCIAL</b>   | <b>Q.57 Ever</b>  | <b>Q.58 Past 6 months</b> |
|---|---|---------------------------|
| 1. "Winning at gambling has helped me financially."                     | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 | 1 2 3 4 5                 |
| 2. "Family or friends have had to pay my debts from gambling."          | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 | 1 2 3 4 5                 |
| 3. "I have borrowed money and not paid it back because of my gambling." | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 | 1 2 3 4 5                 |
| 4. "I have spent more than I could afford on my gambling."              | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 | 1 2 3 4 5                 |
| 5. "I won more than I have lost at gambling."                           | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 | 1 2 3 4 5                 |
| 6. "I have had a big win (\$1,000+) from gambling."                     | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 | 1 2 3 4 5                 |
| 7. "I have gambled to try and win money to pay off debts."              | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 | 1 2 3 4 5                 |
| 8. "I have borrowed money to gamble or to pay gambling debts."          | 1 2 <span style="border: 1px solid black; padding: 0 5px;">3 4 5</span> → 1 2 3 4 5 | 1 2 3 4 5                 |

| <b>E: LEGAL</b>  | <b>Q.57 Ever</b>                         | <b>Q.58 Past 6 months</b> |
|--|--|---------------------------|
| 1. "I have thought about doing something illegal to get money for gambling or gambling debts." | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 2. "I have borrowed money without permission or authority so I could gamble."                  | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 3. "My gambling has led to problems with the police."  | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 4. "I have appeared in court on charges related to my gambling."                               | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 5. "I have been in prison because of crimes related to my gambling."                           | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |

| <b>F: GAMBLING CHARACTERISTICS</b>   | <b>Q.57 Ever</b>                         | <b>Q.58 Past 6 months</b> |
|--|--|---------------------------|
| 1. "After losing at gambling I have gone back another day to win back my money."                           | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 2. "Each time I started gambling I expected to win."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 3. "My gambling has been skillful."  | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 4. "When I have gambled I have gone on for longer than I planned."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 5. "I have felt like stopping gambling but didn't think I could."  | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 6. "When I was gambling I felt excited."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 7. "When I was gambling I felt relaxed."   | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 8. "When I have had a disappointing or frustrating day I was more likely to go and gamble."                | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 9. "When I was losing, if I had urgent debts, I could go on gambling longer."                              | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 10. "I was more likely to go and gamble if I had had some good luck and I wanted to celebrate."            | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |
| 11. "When I had lost more money than I had planned, I was more likely to go on gambling if I was excited." | 1 2 <input type="text" value="3"/> 4 5 → | 1 2 3 4 5                 |

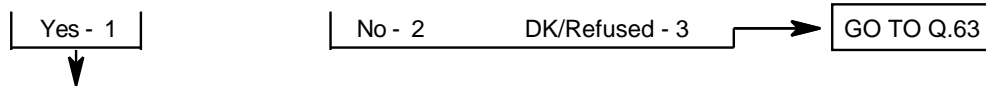
Q.59 "Thinking about the other people who live at **this address**, has any of them ever had a problem with gambling?"



Q.60 "And what is their relationship to you?" (RECORD E.G. WIFE, BROTHER, BOARDER ETC.)

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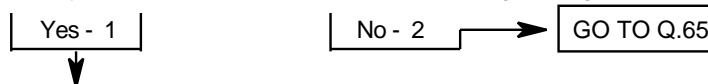
Q.61 "Is there anyone else in **your family** who has had a problem with gambling?"



Q.62 "And what is their relationship to you?" (RECORD EG, COUSIN, FATHER ETC.)

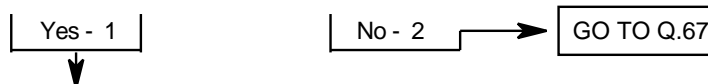
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Q.63 "Do you know **anyone else** who has had a problem with gambling?"



Q.64 "And what is their relationship to you?" (RECORD E.G. FRIEND, WORKMATE, BEST FRIEND, BEST FRIEND'S WIFE ETC.)

Q.65 "Have you ever sought help for a friend, family members, or someone else who you thought might have a gambling problem?"



Q.66 (SHOW CARD G) "Where did you seek help from for them?" (MULTIPLE RESPONSE)

|  |       |    |
|--|-------|----|
| Family                                   | ----- | 01 |
| Friends                                  | ----- | 02 |
| Workmates                                | ----- | 03 |
| Gambling Hotline                         | ----- | 04 |
| Gamblers Anonymous or GAMANON            | ----- | 05 |
| Psychologist, counsellor or psychiatrist | --    | 06 |
| General Practitioner (doctor)            | ----- | 07 |
| Nurse                                    | ----- | 08 |
| Minister/priest/pastor/monk              | ----- | 09 |
| Alcohol or drug treatment centre         | ----- | 10 |
| Other (SPECIFY)                          |       |    |
| <hr/>                                    |       |    |
| Don't know                               | ----- | 19 |
| Refused                                  | ----- | 20 |

[illegible]

ASK Q.67 ONLY IF RESPONDENT SAID 'YES' AT Q.29. OTHERWISE GO TO Q.78.

- Q.67 "Earlier you mentioned that you have had a problem with gambling. Can you tell me please how old you were when you first noticed that you had a problem with gambling?" (RECORD AGE)

years

Don't know = 98

Refused = 99

- Q.68 "Have there been times since then when you have been free or mostly free of gambling problems for six months or more?"

Yes - 1

No - 2

Don't know/Refused - 3

GO TO Q.78

- Q.69 "During the time or times when you were free or mostly free of problems, did you stop gambling altogether, reduce your gambling participation, or change your gambling in some other way?"  
(MULTIPLE RESPONSE)

Stopped altogether ----- 1

Reduced my gambling participation ----- 2

Changed my gambling in some other ways ---- 3

(SPECIFY IF CODED 3 ABOVE) \_\_\_\_\_

- Q.70 (IF MULTIPLE RESPONSE IN Q.69): "Which of these changes best describes your gambling during the time when you were free or mostly free of problems?" (SINGLE RESPONSE. RECORD USING Q.69 CODE NUMBER.)

- Q.71 "How many problem-free or largely problem-free periods of six months or more have you experienced?"

One only - 01

Two - 02

Three - 03

Four - 04

Five - 05

Six - 06

Other (SPECIFY) \_\_\_\_\_ Don't know/Can't recall - 19

- Q.72 (SHOW CARD H) "How did you overcome your gambling problems during these periods? Was it ...?"  
(MULTIPLE RESPONSE)

Through your own efforts ----- 01

Because you were in prison ----- 02

Because you were in hospital ----- 03

Through special help you received from:

Family ----- 04

Friends ----- 05

Workmates ----- 06

Gambling Hotline ----- 07

Gamblers Anonymous or GAMANON ----- 08

Psychologist, counsellor or psychiatrist -- 09

General Practitioner (doctor) ----- 10

Nurse ----- 11

Minister/priest/pastor/monk ----- 12

Alcohol or drug treatment centre ----- 13

Other (SPECIFY) \_\_\_\_\_

Don't know ----- 19

Refused ----- 20

- Q.73 (IF MULTIPLE RESPONSE IN Q.72, ASK): "Which of these was the main way in which you overcame or significantly reduced your gambling problems?" (SINGLE RESPONSE. RECORD USING Q.72 CODE NUMBER.)

- Q.74 "Have you ever returned to having problems with your gambling following a problem-free or largely problem-free period?"

Yes - 1

No - 2

Don't know/refused - 3

GO TO Q.76

- Q.75 "And what do you believe were the main reasons for this? Why did you return to having problems with your

gambling?" [IF NEED BE, PROMPT WITH: "And were there any other reasons?"]  
(RECORD FULLY)

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Q.76 "Have you sought or received any of these forms of help (**SHOW CARD G**) for gambling problems at any other time in your life?"

Yes - 1      No - 2      Don't know/refused - 3      **GO TO Q.78**

(CIRCLE ALL MENTIONED)

|  |       |    |
|--|-------|----|
| Family                                   | ----- | 01 |
| Friends                                  | ----- | 02 |
| Workmates                                | ----- | 03 |
| Gambling Hotline                         | ----- | 04 |
| Gamblers Anonymous or GAMANON            | ----- | 05 |
| Psychologist, counsellor or psychiatrist | --    | 06 |
| General Practitioner (doctor)            | ----- | 07 |
| Nurse                                    | ----- | 08 |
| Minister/priest/pastor/monk              | ----- | 09 |
| Alcohol or drug treatment centre         | ----- | 10 |
| Other (SPECIFY) _____                    |       |    |
| Don't know                               | ----- | 19 |
| Refused                                  | ----- | 20 |

IF UNCERTAIN , PLEASE MAKE  
A NOTE OF WHAT WAS SAID:

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Q.77 "How helpful was this/were these help to you in coping with your gambling problems?"  
(READ OUT AND CIRCLE SINGLE RESPONSE)

|                      |       |   |
|----------------------|-------|---|
| "Very helpful"       | ----- | 1 |
| "Somewhat helpful"   | ----  | 2 |
| "Somewhat unhelpful" | --    | 3 |
| "Very unhelpful"     | ----- | 4 |

**DO NOT READ OUT:**  
Don't know/Refused - 5

Q.78 (**SHOW CARD I**)

"Thinking about your life generally, during the **last 6 months**, how happy or satisfied are you?"

|                    |       |   |
|--------------------|-------|---|
| Very happy         | ----- | 1 |
| Somewhat happy     | ----- | 2 |
| Somewhat unhappy   | ----  | 3 |
| Very unhappy       | ----- | 4 |
| Don't know/Refused | ----  | 5 |

## MISCELLANEOUS

Q.79 "Now I'd like to ask you some general questions about yourself and your household.

What is your date of birth?"

|  |  |  |  |   |   |  |  |
|--|--|--|--|---|---|--|--|
|  |  |  |  | 1 | 9 |  |  |
|--|--|--|--|---|---|--|--|

Q.80 "What country were you born in?" (CIRCLE OR RECORD)

New Zealand

----- 01

GO TO Q.82

Other (SPECIFY) \_\_\_\_\_

Refused

----- 99

Q.81 "When did you first arrive in New Zealand?"

(IF DON'T KNOW MONTH/DATE, CODE DK.

IF CAN'T REMEMBER YEAR, ASK FOR BEST GUESS.)

|  |  |  |  |   |   |  |  |
|--|--|--|--|---|---|--|--|
|  |  |  |  | 1 | 9 |  |  |
|--|--|--|--|---|---|--|--|

Q.82 (SHOW CARD J)

"Can you tell me which of these ethnic groups you belong to?" (MULTIPLE RESPONSE)

New Zealander of European/Pakeha descent ----- 01

Other European ----- 02

New Zealander of Maori descent ----- 03

New Zealander of Pacific Island descent (SPECIFY)

----- 04

New Zealander of Asian descent (SPECIFY)

----- 05

Other ethnic group (SPECIFY) ----- 06

Refused

----- 99

Q.83 "Last week, did you do any work for pay or profit in a job, business or farm?"

Yes - 1

GO TO Q.86

No - 2

Q.84 "Last week, did you have a job, business or farm that you were away from because of sickness, holidays or any other reason?"

Yes - 1

GO TO Q.86

No - 2

Q.85 "Last week, did you work without pay in a family business or farm?"

Yes - 1

No - 2

GO TO Q.88

Q.86 "In your (main) job last week, what was your occupation?"

(RECORD SPECIFIC OCCUPATION AND INDUSTRY, E.G. SECONDARY TEACHER, EDUCATION)

-----

Q.87 "In your (main) job last week, what were your main tasks or duties?"

-----

-----

GO TO Q.92



Q.88 "At any time in the last four weeks, have you been looking for paid work?"

Yes - 1

→ **GO TO Q.90**

No - 2



Q.89 "Last week, was your main activity ...?" (READ OUT & CODE SINGLE RESPONSE)

"Studying?" ----- 1

"Retired?" ----- 2

"At home looking after children?" ---- 3

"At home, not looking after children?" -- 4

"Doing something else?" (SPECIFY) \_\_\_\_\_

→ **GO TO Q.92**

Q.90 **(SHOW CARD K)**

"In the last four weeks, have you done any of the following to find work?"  
(CODE ALL MENTIONED)

Looked at job advertisements in newspapers ----- 1

Wrote, phoned or applied in person to an employer ----- 2

Contacted NZ Employment Service ----- 3

Contacted friends or relatives about a job ----- 4

Contacted career advisers or vocational guidance officers ---- 5

Anything else (SPECIFY) \_\_\_\_\_

None of the above ----- 0

Q.91 "If a job had been available, could you have started last week?"

Yes - 1

No - 2

Q.92 "Have you obtained any school qualification?"

Yes - 1

No - 2

Q.93 "Have you obtained any qualifications since leaving school?"

Yes - 1

No - 2

→ **GO TO Q.95**



Q.94 **(SHOW CARD L)**

"What qualifications have you obtained since leaving school?" (MULTIPLE RESPONSE)

**Vocational or trade - 1**

(Includes: Trade Cert,  
Advanced Trade Cert,  
NZ Cert or Diploma,  
Technicians Cert,  
Polytech Cert or Diploma,  
Teachers Cert or Diploma,  
University Cert or Diploma below Bachelor level,  
Other qualification)

**Degree - 2**

(Includes: Bachelors Degree,  
Post Graduate Degree, Cert or Diploma)

Q.95 "Are you currently ...?" (READ OUT & CODE SINGLE RESPONSE)

- "Married?" ----- 1
- "Living with a partner?" -- 2
- "Separated?" ----- 3
- "Divorced?" ----- 4
- "Widowed?" ----- 5
- "Never married?" ----- 6

DO NOT READ OUT:  
Refused - 7

Q.96 (SHOW CARD M)

"What is your religion?"

- |                           |          |                          |          |
|---------------------------|----------|--------------------------|----------|
| Anglican                  | ----- 01 | Hindu                    | ----- 09 |
| Presbyterian              | ----- 02 | Muslim                   | ----- 10 |
| Catholic                  | ----- 03 | Buddhist                 | ----- 11 |
| Methodist                 | ----- 04 | Jewish                   | ----- 12 |
| Baptist                   | ----- 05 | Other religion (SPECIFY) |          |
| Latter Day Saints         | ----- 06 |                          |          |
| Pentecostal               | ----- 07 | No religion              | -- 97    |
| Other Christian (SPECIFY) | - 08     | Don't know               | -- 98    |
| ----- Refused             |          | ---                      | 99       |

Q.97 (SHOW CARD N)

"Which of these groups covers your **total household income from all sources?**  
This is before tax, and is for the 12 months ending today."

- \$20,000 or less ----- 1
- \$20,001 to \$30,000 ---- 2
- \$30,001 to \$40,000 ---- 3
- \$40,001 to \$50,000 ---- 4
- \$50,001 to \$70,000 ---- 5
- \$70,001 or more ----- 6
- Don't know ----- 7
- Refused ----- 8

Q.98 RECORD GENDER OF RESPONDENT:

Male - 1Female - 2

## **GHQ-12: GENERAL HEALTH**

"I would now like to ask you a series of questions about your general health. We are trying to establish whether there are any positive or negative general health effects associated with gambling activities.

I would like you to consider how your health has been in general, and if you have had any medical complaint over the past few weeks.

On this page are a series of questions relating to general matters of your health. Please answer all the questions by circling the answer which you think most closely applies to you. **Remember** that these questions are about present and recent complaints, not those you might have had in the past."

INTERVIEWER: HAND OVER PAGE LABELLED **GHQ-12**.  
ALLOW RESPONDENT TIME TO COMPLETE PAGE.  
CHECK FOR MISSED QUESTIONS.  
RECORD QUESTIONNAIRE NUMBER ON COMPLETED **GHQ-12**.

## **AUDIT**

"The next section has a set of questions about drinking activities and the use of drugs. Again, we are trying to establish whether there are any links between gambling and drinking and related activities. Please fill in the page as it applies to you."

INTERVIEWER: HAND OVER PAGE LABELLED **AUDIT**.  
ALLOW RESPONDENT TIME TO COMPLETE PAGE.  
CHECK FOR MISSED QUESTIONS.  
RECORD QUESTIONNAIRE NUMBER ON COMPLETED **AUDIT**.

"Thank you very much for agreeing to take part in this study. You have made a valuable contribution to the understanding of how people in New Zealand gamble and how gambling participation has changed in recent years. Do you have any comments that you would like to make about gambling generally or about this study?"

(RECORD) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Finish Time: \_\_\_\_\_

"May I please have your name and home phone number in case my supervisor wishes to verify this interview?"

Name: \_\_\_\_\_ Phone No. \_\_\_\_\_

Address: \_\_\_\_\_

INTERVIEWER: STAPLE THE APPROPRIATE 'GHQ-12' AND 'AUDIT' SHEETS  
TO BACK PAGE OF QUESTIONNAIRE.

CERTIFICATION: I hereby certify that this is a true and accurate record of an interview  
conducted by me at the time and place specified. TICK WHEN CHECKED:

☐

Interviewer Sign: \_\_\_\_\_ Date: \_\_\_\_\_

Location: \_\_\_\_\_ Total Duration: \_\_\_\_\_ minutes

Supervisor Sign: \_\_\_\_\_ Field Check: \_\_\_\_\_

1. Would you say your health is...?                      Good = 1                      Fair = 2                      Poor = 3

2. How often have you attended a doctor in the past 12 weeks?  
Not at all = 98                      Once = 01                      More than once (FILL IN: \_\_\_\_\_ times)

3. Are you taking any medications or tablets at the present time?  
None = 1                      Self medications (over the counter?) (e.g. aspirin) = 2  
Prescribed medicine = 3                      ➔ PLEASE NAME: \_\_\_\_\_

4. Been able to concentrate on whatever you're doing?

Better than usual = 1

Same as usual = 2

Less than usual = 3

Much less than usual = 4

5. Lost much sleep over worry?

Not at all = 1

Same as usual = 2

Rather more than usual = 3

Much more than usual = 4

6. Felt that you were playing a useful part in things?

More so than usual = 1

Same as usual = 2

Less useful than usual = 3

Much less useful = 4

7. Felt capable of making decisions about things?

More so than usual = 1

Same as usual = 2

Less so than usual = 3

Much less capable = 4

8. Felt constantly under strain?

Not at all = 1

Same as usual = 2

Rather more than usual = 3

Much more than usual = 4

...

9. Felt you couldn't overcome your difficulties?  
Not at all = 1

Same as usual = 2  
Rather more than usual = 3  
Much more than usual = 4

10. Been able to enjoy your normal day-to-day activities?

More so than usual = 1  
Same as usual = 2  
Less so than usual = 3  
Much less than usual = 4

11. Been able to face up to your problems?

More so than usual = 1  
Same as usual = 2  
Less able than usual = 3  
Much less able = 4

12. Been feeling unhappy and depressed?

Not at all = 1  
No more than usual = 2  
Rather more than usual = 3  
Much more than usual = 4

13. Been losing confidence in yourself?

Not at all = 1  
No more than usual = 2  
Rather more than usual = 3  
Much more than usual = 4

14. Been thinking of yourself as a worthless person?

Not at all = 1  
No more than usual = 2  
Rather more than usual = 3  
Much more than usual = 4

15. Been feeling reasonably happy, all things considered?

More so than usual = 1  
Same as usual = 2  
Less so than usual = 3  
Much less than usual = 4

**PLEASE HAND THIS PAGE BACK TO THE INTERVIEWER**

QUESTIONNAIRE NO. \_\_\_\_\_

**PLEASE CIRCLE THE ANSWER THAT IS CORRECT FOR YOU.**

1. How often do you have a drink containing alcohol, such as a beer, a glass of wine, or a tot of spirits?

4 or more times a week = 4  
2 - 3 times a week = 3

2 - 4 times a month = 2

Once a month, or less = 1

Never = 0

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

00 01 02 03 04 05 06 07 08 09 10 or more

| How often ..... (from this scale ) →   | Daily or<br>Almost<br>Daily | Weekly | Monthly | Less<br>than<br>Monthly | Never |
|--|-----------------------------|--------|---------|-------------------------|-------|
| 3. How often do you have 6 or more drinks on one occasion?   | 4                           | 3      | 2       | 1                       | 9     |
| 4. How often, during the last year, have you found it difficult to get the thought of alcohol out of your mind?                        | 4                           | 3      | 2       | 1                       | 9     |
| 5. How often, during the last year, have you found that you were not able to stop drinking once you had started?                       | 4                           | 3      | 2       | 1                       | 9     |
| 6. How often, during the last year, have you been unable to remember what happened the night before because you had been drinking?     | 4                           | 3      | 2       | 1                       | 9     |
| 7. How often, during the last year, have you needed a first drink in the morning to get yourself going after a heavy drinking session? | 4                           | 3      | 2       | 1                       | 9     |
| 8. How often, during the last year, have you had a feeling of guilt or remorse after drinking?   | 4                           | 3      | 2       | 1                       | 9     |

P.T.O.

9. Have you or someone else ever been injured as a result of your drinking?
- No = 9                      Yes, during the last year = 1  
                                    Yes, but not in the last year = 2
10. Has a relative/friend/doctor or other health worker ever been concerned about your drinking or ever suggested you cut down?
- No = 9                      Yes, during the last year = 1  
                                    Yes, but not in the last year = 2
11. Have either of your parents ever had a drinking problem?
- Yes = 1                      No/Not that I'm aware of = 2
12. Is there anyone who lives at this address who has ever had a drinking problem?
- Yes - 1                      No - 2                      No-one else living here - 3                      [Go to Question](#)
13. And what is their relationship to you? \_\_\_\_\_
14. Is there anyone else in your family who has ever had a drinking problem?
- Yes - 1                      No - 2                      Not that I'm aware of - 3                      [Go to Question](#)
15. And what is their relationship to you? \_\_\_\_\_
16. How often did you usually smoke cigarettes or use tobacco in some other way in the last 12 months?
- 20 or more times a day                      ----- 1  
At least once, but less than 20 times a day                      ---- 2  
A few times a week                      ----- 3  
Once a month or less                      ----- 4  
Never                      ----- 5
17. How often did you usually use marijuana in the last 12 months?
- 4 or more times a week                      ---- 1  
2-3 times a week                      ----- 2  
2-4 times a month                      ----- 3  
Once a month or less                      ----- 4  
Never                      ----- 5
18. How often did you usually use other drugs, including inhalants, barbiturates, amphetamines, cocaine, hallucinogens or narcotics, in the last 12 months?
- 4 or more times a week                      ---- 1  
2-3 times a week                      ----- 2  
2-4 times a month                      ----- 3  
Once a month or less                      ----- 4  
Never                      ----- 5

**PLEASE HAND THIS PAGE BACK TO THE INTERVIEWER**

## **Appendix Two: Costs and Benefits of Gambling**



This section provides a summary of participant responses to a series of questions that cover a number of positive and negative experiences and situations associated with gambling and problem gambling. The participants are the 143 1991 respondents who were re-interviewed in 1998. These questions were originally compiled by Professor Mark Dickerson and were included in the 1991 New Zealand national survey. Although grouped together under various headings and originally developed as a prototype for a multidimensional measure of positive and negative correlates of heavy, 'loss of control' gambling, the degree to which responses to questions within each group are related to one another has not been examined. Consequently, it is not known whether or not they constitute meaningful scales or measures of discrete underlying constructs. For this reason, each question should be considered in its own right.

Some of the questions are similar or identical to those included in the SOGS-R and Fisher DSM-IV Screen. They differ from the SOGS-R in that rather than being presented with a 'yes' - 'no' response option, respondents could select one of five options, namely 'never', 'rarely', 'sometimes', 'often' or 'always'. For presentation purposes, the three latter response categories have been combined. Thus, the findings reported below refer to the percentage of respondents who indicated that each situation or experience applied to them 'sometimes', 'often' or 'always'. Each question was asked in lifetime ("has this ever applied to you?") and current ("has this applied to you in the past six months?") format.

Responses to the questions are grouped for each of the following four 1991 categories of respondent - lifetime probable pathological gamblers, lifetime problem gamblers, frequent continuous gamblers and frequent non-continuous gamblers. Performance on the SOGS-R was used in the determination of membership to these categories. Given that some 'cost' and 'benefit' items are the same as or similar to a number of the SOGS-R questions, it was expected that there would be differences between the various groups on these particular items. In these instances, specific responses can be compared to provide a reliability check on SOGS-R questions. In the case of the other items, differences between the various groups add to our knowledge of what differentiates problem gamblers from frequent gamblers who do not report problems. These differences are also relevant to extending the construct validity of the SOGS-R as a measure of problem gambling. It is expected that the value of these sets of questions, in these respects, could be enhanced by more detailed statistical examination. However, the relatively small sample size and the way in which the sample was derived from the 1991 national survey may preclude the use of factor analysis and other forms of multivariate analysis. Specialist statistical advice is being sought on this issue. If appropriate statistical procedures are identified, a subsequent paper will be prepared that addresses this matter.

The information presented here also has some relevance to the question of change over time in both lifetime and current measures of gambling and problem gambling. Some consideration is given to this in the body of the present report.

**Table 1: Personal Pleasures and Costs of Gambling - Lifetime and Past Six Months**

| Classification                                     | <u>Probable Pathological</u> |      | <u>Problem</u> |      | <u>Continuous</u> |      | <u>Non-continuous</u> |      |
|--|------------------------------|------|----------------|------|-------------------|------|-----------------------|------|
| Sample size  | 39                           |      | 38             |      | 34                |      | 32                    |      |
| Year of survey                                     | 1991                         | 1998 | 1991           | 1998 | 1991              | 1998 | 1991                  | 1998 |
| Question   | %                            | %    | %              | %    | %                 | %    | %                     | %    |
| A: Lifetime  |                              |      |                |      |                   |      |                       |      |
| Gambling has been a hobby and an interest for me   | 90                           | 77   | 81             | 69   | 65                | 53   | 63                    | 38   |
| When I finished gambling, I have felt guilty       | 49                           | 48   | 26             | 21   | 3                 | 3    | 6                     | 0    |
| I daydreamed about getting a big win               | 88                           | 77   | 92             | 95   | 76                | 73   | 79                    | 63   |
| When I felt depressed, I used gambling to escape   | 36                           | 13   | 18             | 16   | 0                 | 0    | 0                     | 0    |
| I have felt that my gambling was a problem         | 33                           | 15   | 16             | 12   | 0                 | 3    | 0                     | 0    |
| After losing at gambling, I felt depressed         | 56                           | 33   | 37             | 8    | 6                 | 0    | 0                     | 0    |
| My gambling has given me pleasure and fun          | 92                           | 82   | 92             | 87   | 88                | 74   | 72                    | 78   |
| I went for help with my gambling                   | 0                            | 0    | 3              | 0    | 0                 | 0    | 0                     | 0    |
| B: Past Six Months                                 |                              |      |                |      |                   |      |                       |      |
| Gambling has been a hobby and an interest          | 72                           | 69   | 63             | 47   | 53                | 57   | 47                    | 28   |
| When I finished gambling, I have felt guilty       | 15                           | 10   | 16             | 5    | 3                 | 3    | 3                     | 0    |
| I have daydreamed about getting a big win          | 82                           | 64   | 84             | 79   | 65                | 71   | 66                    | 56   |
| When I felt depressed, I used gambling to escape   | 20                           | 5    | 3              | 5    | 0                 | 0    | 0                     | 0    |
| I have felt that my gambling was a problem         | 15                           | 5    | 3              | 5    | 0                 | 3    | 0                     | 0    |
| After losing heavily at gambling, I felt depressed | 21                           | 10   | 13             | 3    | 0                 | 0    | 0                     | 0    |
| My gambling has given me pleasure and fun          | 84                           | 69   | 87             | 71   | 82                | 59   | 63                    | 56   |

I went for help with  
my gambling

0

0

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0

**Table 2: Interpersonal/Family**

| Classification   | <u>Probable Pathological</u> |      | <u>Problem</u> |      | <u>Continuous</u> |      | <u>Non-continuous</u> |      |
|--|------------------------------|------|----------------|------|-------------------|------|-----------------------|------|
| Sample size  | 39                           |      | 38             |      | 34                |      | 32                    |      |
| Year of survey   | 1991                         | 1998 | 1991           | 1998 | 1991              | 1998 | 1991                  | 1998 |
| Question   | %                            | %    | %              | %    | %                 | %    | %                     | %    |
| A: Lifetime  |                              |      |                |      |                   |      |                       |      |
| My gambling has given me something to talk about with family and friends                 | 69                           | 59   | 74             | 52   | 53                | 41   | 50                    | 19   |
| I have gone gambling with friends or family  | 92                           | 71   | 87             | 58   | 53                | 38   | 47                    | 31   |
| My friends or family have criticised my gambling   | 44                           | 28   | 18             | 13   | 6                 | 0    | 0                     | 0    |
| My gambling has caused arguments about money with family or friends                      | 26                           | 21   | 19             | 5    | 0                 | 3    | 0                     | 0    |
| When I have lost at gambling, I have bragged about winning                               | 23                           | 10   | 11             | 16   | 3                 | 0    | 0                     | 3    |
| I have hidden betting slips, lottery tickets, gambling money, etc from family or friends | 21                           | 13   | 19             | 8    | 0                 | 0    | 0                     | 3    |
| My gambling has caused problems for my family or friends                                 | 18                           | 13   | 8              | 5    | 0                 | 0    | 0                     | 0    |
| My gambling has felt more Important to me than socialising with my friends or family     | 21                           | 8    | 13             | 5    | 3                 | 0    | 0                     | 0    |
| I have told lies about my gambling   | 26                           | 10   | 18             | 8    | 3                 | 0    | 0                     | 0    |
| My gambling caused the breakup of an important relationship                              | 5                            | 0    | 0              | 0    | 0                 | 0    | 0                     | 0    |
| B: Past Six Months   |                              |      |                |      |                   |      |                       |      |
| My gambling has given me something to talk about with family and friends                 | 56                           | 44   | 53             | 45   | 38                | 30   | 44                    | 13   |
| I have gone gambling with friends or family  | 57                           | 49   | 63             | 37   | 47                | 23   | 38                    | 19   |
| My family or friends have criticised my gambling   | 13                           | 13   | 5              | 8    | 3                 | 0    | 0                     | 0    |

|  |   |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|---|
| My gambling has caused arguments about money with family or friends                  | 5 | 5 | 8 | 3 | 0 | 0 | 0 | 0 |
| When I have lost at gambling I have bragged about winning                            | 5 | 5 | 8 | 5 | 0 | 0 | 0 | 3 |
| I have hidden betting slips, lottery tickets, etc from family or friends             | 8 | 5 | 8 | 3 | 0 | 0 | 0 | 0 |
| My gambling has caused problems for my family or friends                             | 5 | 8 | 0 | 3 | 0 | 0 | 0 | 0 |
| My gambling has felt more important to me than socialising with my family or friends | 0 | 5 | 5 | 3 | 0 | 0 | 0 | 0 |
| I have told lies about my gambling   | 8 | 0 | 3 | 3 | 0 | 0 | 0 | 0 |
| My gambling has caused the breakup of an important relationship                      | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Table 3: Vocational/Employment**

| Classification   | <u>Probable Pathological</u> |      | <u>Problem</u> |      | <u>Continuous</u> |      | <u>Non-continuous</u> |      |
|--|------------------------------|------|----------------|------|-------------------|------|-----------------------|------|
| Sample Size  | 39                           |      | 38             |      | 34                |      | 32                    |      |
| Year of survey   | 1991                         | 1998 | 1991           | 1998 | 1991              | 1998 | 1991                  | 1998 |
| Question   | %                            | %    | %              | %    | %                 | %    | %                     | %    |
| A: Lifetime  |                              |      |                |      |                   |      |                       |      |
| Thinking about gambling has got me through a boring job                  | 41                           | 23   | 29             | 16   | 6                 | 3    | 9                     | 0    |
| I have lost time from work/study due to gambling                         | 18                           | 3    | 11             | 5    | 6                 | 0    | 0                     | 0    |
| Thinking about my gambling has stopped me working efficiently at my job. | 18                           | 3    | 8              | 0    | 3                 | 0    | 0                     | 0    |
| I have moved/changed jobs because of problems over my gambling           | 3                            | 0    | 0              | 0    | 0                 | 0    | 0                     | 0    |
| Gambling is something we all talk about at work                          | 67                           | 31   | 55             | 37   | 27                | 35   | 31                    | 6    |
| I have gone gambling with people from work                               | 56                           | 36   | 50             | 18   | 32                | 12   | 34                    | 6    |

|   |    |    |    |    |   |    |    |   |
|---|----|----|----|----|---|----|----|---|
| I have been sacked from my job because of my gambling                   | 0  | 0  | 0  | 0  | 0 | 0  | 0  | 0 |
| Being a person who gambles has helped me get on at work                 | 31 | 13 | 13 | 11 | 3 | 0  | 0  | 0 |
| <hr/>   |    |    |    |    |   |    |    |   |
| B: Past Six Months  |    |    |    |    |   |    |    |   |
| Thinking about gambling has helped me get through a boring job          | 21 | 15 | 21 | 13 | 3 | 3  | 3  | 0 |
| I have lost time from work/study due to gambling                        | 3  | 0  | 0  | 5  | 0 | 0  | 0  | 0 |
| Thinking about my gambling has stopped me working efficiently at my job | 3  | 0  | 5  | 0  | 3 | 0  | 0  | 0 |
| I have moved/changed jobs because of problems over my gambling          | 3  | 0  | 0  | 0  | 0 | 0  | 0  | 0 |
| Gambling is something we all talk about at work                         | 36 | 18 | 39 | 34 | 6 | 24 | 16 | 3 |
| I have gone gambling with people from work                              | 26 | 10 | 24 | 8  | 9 | 6  | 22 | 3 |
| I have been sacked from my job because of my gambling                   | 0  | 0  | 0  | 0  | 0 | 0  | 0  | 0 |
| Being a person who gambles has helped me get on at work                 | 10 | 8  | 11 | 8  | 0 | 0  | 0  | 0 |

**Table 4: Financial**

| Classification   | <u>Probable Pathological</u> |      | <u>Problem</u> |      | <u>Continuous</u> |      | <u>Non-continuous</u> |      |
|--|------------------------------|------|----------------|------|-------------------|------|-----------------------|------|
| Sample size  | 39                           |      | 38             |      | 34                |      | 32                    |      |
| Year of survey   | 1991                         | 1998 | 1991           | 1998 | 1991              | 1998 | 1991                  | 1998 |
| Question   | %                            | %    | %              | %    | %                 | %    | %                     | %    |
| A: Lifetime  |                              |      |                |      |                   |      |                       |      |
| Winning at gambling has helped me financially            | 31                           | 23   | 18             | 13   | 21                | 0    | 9                     | 13   |
| Family or friends have had to pay my debts from gambling | 5                            | 5    | 5              | 0    | 0                 | 0    | 0                     | 0    |

|   |    |    |    |    |    |   |   |   |
|---|----|----|----|----|----|---|---|---|
| I have borrowed money and not paid it back because of my gambling | 15 | 5  | 5  | 0  | 0  | 0 | 0 | 0 |
| I have spent more than I could afford on my gambling              | 51 | 18 | 32 | 11 | 6  | 3 | 3 | 0 |
| I won more than I have lost at gambling                           | 23 | 21 | 21 | 16 | 21 | 9 | 3 | 6 |
| I have had a big win (\$1,000+) from gambling                     | 15 | 10 | 16 | 13 | 15 | 0 | 0 | 0 |
| I have gambled to try and win money to pay off debts              | 31 | 15 | 18 | 8  | 6  | 0 | 3 | 3 |
| I have borrowed money to gamble or to pay gambling debts          | 18 | 8  | 3  | 0  | 0  | 0 | 0 | 0 |
| <hr/>   |    |    |    |    |    |   |   |   |
| B. Past Six Months  |    |    |    |    |    |   |   |   |
| Winning at gambling has helped me financially                     | 15 | 15 | 11 | 3  | 12 | 0 | 3 | 6 |
| Family or friends have had to pay off my debts from gambling      | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 |
| I have borrowed money and not paid it back because of my gambling | 3  | 0  | 0  | 0  | 0  | 0 | 0 | 0 |
| I have spent more than I could afford on my gambling              | 16 | 8  | 11 | 3  | 3  | 3 | 0 | 0 |
| I won more than I have lost gambling                              | 8  | 12 | 13 | 13 | 6  | 3 | 0 | 3 |
| I have had a big win (\$1,000+) from gambling                     | 3  | 5  | 0  | 3  | 0  | 0 | 0 | 0 |
| I have gambled to try and win money to pay off debts              | 10 | 10 | 3  | 3  | 6  | 0 | 3 | 3 |
| I have borrowed money to gamble or to pay gambling debts          | 3  | 0  | 0  | 0  | 0  | 0 | 0 | 0 |

**Table 5: Legal**

| Classification   | <u>Probable Pathological</u> |      | <u>Problem</u> |      | <u>Continuous</u> |      | <u>Non-continuous</u> |      |
|--|------------------------------|------|----------------|------|-------------------|------|-----------------------|------|
| Sample size  | 39                           |      | 38             |      | 34                |      | 32                    |      |
| Year of survey   | 1991                         | 1998 | 1991           | 1998 | 1991              | 1998 | 1991                  | 1998 |
| Question   | %                            | %    | %              | %    | %                 | %    | %                     | %    |
| A: Lifetime  |                              |      |                |      |                   |      |                       |      |
| I have thought about doing something illegal to get money for gambling or gambling debts | 8                            | 3    | 3              | 5    | 0                 | 0    | 0                     | 0    |
| I have borrowed money without permission or authority so I could gamble                  | 8                            | 8    | 8              | 3    | 0                 | 0    | 0                     | 0    |
| My gambling has led to problems with the police  | 0                            | 3    | 0              | 0    | 0                 | 0    | 0                     | 0    |
| I have appeared in court on charges related to my gambling                               | 0                            | 0    | 0              | 0    | 0                 | 0    | 0                     | 0    |
| I have been in prison because of crimes related to my gambling                           | 0                            | 0    | 0              | 0    | 0                 | 0    | 0                     | 0    |
| B: Past Six Months   |                              |      |                |      |                   |      |                       |      |
| I have thought about doing something illegal to get money for gambling or gambling debts | 5                            | 3    | 3              | 0    | 0                 | 0    | 0                     | 0    |
| I have borrowed money without permission or authority so I could gamble                  | 0                            | 0    | 0              | 0    | 0                 | 0    | 0                     | 0    |
| My gambling has led to problems with the police  | 0                            | 0    | 0              | 0    | 0                 | 0    | 0                     | 0    |
| I have appeared in court on charges related to my gambling                               | 0                            | 0    | 0              | 0    | 0                 | 0    | 0                     | 0    |
| I have been in prison because of crimes related to my gambling                           | 0                            | 0    | 0              | 0    | 0                 | 0    | 0                     | 0    |

**Table 6: Gambling Characteristics**

| Classification | <u>Probable Pathological</u> | <u>Problem</u> | <u>Continuous</u> | <u>Non-continuous</u> |
|----------------|------------------------------|----------------|-------------------|-----------------------|
|----------------|------------------------------|----------------|-------------------|-----------------------|



| Sample size   | 39   |      | 38   |      | 34   |      | 32   |      |
|---|------|------|------|------|------|------|------|------|
| Year of survey  | 1991 | 1998 | 1991 | 1998 | 1991 | 1998 | 1991 | 1998 |
| Question  | %    | %    | %    | %    | %    | %    | %    | %    |
| A: Lifetime   |      |      |      |      |      |      |      |      |
| After losing at gambling I have gone back another day to win back my money                          | 67   | 13   | 21   | 5    | 12   | 3    | 13   | 0    |
| Each time I started to gamble I expected to win   | 82   | 51   | 74   | 53   | 53   | 41   | 44   | 31   |
| My gambling has been skillful   | 62   | 49   | 29   | 28   | 27   | 6    | 9    | 13   |
| When I gambled, I have gone on for longer than I planned  | 82   | 41   | 55   | 24   | 21   | 9    | 10   | 10   |
| I have felt like stopping gambling but didn't think I could   | 26   | 14   | 18   | 11   | 0    | 3    | 3    | 3    |
| When I was gambling I felt excited  | 92   | 79   | 90   | 76   | 77   | 47   | 50   | 47   |
| When I was gambling I felt relaxed  | 69   | 67   | 74   | 63   | 53   | 50   | 44   | 38   |
| When I have a disappointing or frustrating day I was more likely to go and gamble                   | 31   | 13   | 18   | 8    | 3    | 3    | 3    | 0    |
| When I was losing, if I had urgent debts, I would go on gambling longer                             | 29   | 10   | 11   | 5    | 0    | 0    | 0    | 0    |
| I was more likely to go and gamble if I had some good luck and wanted to celebrate                  | 69   | 51   | 55   | 34   | 41   | 6    | 34   | 16   |
| When I had lost more money than I had planned, I was more likely to go on gambling if I was excited | 33   | 18   | 26   | 8    | 6    | 0    | 3    | 0    |
| B: Past Six Months  |      |      |      |      |      |      |      |      |
| After losing at gambling I have gone back another day to win back my money                          | 37   | 8    | 11   | 5    | 3    | 3    | 9    | 0    |
| Each time I started gambling I expected to win  | 74   | 46   | 61   | 45   | 41   | 38   | 41   | 28   |
| My gambling has been skillful   | 41   | 39   | 21   | 24   | 21   | 3    | 6    | 6    |
| When I have gambled I have gone on longer than I planned  | 28   | 23   | 26   | 13   | 6    | 6    | 3    | 0    |

|   |    |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|----|
| I have felt like stopping gambling but didn't think I could   | 10 | 8  | 11 | 8  | 0  | 3  | 0  | 3  |
| When I was gambling I felt excited  | 72 | 64 | 78 | 55 | 68 | 36 | 41 | 34 |
| When I was gambling I felt relaxed  | 57 | 56 | 66 | 55 | 50 | 44 | 41 | 31 |
| When I have had a disappointing or frustrating day I was more likely to go and gamble               | 18 | 7  | 3  | 6  | 0  | 3  | 3  | 0  |
| When I was losing, if I had urgent debts, I would go on gambling longer                             | 13 | 5  | 0  | 0  | 0  | 0  | 0  | 0  |
| I was more likely to go and gamble if I had some good luck and wanted to celebrate                  | 49 | 31 | 48 | 21 | 30 | 6  | 19 | 6  |
| When I had lost more money than I had planned, I was more likely to go on gambling if I was excited | 13 | 8  | 8  | 3  | 0  | 0  | 3  | 0  |

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