GAMBLING AND PROBLEM GAMBLING IN NEVADA

Report to the Nevada Department of Human Resources

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EXECUTIVE SUMMARY

This report presents the findings of a state-wide survey of gambling participation and gambling-related problems in Nevada. The main purpose of this study was to provide estimates of the prevalence and distribution of problem gambling among Nevada citizens for the first time. The results of this study are intended to assist the State in determining potential public policy and/or State programs to implement to address problem gambling in Nevada.

Problem gambling is a broad term that refers to all of the patterns of gambling behavior that compromise, disrupt or damage personal, family or vocational pursuits. Pathological gambling lies at one end of a continuum of problematic gambling involvement. Pathological gambling is a treatable mental disorder characterized by loss of control over gambling, chasing of losses, lies and deception, family and job disruption, financial bailouts and illegal acts.

Methods

The present study was completed in three stages. These included (1) finalizing the questionnaire and sampling frame, (2) collecting the data, and (3) analyzing the data and interpreting the findings. Gemini Research, Ltd., the only organization internationally that specializes in conducting studies of gambling and problem gambling in the population, was responsible for managing the project, drafting the questionnaire and designing the sampling frame, analyzing the data and drafting this report. Data collection was carried out by the Cannon Center for Survey Research at the University of Nevada Las Vegas.

The sampling strategy for this study was designed to compensate for the relatively rare occurrence of problem gambling in the general population and is known as a "two-phase probability sample." The first phase involved identifying approximately 2,200 residential households with telephones in Nevada and selecting one eligible adult in each household to respond to a brief screening interview. The second phase involved selecting a stratified random group of 733 respondents from the first phase for a lengthier interview. The response rate for the survey was adequate and the sample is representative of the adult population of Nevada.

Gambling in Nevada

- The types of gambling that Nevada residents are most likely to have tried are gambling at a casino, playing lottery games (which are not legal in Nevada) and gambling on non-casino gaming machines. The types of gambling that Nevadans are most likely to engage in on a monthly basis are casino games and non-casino gaming machines. Nearly one-fifth (19%) of the adult Nevada population gambles once a week or more often and most of this gambling is at casinos.

- While past year casino gambling and non-casino machine gambling are much higher in Nevada than in the United States generally, the reverse is true for lottery play. With these exceptions, past year participation in most gambling activities is slightly lower in Nevada than in the United States generally.

- Non-gamblers and infrequent gamblers in Nevada are most likely to be female, under the age of 35 and Hispanic. Non-gamblers and infrequent gamblers in Nevada are also most likely to have annual household incomes under $35,000.

- Monthly and weekly gamblers in Nevada are most likely to be male, over the age of 55 and White. Monthly and weekly gamblers in Nevada are most likely to have annual household incomes over $35,000.

- Respondents from different ethnic groups in Nevada give different reasons for gambling. White and Hispanic respondents are most likely to say that entertainment is an important reason why they gamble while Black respondents are most likely to say they gamble in order to win money. There are also differences in reasons that non-gamblers give for not gambling. Hispanic non-gamblers are most likely to refrain for moral reasons while Black non-gamblers are most likely to refrain for financial reasons.

Problem Gambling in Nevada

- Two different screens were used to identify problem and pathological gamblers in Nevada. The current South Oaks Gambling Screen (SOGS) was used to provide comparability with the large number of surveys based on this screen. The NORC DSM Screen for Gambling Problems (NODS) was used to provide a measure of problem gambling in Nevada based on the most recent psychiatric criteria for pathological gambling.

- Research on the performance of these problem gambling screens indicates that the lifetime versions are excellent clinical screens while the current versions are probably more useful for detecting rates of change in problem gambling prevalence over time. Consequently, the current SOGS is used as the primary measure of the prevalence of problem and pathological gambling in the adult Nevada population while the lifetime NODS is used as the primary measure to describe the clinically relevant characteristics of problem and pathological gamblers in Nevada.

- Based on the current SOGS, the prevalence of probable pathological gambling in Nevada in 2000 is 3.5% and the prevalence of problem gambling is 2.9% (see Table 11 in the full report).

- The combined prevalence of current problem and probable pathological gambling in Nevada in 2000 is 6.4%. Comparable combined prevalence rates of problem and probable pathological gambling from surveys completed in the last five years range from 2.1% in North Dakota in 2000 to 4.9% in Mississippi in 1996.

- Based on the lifetime NODS, the prevalence of pathological gambling in Nevada in 2000 is 2.1% and the prevalence of problem gambling is 3.0% (see Table 21 in the full report). The most widely cited prevalence rates based on the NODS come from the recent national survey. The prevalence of pathological gambling in the United States in 1998 was 1.2% while the prevalence of problem gambling was 1.5%.

- Based on the current SOGS prevalence rates, we estimate that between 40,100 and 63,900 Nevada residents can be classified as current probable pathological gamblers. In addition, between 32,700 and 53,500 Nevada residents can be classified as current problem gamblers.

- Based on the current SOGS prevalence rates, problem gambling in Nevada is highest among men, among adults aged 18 to 34, and among minorities. Problem gambling prevalence rates are also high among those employed in the gaming industry, among those with a high school education or less and among those with annual household incomes under $35,000.

- The prevalence of problem gambling is higher among individuals who have lived in Nevada for 10 years or less compared with people who were born in Nevada or have lived in the state for more than a decade.

- Past year problem gambling prevalence rates in Nevada are highest among individuals who have gambled in the past year on non-casino gaming machines, non-casino bingo and horse or dog races as well as among those who have gambled in the past year at commercial cardrooms.

Comparing Non-Problem and Problem Gamblers

- Based on the lifetime NODS, the problem gamblers in Nevada most likely to be in need of services are significantly more likely than non-problem gamblers to be male, under the age of 25, non-White, never married and employed in the gaming industry. Problem gamblers in Nevada are significantly less likely than non-problem gamblers to have lived in Nevada for more than a decade.

- Problem gamblers in Nevada are significantly more likely than non-problem gamblers to have gambled in the past year as well as on a regular basis at a casino and on non-casino gaming machines as well as privately, at a cardroom and on horse or dog races.

- Problem gamblers in Nevada are significantly more likely than non-problem gamblers to have been troubled in the past year by the gambling of someone they live with, to have been involved in arguments about their own gambling, and to have ever been arrested or incarcerated.

- Problem gamblers in Nevada are significantly more likely than non-problem gamblers to smoke daily, and to use marijuana on a monthly basis. In spite of similar rates of weekly alcohol consumption, problem gamblers in Nevada are significantly more likely than non-problem gamblers to report experiencing problems in the past year due to their use of alcohol and to ever have sought help for an emotional or substance abuse problem. Finally, problem gamblers in Nevada are significantly more likely than non-problem gamblers to have ever experienced episodes of mania or depression.

- Compared with individuals who have sought assistance from the Nevada Problem Gambling HelpLine, problem gamblers in the general population are younger, more ethnically diverse and less likely to be female.

Directions for the Future

The impacts of problem gambling can be high, for families and communities as well as for individuals. Pathological gamblers experience physical and psychological stress and exhibit substantial rates of depression, alcohol and drug dependence and suicidal ideation. The families of problem and pathological gamblers experience physical and psychological abuse as well as harassment and threats from bill collectors and creditors. Other significant impacts include costs to employers, creditors, insurance companies, social service agencies and the civil and criminal justice systems.

Given the prevalence of problem and pathological gambling in Nevada, policymakers and other concerned parties may wish to consider a range of ameliorative measures. These include extending health insurance coverage to cover problem gambling treatment, fostering responsible gambling policies and programs by the gambling industries and developing government-industry initiatives to address this issue, expanding training opportunities for treatment professionals, establishing a gambling counselor certification program, increasing funding to the Nevada Department of Human Resources to support public education and prevention services as well as problem gambling treatment, and continued monitoring of gambling and problem gambling prevalence to assess the impacts of legal gambling on the residents of Nevada.

INTRODUCTION

Since the 1960s, the availability of gambling has grown ten-fold in the United States. Today, a person can make a legal wager of some sort in every state except Utah, Tennessee, and Hawaii; 37 states have lotteries, 28 states have casinos and 22 states have off-track betting (National Gambling Impact Study Commission, 1999). Just as telling as the expansion of gambling into new jurisdictions is the growth of the gambling industries. Between 1975 and 2000, revenues from legal wagering in the United States grew twenty-fold, from $3 billion to $61 billion while gambling expenditures more than doubled as a percentage of personal income (Christiansen, 1998; Christiansen & Sinclair, 2001; Kallick et al, 1976).

The main purpose of this study, funded by the Nevada Department of Human Resources, is to provide estimates of the prevalence and distribution of problem gambling among Nevada citizens for the first time. The results of this study are intended to assist the State in determining potential public policy and/or State programs to implement to address problem gambling in Nevada.

This report is organized into several sections for clarity of presentation. The **Introduction** includes a definition of the terms used in the report and background information on gambling and problem gambling in Nevada. The **Methods** section addresses the details of conducting the survey. The next four sections present findings from the survey in the following areas:

- gambling in Nevada;
- prevalence of problem gambling in Nevada;
- comparing non-problem and problem gamblers in Nevada; and
- comparing the performance of two problem gambling screens in Nevada.

Defining Our Terms

Gambling is a broad concept that includes diverse activities, undertaken in a wide variety of settings, appealing to different sorts of people and perceived in various ways by participants and observers. Failure to appreciate this diversity can limit scientific understanding and investigation of gambling and gambling problems. Another reason to note the differences between various forms of gambling arises from accumulating evidence that some types of gambling are more strongly associated with gambling-related problems than others (Abbott & Volberg, 1999a).

People take part in gambling activities because they enjoy them and obtain benefits from their participation. For most people, gambling is generally a positive experience. However, 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, 1999a).

Pathological gambling was first included in the third edition of the Diagnostic and Statistical Manual (DSM-III) of the American Psychiatric Association (1980). Each subsequent revision of this manual has seen changes in the diagnostic criteria for pathological gambling. The essential features of pathological gambling are presently defined by the American Psychiatric Association (1994) as:

- 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.

A formal diagnosis of pathological gambling is arrived at by an appropriately qualified and experienced clinician following an extensive clinical interview. To make a diagnosis of pathological gambling, a clinician must determine that a patient has met five or more of the ten diagnostic indicators associated with pathological gambling. Table 1 presents the diagnostic criteria for pathological gambling:

Table 1: Diagnostic Criteria for Pathological Gambling

Persistent and recurrent maladaptive gambling behavior as indicated by five (or more) of the following:	
Preoccupation	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)
Tolerance	Needs to gamble with increasing amounts of money in order to achieve the desired excitement
Withdrawal	Restlessness or irritability when attempting to cut down or stop gambling
Escape	Gambling as a way of escaping from problems or relieving dysphoric mood (e.g. feelings of helplessness, guilt, anxiety or depression)
Chasing Losses	After losing money gambling, often return another day in order to get even ("chasing one's losses)
Lying	Lies to family members, therapists or others to conceal the extent of involvement with gambling
Loss of Control	Made repeated unsuccessful efforts to control, cut back or stop gambling
Illegal Acts	Committed illegal acts, such as forgery, fraud, theft or embezzlement, in order to finance gambling
Risked Significant Relationship	Jeopardized or lost a significant relationship, job, educational or career opportunity because of gambling
Bailout	Reliance on others to provide money to relieve a desperate financial situation caused by gambling
The gambling behavior is not better accounted for by a Manic Episode.	

The term problem gambling is used in a variety of ways. In some situations, its use is limited to those whose gambling-related difficulties are less serious than those of pathological gamblers. In other situations, it is used to indicate all of the patterns of gambling behavior that compromise, disrupt or damage personal, family or vocational pursuits (Cox et al, 1997; Lesieur, 1998). From this perspective, pathological gambling can be regarded as a sub-category, or one end of a continuum, of gambling-related problems. Problem gamblers, as well as individuals who score even lower on problem gambling screens (at-risk gamblers) are of concern because they represent much larger proportions of the population than pathological gamblers. These groups are also of interest because of the possibility that their gambling-related difficulties may become more severe over time.

In considering the public health risks of problem gambling, it is important to note that not all of the features of problem or pathological gambling need be present at one point in time

(Abbott & Volberg, 1999a; Gerstein et al, 1999). Some of the impacts that at-risk, problem and pathological gamblers may experience include psychological difficulties, such as anxiety, depression, guilt, exacerbation of alcohol and drug problems and attempts at suicide as well as stress-related physical illnesses such as hypertension and heart disease. Interpersonal problems include arguments with family, friends and co-workers and breakdown of relationships, often culminating in separation or divorce. Job and school problems include poor work performance, abuse of leave time and loss of job. Financial effects loom large and include reliance on family and friends, substantial credit card debt, unpaid creditors and bankruptcy. Finally, there may be legal problems as a result of criminal behavior undertaken to obtain money to gamble or pay gambling debts (Lesieur, 1998; Volberg, 2001a).

Measuring Gambling Problems

State governments began funding services for individuals with gambling problems in the 1980s. As a first step toward establishing these services, policy makers sought information about the number of people who might seek help for their gambling problems and what they looked like. In responding to these questions, researchers adopted methods from the field of psychiatric epidemiology to investigate the prevalence of gambling problems in the general population.

In the 1980s, few tools existed to measure gambling problems and only one, the South Oaks Gambling Screen, (SOGS) had been rigorously developed and tested for performance (Lesieur & Blume, 1987). The SOGS was first used in a prevalence survey in New York State in 1986 (Volberg & Steadman, 1988). Since then, the SOGS and subsequent modifications of the original screen have been used in problem gambling prevalence surveys in more than 45 jurisdictions in the United States, Europe, Canada and Asia (Abbott & Volberg, 1996, 2000; Bondolfi, Osiek & Ferrero, 2000; Productivity Commission, 1999; Shaffer, Hall & Vander Bilt, 1999; Sproston, Erens & Orford, 2000; Volberg et al, 2001).

With the publication of revised psychiatric criteria for pathological gambling in 1994, development began on a number of new screens for problem and pathological gambling (Cunningham-Williams et al, 1998; Fisher, 2000; Gerstein et al, 1999; Shaffer et al, 1994; Winters, Specker & Stinchfield, 1997). In part, these tools emerged in response to perceived shortcomings of the SOGS. They also reflect a concern to have screening instruments based on the most recent diagnostic criteria. Despite this proliferation, the psychometric properties of most of these tools have yet to be fully examined.

In problem gambling prevalence surveys, individuals are generally categorized as problem gamblers or probable pathological gamblers on the basis of their responses to the questions in one of the screens developed to identify individuals with gambling-related difficulties. In this report and elsewhere, use of the term probable distinguishes the results of prevalence surveys, where classification is based on a telephone interview, from a clinical diagnosis.

Considerations in Designing Prevalence Studies

On the face of it, finding out how many people there are in a community with serious gambling problems is straightforward. You select a random sample of people from the population, assess them using a valid problem gambling measure and carry out some

elementary statistical analyses to generate a prevalence estimate. In reality, for a variety of financial and technical reasons, things are not so simple.

One concern is that the sample sizes employed in nearly all gambling surveys to date have been far too small. Large sample sizes are needed to detect differences between sub-groups in the population at greatest risk for gambling problems. With small sample sizes, the confidence intervals associated with prevalence estimates tend to be quite large. In the case of many sub-groups within these studies, these error terms may be so large that little confidence can be placed in the findings. Most gambling researchers agree that it is essential to interview large samples of respondents to establish reliable prevalence estimates, particularly for sub-groups in the population.

Another concern is that, with the exception of a recent national survey in Sweden (Rönnberg et al, 1999; Volberg et al, 2001), all of the problem gambling prevalence studies conducted to date have employed complex sample designs (i.e. random selection of single respondents within randomly selected households). While this approach reduces the cost of a study, it also means that the sample varies from what would be attained if truly random sampling of the population had occurred. While complex designs are not problematic in terms of establishing point estimates such as means, medians or percentages, the confidence intervals associated with these measures are typically greatly under-estimated. This concern has led to the growing involvement of statistical experts in problem gambling prevalence surveys. Statisticians provide essential expertise in the appropriate calculation of standard errors and confidence intervals. Statisticians have also introduced new tools for identifying risk factors related to gambling problems in the general population.

Finally, given uncertainty about the characteristics of individuals who choose not to participate in surveys, it is desirable to attain the highest possible response rates in gambling surveys. This means budgeting for and completing substantial callbacks to eligible respondents. This also means employing interviewers with demonstrated success at completing lengthy interviews and experience in converting refusals. All of these measures mean that problem gambling prevalence surveys now cost more to carry out than they have in the past and require much more careful planning.

Gambling and Problem Gambling in Nevada: Background

Throughout the world, gambling participation and attitudes toward gambling are linked to the communities in which these behaviors occur and to the norms and values of members of those communities. Differences have been found in the types of gambling preferred by middle-class and blue-collar gamblers, by white and black Americans and by men and women (Dixey, 1996; Drake & Cayton, 1945; Henslin, 1967; Hraba & Lee, 1996; Light, 1977; Zola, 1964). It is equally important to note that individual and community definitions of gambling can vary widely. For example, a recent Gallup poll found that 52% of respondents defined stock market investment as a form of gambling while 22% did not consider buying state-sponsored lottery tickets to be gambling (Gallup, 1999).

Longstanding ambivalence characterizes the history of gambling in the United States, as successive waves of leniency alternate with severe repression (Rose, 1986). In the early Nineteenth Century, the risky and transient society of river towns and steamboats along the lower Mississippi River fostered the emergence of professional gamblers and

new games characterized by speed and portability. In the mid-Nineteenth Century, as newly settled areas sought to emulate more established and respectable communities in the East, professional gamblers became the focus of violent popular justice throughout the Southwest. In the same period, casino gambling flourished on the mining frontier in California and newly popular games, such as poker and craps, were introduced by syndicates to cities in the East (Findlay, 1986). In the wake of the Civil War, a few destitute Southern states, such as Louisiana, authorized privately run lotteries (Clotfelter & Cook, 1989). It was not until the end of the Nineteenth Century, with the ascendancy of Victorian respectability and the spectacular collapse of the Louisiana Lottery, that casino games and lotteries were outlawed throughout the United States. In the wake of federal legislation intended to eliminate fraudulent games, legal gambling opportunities were heavily restricted throughout the United States and remained so for most of the Twentieth Century (Rose, 1986).

Gambling in Nevada

Nevada returned casino gambling to legal status in 1931, well ahead of the most recent wave of gambling legalization, which began in the 1960s (Preston et al, 1998; Rose, 1986). Researchers have argued that a national recession and widespread but illegal frontier gambling were important factors in the return of legal gambling to Nevada. Casino gaming did not expand rapidly in Nevada until after World War II and it would be another 30 years before casino gambling became legal in any other state. By the 1970s, Nevada had established oversight, regulatory and enforcement procedures to ensure that casino gambling operated legitimately and to the substantial economic benefit of the citizens of Nevada. With the expansion of lottery and casino gambling in many other U.S. jurisdictions, recent efforts have been made to diversity the Nevada economy. However, the state remains heavily dependent on tourism and gaming (DePolo & Pingle, 1997).

There are three major casino markets in Nevada, including Las Vegas and Laughlin in the south and Reno-Lake Tahoe in the north. Casinos in Nevada range from full-service, resort style operations appealing primarily to tourists to those appealing to local markets. Casinos in Nevada offer table games, slot machines and legal bookmaking operations for sports and horseracing. In addition to casinos, several other types of gambling are legal in Nevada. These include live bingo and keno, cardrooms, non-casino gaming devices (e.g. slot machines located in grocery stores, department stores, bars, restaurants and other venues), sports betting and horserace wagering at live tracks, at off-track-betting facilities and via telephone. There are also a number of Indian casinos in Nevada (McQueen, 1999). In contrast to many other states, Nevada does not operate a state lottery. All of the states contiguous to Nevada operate state lotteries, with the exception of Utah.

In an effort to predict the impact of increases in the availability of legal gambling, the 1975 national research team included a supplementary sample of Nevada residents (n=296) in their survey. This sample was screened to exclude individuals who had moved to Nevada in order to gamble (Kallick et al, 1976). While the researchers found that the rate of past year gambling participation among Nevada residents was significantly higher than in the national sample (78% compared to 61%), they concluded that there was much less illegal gambling in Nevada than in the nation as a whole. Their explanation was that in Nevada, legal commercial facilities served as a substitute for both illegal betting and private betting with friends. The 1975 research team also

concluded that, in contrast to the national sample, Nevada residents were less likely than the national sample to regard gambling as a recreational activity and more likely to regard it as a secondary occupation.

Since 1989, the Las Vegas Convention and Visitors Authority (LVCVA) has funded biennial surveys to assess the gambling behavior of Clark County residents. These surveys include telephone interviews with 1,200 respondents selected randomly from Clark County households (GLS Research, 1998). In 1997-98, these researchers found that 28% of the respondents had not gambled in the past year, 38% gambled at least occasionally and 34% gambled once a week or more often. Among respondents who gambled, video poker was the most preferred activity followed by slot machines. While respondents who gambled were most likely to do so at a casino, they were less likely to gamble at casinos on the Strip or in Downtown Las Vegas than elsewhere in the city. Approximately a third of the respondents had purchased an out-of-state lottery ticket in the past year (most likely in Arizona or California) (GLS Research, 1998).

In spite of a supportive local culture, surveys of attitudes toward gambling among adults in Las Vegas have found that many residents believe that gambling represents a problem for significant numbers of people (Preston, Gazel & Bernhard, 1996).

Problem Gambling in Nevada

In the 1970s and 1980s, gambling legalization proceeded with little consideration of the potentially harmful impacts that gambling can have on individuals, families and communities. In the 1990s, however, prevalence surveys became an essential component in the establishment and monitoring of legal gambling in the United States and internationally (Abbott & Volberg, 1996, 2000; Bondolfi, Osiek & Ferrero, 2000; Gerstein et al, 1999; Productivity Commission, 1999; Shaffer, Hall & Vander Bilt, 1999; Sproston, Erens & Orford, 2000; Volberg, 1996; Volberg et al, 2001).

In spite of the long history of legal gambling in Nevada, there has been little research on problem gambling in the state. We noted above that a supplementary sample of Nevada residents was included in the national survey in 1975. Among the numerous items on the questionnaire for this survey was a scale intended to identify “probable compulsive gamblers” (Kallick et al, 1976). The 18-item instrument, developed from a discriminant analysis comparing members of Gamblers Anonymous with weekly church goers, pre-dated by six years the first recognition of pathological gambling by the medical profession (American Psychiatric Association, 1980). Table 2 presents prevalence rates for the national and Nevada samples (Kallick et al, 1976: Page 451, Table 12.9-3).

Table 2: Comparing Problem Gambling Rates in 1975

	National	Nevada
	(1736)	(296)
Probable Compulsive	0.8	2.6
Men	1.1	3.3
Women	0.5	2.0

Based on these data, the 1975 research team concluded that the prevalence of “probable compulsive gambling” was roughly three times higher among the Nevada residents than in the national sample. The 1975 research team further concluded that

women in Nevada were even more likely than men in the national sample to score as "probable compulsive gamblers."

There have been several interesting studies of problem gambling in Nevada although none can be generalized to the state as a whole. For example, a study of female pathological gamblers was carried out in Las Vegas in 1989 (Strachan & Custer, 1993). In contrast to Gamblers Anonymous membership generally at that time, women made up over 50% of the membership of Gamblers Anonymous in Las Vegas. The 52 women GA members who completed self-administered questionnaires for this study were primarily well-educated Whites in their 30s and 40s and the majority had lived in Las Vegas for 10 or more years. Two-thirds of the women were married and three-quarters had children. Two-thirds were employed and nearly half had worked in the gambling industry at some time. In contrast to other studies of pathological gambling and co-morbidity, only 10% of these women acknowledged an addiction to alcohol. However, nearly one-quarter of the women had been addicted to illicit drugs and 15% had been addicted to prescription medications. One-third had experienced parental divorce before the age of 15, 33% reported physical abuse as children and 29% reported childhood sexual abuse. Nearly a third of the women had lost a spouse, parent, child or close friend or relative in the two years prior to entering Gamblers Anonymous and 23% of the women had attempted suicide.

Another, more recent study examined the prevalence of problem gambling among low-income people in Las Vegas (Tekniepe, 1998). The study involved face-to-face interviews with a sample of 2,432 individuals attending an event organized to connect low-income individuals with social services. The questionnaire included items based on the ten DSM-IV criteria for pathological gambling and problem gambling was defined as a score of two or more on these items. The study found that homeless individuals were two times more likely to score as problem gamblers compared to individuals at risk for becoming homeless or the non-homeless (14.5% vs. 5.9% vs. 4.9%).

Finally, a recent analysis of callers to the Nevada Council on Problem Gambling helpline examined data from 118 individuals who called the Council's helpline between September, 1996 and April, 1997. While only 60% of these callers were concerned about their own gambling, women were more likely to call about themselves than about a spouse. Approximately two-thirds of the callers were male and an equal proportion were married or living in a stable relationship; three-quarters of the callers were White and 12% were Hispanic; the majority of the callers (78%) were between the ages of 26 and 54. While 70% of the callers stated that the primary gambling activity causing problems was slot machines or video poker, men were more likely than women to identify casino table games as the activity causing them problems. The author noted several limitations to the study, particularly the lack of information about gambling in general in Nevada which would facilitate comparisons of problem and non-problem gamblers within the state (Chen, 1998).

Although not confined to Nevada, one recent study of casino employees found higher rates of severe gambling problems, alcohol problems, tobacco use and depression than are found in the general population (Shaffer, Vander Bilt & Hall, 1999). Interestingly, casino employees were more likely than the general population to be probable pathological gamblers but less likely to be problem gamblers. These results are reminiscent of the finding by the 1975 national research team that while the prevalence of "probable compulsive gambling" was significantly higher among Nevada residents

than in the national sample, the prevalence of the less severe category of "potential compulsive gambling" was nearly identical to the national sample (Kallick et al, 1976).

Problem Gambling Services in Nevada[1]

This overview does not include every resource and initiative on problem gambling in Nevada. However, it does outline the major efforts presently underway to address this issue in Nevada.

In 1998, adoption of Nevada Gaming Regulation 5.170 led to the development of a substantial problem gambling public awareness campaign in Nevada. In response to the need for services generated by this regulation, the Nevada Council on Problem Gambling received a grant from the Nevada Resort Association to develop an employee awareness program. An estimated 115,000 gaming employees in Nevada have received training based on this module and the program has been incorporated into the curriculum of the Hotel College at the University of Nevada, Las Vegas. A separate grant to the Nevada Council on Problem Gambling from the Nevada Retail Gaming Association paid for the printing and distribution of approximately 750,000 brochures at gaming and non-gaming locations throughout the state.

Problem gambling prevention efforts in Nevada have been focused on youth and adolescents although families and professionals who work with children have also been targeted. Prevention efforts have included the production and distribution of informational brochures to elementary and secondary school counselors and college students, efforts to include problem gambling questions in substance use and abuse surveys among Nevada youth, and the Nevada Council on Problem Gambling's Project 21® Scholarship Program in which Nevada students are awarded scholarships for their best efforts at raising awareness of the risks and consequences of underage gambling.

The Nevada Council on Problem Gambling has operated a 24-hour, confidential helpline service since 1997. The Problem Gamblers HelpLine utilizes a crisis intervention model and is staffed by specialists with expertise in both problem gambling and crisis intervention. HelpLine specialists refer callers to appropriate resources in their geographic area, including treatment, support groups and ancillary community services. In areas of the state where no specialist treatment is available, referrals are made to a general mental health provider. In 2000, the Problem Gamblers HelpLine in Nevada responded to a total of 1,436 callers seeking help for their own or someone else's gambling problem. The HelpLine responded to an additional 1,441 callers requesting general information about problem gambling issues, programs and services in Nevada.

The Nevada Council on Problem Gambling provides training on problem gambling issues to health care professionals in Nevada. Clinical training provided by the Council meets standards set by the National Gambling Counselor Certification Board. In 2000, the Nevada Council provided 30 hours of problem gambling training to approximately 140 service providers in Nevada from state agencies and state-funded programs as well as in private practice. The Nevada Council on Problem Gambling also maintains a directory of providers in the state with demonstrated knowledge and experience in the

[1] This section is based on remarks made by Carol O'Hare, Executive Director of the Nevada Council on Problem Gambling, before the Nevada Senate Judiciary Committee on March 15, 2001.

treatment of pathological gambling. In March, 2001, there were twelve providers in Nevada who met these criteria and had requested inclusion in the Council's directory.

To date, the Nevada gaming industry has been the primary contributor of financial support for problem gambling services in Nevada. The gaming industry is also the largest consumer of the public awareness materials and employee training programs offered by the Nevada Council on Problem Gambling.

METHODS

The survey of gambling and problem gambling in Nevada was completed in three stages. In the first stage of the project, staff at Gemini Research consulted with the Nevada Department of Human Resources and the Office of the Governor as well as the Cannon Center for Survey Research (CCSR) at the University of Nevada Las Vegas, the organization responsible for data collection, regarding the final design of the questionnaire and the sample design. In the second stage of the project, staff from CCSR programmed the questionnaire and completed telephone interviews with a sample of 2,217 residents of Nevada aged 18 years and older. Interviews were carried out between October 20, 2000 and March 12, 2001. CCSR then provided Gemini Research with the data for the third stage of the project, which included analysis of the data and preparation of this report.

Questionnaire

All respondents were administered a brief screening interview to determine their level of gambling involvement. Approximately one in four respondents who gambled but not on a regular basis were administered the full interview, as were all respondents who gambled once a week or more often.[2] The average administration time for the screener was 7 minutes and the average administration time for the full interview was 26 minutes. A copy of the questionnaire is available from Gemini Research.

Screener. All respondents were screened to obtain information about their involvement in eleven different gambling activities as well as demographic characteristics. For each gambling activity, respondents were asked whether they had ever participated in this activity and whether they had done so in the past year. For each activity they had done in the past year, respondents were asked whether they participated daily, 1 to 3 times a week, 1 or 2 times a month, a few days all year or only one day in the past year. Respondents who acknowledged no gambling at all were asked several questions about why they did not gamble before the interview was terminated.

Full Interview. The full interview included sections on gambling participation, problem gambling, alcohol and drug use, experience of psychiatric disorders (major depression and manic episodes) and help-seeking. As noted above, the majority of problem gambling prevalence surveys carried out in the United States have used the South Oaks Gambling Screen (SOGS) to assess problem and pathological gambling. The version of the SOGS used in Nevada assessed only current (past year) prevalence of problem gambling. Similar versions of the SOGS, assessing only current prevalence, have been used in Minnesota as well as in the national surveys in Australia and Great Britain (Emerson & Laundergan, 1996; Productivity Commission, 1999; Sproston, Erens & Orford, 2000).

Researchers in the field of gambling studies recommend using more than one measure of problem gambling in surveys of the general population (Abbott & Volberg, 1999b; Gambino, 1999; Shaffer, Hall & Vander Bilt, 1997). Indeed, Shaffer and his colleagues argue that the use of multiple problem gambling screens should be one measure of the quality of problem gambling prevalence studies. As noted above (see *Measuring*

[2] Faulty skip rules resulted in full interviews being completed with all respondents who had gambled in the past month or more often. This practice was corrected in January, 2001 after 1,536 respondents had been screened.

Gambling Problems on Page 3), several problem gambling screens based on the most recent psychiatric criteria for pathological gambling have recently been developed. However, only the NODS—developed for the recent U.S. national survey—has been tested for its performance in both clinical and survey populations (Gerstein et al, 1999).

To provide comparability with the largest possible number of surveys, the current version of the SOGS was included in the Nevada questionnaire. The NODS was also included to provide a measure of problem gambling based on the most recent psychiatric criteria. In administering the questionnaire, the two problem gambling screens were rotated so as to avoid an ordering effect.

Translation. Once the questionnaire was finalized, the entire instrument was translated into Spanish by Ms. Bronwyn Nichols, a highly qualified specialist at NORC. Ms. Nichols is certified by the Spanish government with the Diploma Básico Español Lingua Extranjera and had primary responsibility for translation of the questionnaires employed in the recent U.S. national survey of gambling behavior. A separate translation specialist, Ms. Aluisú Schoua-Glusberg, checked the translation done by Ms. Nichols for grammar, sentence construction, comprehension and accuracy. Ms. Schoua-Glusberg also reviewed the translated questionnaire to ensure that the translation utilized terms and expressions appropriate for Spanish speakers of Mexican and South American background, in contrast to Spanish speakers of Puerto Rican or Cuban background.

Survey Design

Since problem and pathological gambling is relatively rare in the general population, problem gambling surveys have typically yielded too few individuals to examine in detail the relationships between problem gambling and other variables, such as gender, age and ethnicity. There are two approaches to obtaining larger numbers of problem and pathological gamblers in a sample. The first approach is to increase the overall sample size dramatically, as was done in the recent national surveys in New Zealand and Sweden (Abbott & Volberg, 2000; Rönnberg et al, 1999). The chief drawback to this approach is the equally dramatic increase in the cost of data collection for these studies.

The second approach is to focus on recruiting individuals into the sample who are at higher-than-usual risk for experiencing gambling problems. This can be done by interviewing individuals at gaming venues or by screening potential respondents by telephone to identify regular gamblers. The first strategy of interviewing patrons was used in the recent U.S. national survey (Gerstein et al, 1999). The second strategy of screening for regular gamblers was adopted in the recent national survey in Australia (Productivity Commission, 1999) as well as in a recent problem gambling survey in North Dakota (Volberg, 2001b). This latter approach was used in the survey in Nevada.

The sample developed for the Nevada survey is known as a “two-phase probability sample” (Kish, 1965) or “double sample” (Cochran, 1963). The first phase involved the selection of 2,217 residential households with telephones in Nevada and the selection of one eligible adult aged 18 or older from each selected household to respond to the screener. The second phase involved a stratified random selection of respondents from the first phase for the full-length interview.

All interviews were conducted at CCSR facilities by trained interviewers with supervision and random monitoring for technique and adherence to procedures. Interviews were

conducted afternoons and evenings on weekdays and weekends. Efforts to complete interviews with selected respondents were extensive. Up to 15 callbacks were made to complete an interview with an eligible respondent.

Challenges to the Project

A number of challenges were encountered in the progress of the adult problem gambling prevalence survey in Nevada. These included:

- a misunderstanding on the part of CCSR regarding the scope of the data collection effort;
- a miscalculation on the part of CCSR regarding the selection of respondents for the full-length interview; and
- extremely slow progress in the data collection effort.

In conducting prevalence surveys throughout the United States and Canada, Gemini Research has made a practice of selecting an in-state survey research organization for data collection. From a research standpoint, in-state survey companies tend to have the best information about the distribution and demographics of the population of the state. In addition, slight variations in speech and pronunciation can give in-state interviewers an edge in successfully completing telephone interviews and contributing to a higher overall response rate. Since data collection costs typically make up one-half or more of the overall budget for prevalence surveys, contracting with an in-state agency ensures that a substantial proportion of the cost of the study is expended within the state.

Scope. The original proposal for this project called for a sample of 5,000 respondents to be briefly screened and for the full interview to be administered to all weekly gamblers as well as one in four less frequent gamblers. During proposal development, Gemini Research identified several survey research organizations in Nevada and solicited a bid from CCSR. Selection of CCSR was based on telephone discussions with all of the eligible organizations that included review of their capabilities, expertise and experience.

Unfortunately, the bid submitted by CCSR was based on a serious misunderstanding of the specifications for the adult survey—namely, the number of completed interviews that were expected. This error was not identified until after CCSR had completed programming the questionnaire, had trained the interviewers, and had started data collection for the adult survey. Although CCSR agreed to provide management and programming from its own budget, the new Director, Dr. Thomas Lamatsch, maintained that due to an unexpectedly high number of weekly gamblers, CCSR would be unable to complete more than 2,400 screening interviews.

Respondent Selection Criteria. The second miscalculation made by CCSR related to the identification and selection of respondents for the full interview. The original proposal called for all weekly gamblers and one of every four less frequent gamblers to complete the full interview. Based on information from the U.S. national gambling survey as well as reports from the Las Vegas Convention and Visitors Authority, Gemini Research estimated that approximately 20% of the screened adult sample in Nevada would be weekly gamblers and that approximately 10% of these weekly gamblers would score as lifetime problem gamblers.

To assess the impact of the reduced sample size on the overall goals of the project, Gemini Research sought information from CCSR in November, 2000, on the proportion of weekly gamblers in the sample of respondents interviewed to date. At that time, CCSR indicated that 32% of the respondents interviewed thus far were weekly gamblers. This rate was substantially higher than projected.

Before finalizing an amendment to the primary contract to reflect the smaller projected sample for the adult survey, Gemini Research sought to verify the information from CCSR regarding the proportion of weekly gamblers in the screened sample. CCSR provided a data set to Gemini Research on December 5, 2000. Our analysis showed that only 19% of the screened respondents were weekly gamblers. This discrepancy was caused by the practice at CCSR of including respondents who gambled once or twice a month in the group of weekly gamblers. Unfortunately, this practice was not clarified by CCSR until January 7, 2001.

After consultation with Dr. Robert Johnson, a sampling and statistical specialist at NORC, we requested that the sampling strategy for the adult survey in Nevada be changed. The full interview was to be administered only to weekly gamblers and all savings achieved by not administering the full interview to less frequent gamblers were to be directed toward increasing the number of screening interviews. Although the original proposal called for administration of the full interview to all weekly gamblers and one in four less frequent gamblers, the proportion of weekly gamblers who were administered the full interview in the final data set was just over 50%.

Adult Data Collection Progress. The final challenge encountered in the Nevada adult prevalence survey relates to the progress of data collection and the completion rate for the survey. Data collection for the adult survey in Nevada began on October 20, 2000. On March 12, 2001, after 20 weeks in the field, CCSR informed Gemini Research that all of the available funds for the project had been expended and that data collection had ceased. Reasons for the slow progress of data collection in Nevada are not clear although data collection efforts were apparently suspended between December 5 and January 7, while CCSR attempted to clarify the respondent selection criteria they were using.

A related issue is the completion rate achieved for the Nevada adult survey. Completion rates for telephone surveys have declined in recent years as a result of changes in telecommunications technology as well as increases in political polling and market research done by telephone. Gemini Research monitored the completion rate for the Nevada adult survey carefully over the entire data collection period. We expressed our concerns about the low completion rate achieved by CCSR several times, both to CCSR management and to DHR. In spite of substantial efforts by CCSR interviewers, the final completion rate for the Nevada adult survey is lower than desirable. For a variety of reasons, detailed below, the achieved sample is of adequate quality for the analyses that follow. In particular, see Page 15 for a discussion of the impact of response rates on problem gambling prevalence estimates.

Sample Disposition and Response Rate

To obtain a representative sample for the Nevada survey, random selection of households and random selection of respondents within households (Kish grid) were used. Geographically, Nevada is divided into three regions (Clark County, the Reno-Washoe-Douglas County region and all other counties). A random sample of 10-digit telephone numbers was purchased for this survey from Survey Sampling, Inc. The list from which the numbers were drawn included only Nevada area codes and telephone banks (that is, blocks of 1,000 consecutive numbers within Nevada).

One consequence of the decline in response rates for telephone surveys mentioned above has been that these rates are now calculated in several different ways. Although all of these approaches involve dividing the number of respondents by the number of contacts believed to be eligible, there are sometimes substantial differences in response rates that result from different ways of calculating the denominator—that is, the number of individuals deemed eligible to respond. The most liberal approach is called the Upper Bound method and takes into account only those individuals who complete the interview, refuse to participate or terminate an interview. This approach is used by the federal government because of controversies about the eligibility of telephone numbers that cannot be reached. A more conservative approach is the method adopted by the Council of American Survey Research Organizations (CASRO). The CASRO approach uses the known status of portions of the sample that are contacted to impute characteristics of portions of the sample that were not reached.

Table 3 presents information about the final disposition of the Nevada adult sample. Overall, CCSR called 16,071 numbers to determine whether each was a working residential number in contrast to a non-working number, a commercial/business line, a cell phone, data or fax line, or a non-primary household telephone. CCSR classified 12,367 of these numbers as working residential numbers (WRNs) eligible for interview.

Table 3: Disposition of Nevada Adult Sample

			% / Total	% /TQS
Total Qualified Sample				
	1.Completes	2217	13.8	24.4
	2.Refusals (soft, hard, partial)	2372	14.8	26.1
	3.Callbacks	1402	8.7	15.4
	4.Answering machine / Left message	3091	19.2	34.0
	Total TQS	**9082**	56.5	**100.0**
Status Not Determined		**3285**	20.4	
Total Out of Sample				
	5.Fax / Modem	704	4.4	
	6.Business	765	4.8	
	7.Cell phone	42	0.3	
	8.Disconnected	1968	12.2	
	9.Not Qualified / Ineligible	225	1.4	
	Total OOS	**3704**	23.0	
Total Numbers		**16,071**	**100.0**	

There are at least two reasons to question the status of the proportion of numbers classified as WRNs. First, in geographic areas with rapid increases in population, such as Nevada, telephone companies rapidly increase the number of area codes and new exchanges that are available. This means that the telephone banks purchased for the Nevada survey likely contained fewer active residential numbers than similar banks from other states with lower rates of population growth (Peda, email communication, November 29, 2000). Second, it is common in such markets for telephone companies to connect telephone lines immediately into apartments and residences rather than waiting until service is established by a paying customer. This practice means that a significant proportion of a sample of such numbers will ring even though the line is not actually connected (Lamatsch, email communication, January 16, 2001).

The Upper Bound method of calculating the response rate for the Nevada survey entails dividing the number of completes by the sum of completes plus refusals.[3] The Upper Bound method yields a response rate of 48% for the Nevada survey. The CASRO method yields a response rate of 24% for the Nevada survey, if all of the numbers whose status could not be determined are excluded from the denominator. Even if a large proportion of these numbers is assumed to represent eligible households, the CASRO response rate for the Nevada survey changes very little.

What is the Impact of the Response Rate?

There is great uncertainty about the characteristics of individuals who choose not to participate in gambling surveys. It has generally been assumed that people who are not contacted or who decline to be interviewed in gambling surveys include disproportionate numbers of problem gamblers (Lesieur, 1994). Alternatively, it has been suggested that both people with little involvement or interest in gambling and problem gamblers may be over-represented among respondents in surveys with low to medium response rates. If this is the case, the effects of their omission may partially or totally cancel each other out (Abbott & Volberg, 1999a).

The results of recent national surveys in New Zealand and Sweden shed light on this issue (Abbott, Volberg & Rönnberg, 2001). In both of these surveys, data collection was carried out by official government statistics agencies and high response rates were achieved (76% and 72%, respectively). In spite of unprecedented measures taken to contact and interview selected respondents in these surveys, estimates of the prevalence of problem gambling in both countries were low relative to recent surveys in North America and Australia.

In attaining their high response rates, it is possible that the national surveys in New Zealand and Sweden picked up disproportionate numbers of people with low gambling involvement. To assess the impact of variations in response rates on problem gambling prevalence estimates, Abbott (2001) compared the results of the New Zealand study with the results of a recent national Australian survey that used a similar problem gambling screen (Productivity Commission, 1999). Like many of the gambling surveys carried out in North America, the Australian study achieved a relatively low response rate, one quite similar to the response rate obtained in Nevada.

[3] The Upper Bound response rate is calculated as follows: Completes / (Completes + Refusals) = 2217 / (2217 + 2372) = 2217 / 4589 = .48 (48%).

Abbott (2001) found that the New Zealand problem gambling prevalence estimate was very similar to prevalence estimates obtained for the two Australian states that had similar per capita gambling expenditures. The New Zealand prevalence estimate was markedly lower than estimates from Australian states and territories with higher per capita expenditures. This comparison provides further support for the contention that problem gambling is a "robust and reliable phenomenon" largely impervious to differences in researcher and research methodology and quality (Shaffer, Hall & Vander Bilt, 1997: 61). It also suggests that the relatively low response rate achieved in the Nevada survey likely had little impact on the estimate of problem gambling prevalence in the state.

Characteristics of the Achieved Sample

Like the response rate, information about the characteristics of a sample is useful in assessing the validity and reliability of the results of a survey. While a fully random design is the most desirable approach to obtaining a representative sample of the population, this approach often results in under-sampling demographic groups with low rates of telephone ownership. These groups most often include young adults, minorities and individuals with low education and income. To determine how well the sample represents the total population, it is helpful to examine how closely the achieved sample matches the known demographic characteristics of the population.

To determine whether the Nevada adult sample was representative of the Nevada population, the demographics of the sample were compared with the most recent information from the United States Bureau of the Census (U.S. Bureau of the Census, 2001). Table 4 shows key demographic characteristics of the achieved sample in Nevada compared with the 2000 Census.

Table 4: Comparing the Achieved Sample to the General Population

		Achieved Sample %	2000 Population %
Gender			
	Male	43.6	50.8
	Female	56.4	49.2
Age			
	18 – 24	9.6	12.1
	25 – 44	41.9	42.3
	45 – 64	32.9	30.9
	65 +	15.6	14.7
Ethnicity			
	White	70.8	65.2
	Black	5.2	6.8
	Hispanic	16.2	19.7
	Other	7.8	8.3

Table 4 demonstrates that the achieved sample was in fact quite representative of the adult population in Nevada, as determined by the Bureau of the Census. The greatest differences between the two samples were in the proportion of men and Whites included in the final sample. The achieved sample was highly representative of the population in terms of age.

Weighting and Imputation

Due to the complex sampling strategy, the data from the Nevada survey were weighted to ensure that the results of the survey could be generalized to the adult population of Nevada. Assistance in weighting the Nevada sample was provided by Dr. Robert Johnson, a senior statistician working at the National Opinion Research Center (see Appendix B for a detailed discussion of the weighting and imputation procedures).

The two-phase sample used in the Nevada survey required the construction of two sets of weights. The first set of weights (WTSHORT) treated the selection process for Phase One as an equal-probability selection of eligible adults in Nevada. The second set of weights (WTLONG) adjusted for both the differential probabilities of selection for the full interview based on gambling frequency, for differential non-response by region, age, and gender at Phase One and Phase Two, and for differential non-response by gambling frequency at Phase Two. WTSHORT was used in all analyses of data from the screener. WTLONG was used in all analyses of data from the full interview. Since each weight was scaled to sum to the total number of respondents, the weights yield fairly accurate standard errors for analytical statistics and confidence intervals for estimated parameters.

Exceptions were the calculation of point estimates for problem gambling prevalence for the Nevada population as a whole and the calculation of confidence intervals for problem gambling prevalence estimates in specific sub-groups in the population. In determining point estimates of the prevalence of problem gambling for the entire sample, prevalence rates were first calculated for respondents who completed the full interview using WTLONG. These estimates were then multiplied by an adjustment factor obtained by dividing the number of respondents who ever gambled by the total number of respondents in the sample. Additionally, standard errors for problem gambling prevalence among sub-groups in the population were adjusted by a factor of 1.05 (the square root of the coefficient of variation in WTLONG) to account for unequal weights due to unequal probabilities of sample selection and differential non-response.

Statistical Analysis

Given the problems experienced by CCSR in correctly carrying out the specifications of the data collection effort, all of the data, and particularly the items from the two problem gambling screens, were checked carefully for correct skip procedures. In several instances, individual responses to items were corrected to reflect the original logic of the questionnaire.

The data were analyzed using Statistical Package for the Social Sciences, Version 10.0 (SPSS 10.0). Numerous analytic variables were constructed from the raw data, including generalized gambling participation levels, scores on the two problem gambling screens, levels of alcohol and drug use, experience of manic episodes and major depression, and help-seeking for mental health problems, alcohol or drug abuse and gambling problems. For the most part, chi-square analysis and analyses of variance were used to test for statistical significance.

GAMBLING IN NEVADA

This chapter examines gambling participation in the general population in Nevada. To assess the full range of gambling activities available to Nevada residents, the instrument for the survey included questions about ten different wagering activities. All respondents were asked if they had ever gambled or bet money on the following activities:

- casino games
- horse or dog races at a racetrack or an off-track betting parlor
- lottery games
- bingo in a bingo hall
- charitable games
- card games in a cardroom
- private games, such as dice, dominoes, poker, pool, golf or bowling
- slot machines, video poker or pull tabs at a store, bar, restaurant or similar location
- unlicensed games, including sports pools, numbers and bets with a bookmaker
- Internet

Gambling in the General Population

In every recent survey of gambling and problem gambling, the majority of respondents acknowledge participating in one or more gambling activities. Nationally, the proportion of the population that has ever gambled ranges from 81% in the Southern states to 89% in the Northeast (Gerstein et al, 1999). In 2000, 86% of the Nevada respondents acknowledged participating in one or more of the ten activities included in the questionnaire.

Table 5 on the following page shows lifetime, past year, monthly and weekly participation for all of the types of gambling included in the Nevada adult survey. Lifetime participation among Nevada respondents is highest for casino gambling, lottery, and gaming machines at stores, bars, restaurants or similar locations. Between 40% and 80% of the respondents acknowledge having ever participated in these activities. About one-fifth of the respondents have ever wagered on pari-mutuel events, private games of skill and bingo in a bingo hall. Lifetime participation rates are below 10% for all of the other types of gambling included in the survey.

Table 5: Lifetime, Past Year and Weekly Gambling Participation

	Lifetime Participation (2217) %	Past Year Participation (2217) %	Monthly Participation (2217) %	Weekly Participation (2217) %
Casino	79.0	57.8	31.9	13.1
Lottery	43.5	20.1	6.1	2.3
Gaming machines (non-casino)	40.0	29.5	14.0	5.3
Horse or dog racing	23.9	3.9	0.8	0.5
Private	19.4	8.9	3.6	1.4
Bingo in bingo hall	18.2	5.8	2.3	1.2
Charitable	9.1	3.8	0.6	0.1
Unlicensed	7.9	3.0	0.8	0.5
Cardroom	6.0	2.9	1.3	0.7
Internet	1.5	1.4	0.9	0.5
Total	85.6	67.9	28.1	19.0

It is interesting to compare gambling participation rates in Nevada with participation rates for the nation as a whole. This comparison is possible because the Nevada survey used the same definitions for different gambling activities as the national survey (Gerstein et al, 1999). Figure 1 presents information about past year gambling participation rates in the United States in 1998 and Nevada in 2000.

Figure 1: Comparing Gambling Participation in US and Nevada

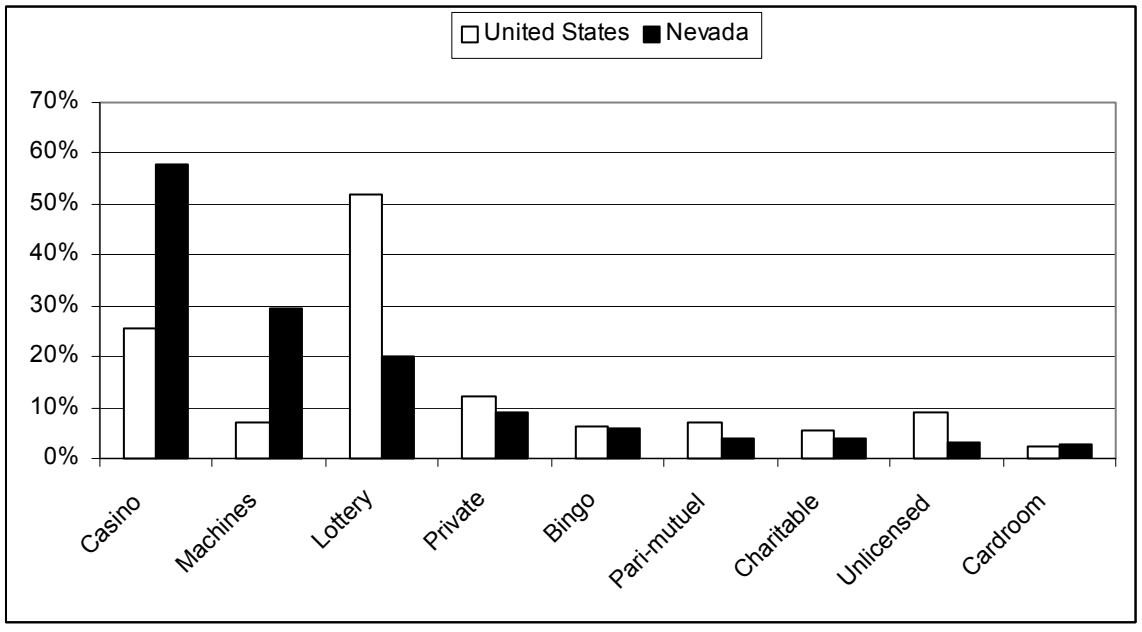


Figure 1 shows that past year casino gambling and non-casino machine gambling are much higher in Nevada than in the United States generally; the reverse is true for lottery play. With the exception of casinos and gaming machines, past year participation in most gambling activities is slightly lower in Nevada than in the United States generally. This is reminiscent of the national survey in 1975, which found that that there was less illegal and private gambling in Nevada than in the nation as a whole (Kallick et al, 1976).

Patterns of Gambling Participation

Gambling participation is not distributed evenly throughout the population. To understand patterns of gambling participation, it is helpful to examine the demographic characteristics of respondents who wager at increasing frequency. To analyze levels of gambling participation, we divided respondents into four groups:

- ***non-gamblers*** who have never participated in any type of gambling (14% of the total sample);
- ***infrequent gamblers*** who have participated in one or more types of gambling but not in the past year (17% of the total sample);
- ***past year gamblers*** who have participated in one or more types of gambling in the past year but not on a regular basis (29% of the total sample);
- ***monthly gamblers*** who participate in one or more types of gambling once a month or more often (21% of the total sample); and
- ***weekly gamblers*** who participate in one or more types of gambling on a weekly basis (19% of the total sample).

Table 6 shows that there are numerous significant differences in the demographic characteristics of non-gamblers, infrequent gamblers, past-year gamblers, monthly gamblers and weekly gamblers in Nevada as well as differences in the mean number of gambling activities these groups have ever tried.

Table 6: Demographics of Gamblers in Nevada

		Non-Gamblers %	Infrequent Gamblers %	Past Year Gamblers %	Monthly Gamblers	Weekly Gamblers %
		(319)	(388)	(636)	(454)	(420)
		(306)	(386)	(627)	(445)	(403)
Gender***	Male	44.1	41.2	46.3	59.1	63.0
	Female	55.9	58.8	53.7	40.9	37.0
		(301)	(377)	(619)	(437)	(394)
Age***	18 – 24	17.6	9.3	12.6	11.7	8.9
	25 – 34	29.6	16.4	23.1	20.1	17.3
	35 – 44	17.3	21.8	25.7	22.7	14.0
	45 – 54	13.3	20.4	19.7	16.0	16.5
	55 – 64	9.3	13.8	12.3	14.0	18.5
	65 +	13.0	18.3	6.6	15.6	24.9
		(305)	(385)	(625)	(443)	(404)
Ethnicity***	White	48.9	75.1	77.0	70.2	68.3
	Black	6.2	4.7	4.3	5.4	5.7
	Hispanic	38.4	12.5	11.2	16.3	16.1
	Other	6.6	7.8	7.5	8.1	9.9

Pearson Chi-Square * p≤.05 ** p≤.01 *** p≤.001

Table 6 (cont'd): Demographics of Gamblers in Nevada

		Non-Gamblers %	Infrequent Gamblers %	Past Year Gamblers %	Monthly Gamblers	Weekly Gamblers %
		(304)	(384)	(618)	(443)	(398)
Marital Status***	Married	56.6	56.8	56.0	55.5	50.8
	Widowed	6.9	9.9	4.2	6.3	10.8
	Divorced/Separated	12.2	19.3	18.1	18.3	19.3
	Never Married	24.3	14.1	21.7	19.9	19.1
		(303)	(386)	(622)	(445)	(400)
Education***	Elementary/Some HS	25.4	8.3	6.3	10.3	11.8
	HS Grad	30.0	26.2	26.5	31.9	32.8
	Some College	28.7	42.2	44.4	37.1	33.0
	BA Degree	11.6	14.2	14.8	13.5	18.3
	Graduate Study	4.3	9.1	8.0	7.2	4.3
		(300)	(387)	(622)	(442)	(400)
Employment***	Working Full Time	49.3	51.7	64.8	56.8	49.3
	Working Part Time	12.3	9.3	8.7	11.1	7.3
	Keeping House/Student	21.0	14.5	13.5	8.8	9.3
	Retired /Disabled	15.0	23.3	10.9	20.1	30.5
	Unemployed	2.3	1.3	2.1	3.2	3.8
		(184)	(294)	(487)	(359)	(317)
Income***	Up to $15,000	11.4	10.9	4.9	6.7	8.5
	$15,000 -- $24,999	16.3	9.5	8.2	10.0	12.9
	$25,000 -- $34,999	22.3	16.0	12.7	15.9	16.7
	$35,000 -- $49,999	19.6	18.0	19.7	21.4	18.6
	$50,000 -- $99,999	21.2	32.0	42.3	34.8	33.4
	$100,000 and higher	9.2	13.6	12.1	11.1	9.8
Mean Lifetime Gambling Activities***		---	1.99	2.87	3.36	3.87

Pearson Chi-Square * p≤.05 ** p≤.01 *** p≤.001

Table 6 shows that infrequent gamblers and non-gamblers in Nevada are most likely to be female, under the age of 35, Hispanic and to have annual household incomes under $35,000. Monthly and weekly gamblers in Nevada are most likely to be male, over the age of 55, White and to have annual household incomes over $35,000. Table 6 also shows that the average number of gambling activities ever tried increases significantly with the frequency of a respondent's current gambling.

It is worth noting that there are significant differences in the distribution of gambling involvement across the three regions of the state. One-fifth (20%) of the respondents from Clark County gamble weekly compared to 15% of respondents from elsewhere in the state. While respondents from outside Clark County are less likely to gamble weekly, they are more likely to gamble overall. Only 12% of the respondents from the Reno/Sparks/Carson City region and 9% of the respondents from outside the two major metropolitan areas acknowledged never having tried any gambling activities included in the questionnaire compared to 16% of the respondents from Clark County (Pearson chi-square = 20.67, df=4, p=.000).

The distribution of gambling participation within the population in Nevada is rather distinct. In contrast to some other U.S. jurisdictions, young, minority women in Nevada are the least likely to gamble while older White men are the most likely to gamble on a regular basis. This bi-modal distribution of gambling participation—with men gambling regularly and women far less frequently, if at all— has been identified within minority populations in New Zealand and Sweden (Abbott & Volberg, 2000; Rönnberg et al, 1999). A similar, bi-modal distribution of gambling participation was identified in the Northwest region of North Dakota (Volberg, 2001b). While the causes and consequences of this pattern of gambling participation are not entirely clear, it is nevertheless distinctive and worthy of further investigation.

Gender, Age, Ethnicity and Gambling in Nevada

The results of numerous gambling surveys have shown that gender, age and ethnicity are the strongest demographic predictors of gambling in general as well as of participation in specific types of gambling. The results of the U.S. national survey demonstrate that interactions between these demographic characteristics affect gambling participation (Gerstein et al, 1999; Volberg, Toce & Gerstein, 1999). The distinct pattern of gambling participation in Nevada makes it important to explore further the relationship between demographic characteristics and gambling participation.

Table 7 presents rates of lifetime, past year, monthly and weekly gambling in the Nevada sample as a whole as well as by gender and ethnicity. Table 7 shows that, among Whites and Hispanics, men are more likely than women to have ever gambled, to have gambled in the past year, and to gamble on a regular basis. Among African Americans, while women are more likely to have ever gambled, men are more likely to have gambled in the past year and to gamble on a regular basis. Among "Other" respondents, the only clear difference is that women are less likely to gamble weekly than men.

Table 7: Gambling Participation by Gender and Ethnicity

	Group Size	Ever	Past Year	Monthly	Weekly
Total	2153	85.8	67.9	28.1	18.6
White		**	***	***	***
Male	741	91.9	76.9	34.8	22.9
Female	758	88.1	64.9	21.2	13.7
Black				*	
Male	55	78.2	68.5	41.8	21.8
Female	56	87.5	63.6	25.0	17.9
Hispanic		**	**	**	**
Male	201	73.6	62.2	32.8	21.9
Female	169	62.1	47.1	19.4	11.8
Other					
Male	96	87.5	69.8	28.4	25.0
Female	77	88.3	72.4	28.9	19.7

Pearson Chi-Square * p≤.05 ** p≤.01 *** p≤.001
Level of significance indicated above gender comparison for each ethnic group.

Differences in the pattern of gambling participation become even clearer when we examine participation by gender and ethnicity in specific types of gambling. Table 8 on the following page presents differences in monthly participation in the top four gambling

activities in Nevada. Monthly data were selected because of the significant differences identified between men and women in each of the different ethnic groups.

Table 8: Monthly Participation Rates by Gender and Ethnicity

	Casino	Machines	Lottery	Private
White	***	***	***	***
Male	39.4	17.7	8.8	6.2
Female	24.5	9.1	4.7	0.9
Black		*		
Male	38.2	23.6	9.1	7.3
Female	28.6	8.9	3.6	1.8
Hispanic	***	*		
Male	36.3	17.9	4.0	4.0
Female	17.8	10.1	5.3	2.9
Other				
Male	36.5	23.2	4.2	5.2
Female	29.9	13.0	6.5	3.9

Pearson Chi-Square * p≤.05 ** p≤.01 *** p≤.001
Level of significance indicated above gender comparison for each ethnic group.

Table 8 shows that White men are significantly more likely than White women to gamble monthly or more often at a casino, on non-casino gaming machines, on the lottery and privately. Like White men, Black men are more likely than Black women to gamble monthly or more often on all of these activities. However, the number of Black respondents in the sample is too small for most of these differences to achieve statistical significance. Like White men, Hispanic men are significantly more likely than Hispanic women to gamble monthly or more often at a casino, on non-casino gaming machines and privately. However, Hispanic women are just as likely as Hispanic men to gamble monthly or more often on the lottery. The pattern of monthly or more frequent gambling among "Other" respondents is most similar to the pattern among Hispanic respondents.

Given the distinct distribution of gambling participation in the Nevada population, with young, minority women on one end of the continuum and older White men at the other end, it is important to also examine differences in gambling participation by age. Table 9 presents monthly participation rates for the top four gambling activities in Nevada among younger and older, White, Black, Hispanic and Other men and women. While small cell sizes mean that caution is needed in interpreting these results, the analysis is nonetheless interesting.

Table 9: Monthly Participation Rates by Age, Gender and Ethnicity

	Casino		Machines	
	< 35	35+	< 35	35+
White	***	***	***	**
Male	40.3	38.8	22.0	15.6
Female	15.1	28.0	8.0	9.7
Black				
Male	25.0	50.0	20.8	20.7
Female	18.8	31.6	6.3	10.5
Hispanic	***	*		*
Male	32.2	42.9	15.7	20.0
Female	11.3	27.5	11.3	7.2
Other				
Male	37.9	35.9	27.6	21.5
Female	22.2	34.8	14.3	13.0

Table 9 (cont'd): Monthly Participation Rates by Age, Gender and Ethnicity

	Lottery		Private	
	< 35	35+	< 35	35+
White	**		***	***
Male	7.3	8.9	6.8	5.6
Female	1.5	5.9	0.5	1.1
Black				
Male	4.2	6.9	16.7	---
Female	6.3	2.6	6.3	---
Hispanic				
Male	2.6	6.0	5.2	1.2
Female	3.1	8.7	2.1	2.9
Other				
Male	10.3	1.6	3.6	6.2
Female	10.7	4.3	3.6	2.2

Pearson Chi-Square * p≤.05 ** p≤.01 *** p≤.001
Level of significance indicated above gender comparison for each ethnic group.

Table 9 shows that, while White men are significantly more likely than White women in Nevada to gamble monthly or more often at casinos, the difference is much greater among younger than among older White respondents. In contrast, older Black and Hispanic men as well as older Black, Hispanic and "Other" women are substantially more likely than their younger counterparts to gamble monthly or more often at a casino. Like White men, older "Other" men are just as likely as their younger counterparts to gamble monthly at a casino.

Monthly gambling on non-casino gaming machines is rather different from casino gambling. Table 9 shows that older White and "Other" men are somewhat less likely than their younger counterparts to gamble on non-casino machines on a monthly basis. Older Hispanic men are somewhat more likely to gamble monthly on non-casino machines than their younger counterparts. There is no difference in monthly non-casino machine gambling by age among Black men and among White and "Other" women. Monthly non-casino machine gambling is somewhat higher among older Black women and somewhat lower among Hispanic women than among their younger counterparts.

Again, lottery play has a distinct pattern of participation by gender, age and ethnicity, with older White and Hispanic women as well as older Hispanic men more likely to play the lottery on a monthly basis than their younger counterparts. In contrast, older Black and "Other" women as well as "Other" men are less likely to play the lottery on a monthly basis than their younger counterparts. Finally, while men generally are more likely than women to gamble privately on a monthly basis, younger Black and Hispanic men are more likely than their older counterparts to gamble privately on a regular basis.

Numerous studies have found that older Americans are less likely than younger Americans to gamble and, when they do gamble, to be involved in only a few activities (Gerstein et al, 1999; Kallick et al, 1976; Mok & Hraba 1993). The data presented in Table 6 and Table 9 suggest that, in fully mature gambling markets such as Nevada, older adults (and older minority adults in particular) are actually more likely to gamble than younger adults. These findings suggest that there may be factors apart from age that contribute to gambling participation in different demographic groups in the population.

Gambling Preferences[4]

For several types of gambling, respondents in Nevada who acknowledged participation in the past year and who completed the full interview were asked about their preferences for particular games. These types of gambling included casinos, non-casino gaming machines, the lottery, private gambling, bingo, and cardrooms.

Casino. Respondents who acknowledged gambling at a casino once a month or more in the past year (N=355) were asked what casino game they preferred to play. Half of these respondents (50%) indicated that they usually played slot machines, including video poker, when they went to a casino. Nearly one-third (30%) of these respondents indicated that they usually played card games, including blackjack and poker, when they went to a casino and another 5% indicated that they usually played table games such as craps or roulette. Only 5% of these respondents said that they usually gambled on sports or racing events when they went to a casino and 6% indicated that they usually played bingo or some type of keno game.

Respondents who gambled at a casino once a month or more often were also asked whether they usually spent most of their time on one gambling activity. Just over three-quarters of these respondents (78%) indicated that they usually spent most of their time on one gambling activity. Finally, respondents who gambled at a casino once a month or more often were asked how long they usually gambled when they went to a casino. Again, three-quarters of these respondents (75%) indicated that they spent 2 hours or less gambling when they went to a casino. Another 22% of these respondents indicated that they spent between 3 and 5 hours gambling when they went to a casino and only 3% of these respondents said that they spent 6 or more hours gambling when they went to a casino.

Non-Casino Gaming Machines. Respondents who acknowledged gambling at a store, bar, restaurant or similar location once a month or more in the past year (N=167) were asked where they usually played, what game they preferred to play, and how long they usually played. Over half of these respondents (54%) indicated that they usually gambled at a grocery store, convenience store, gas station or laundromat. Another 39% of these respondents said that they usually gambled at a bar, tavern, restaurant or lounge. Nearly three-fifths of these respondents (58%) indicated that they usually played slot machines when they gambled at a store, bar, restaurant or similar location and another 35% indicated that they usually played some other kind of electronic game, such as video poker. The majority of these respondents (72%) said that they played for less than an hour when they gambled at a store, bar, restaurant or similar location and another 21% of these respondents said that they usually played for 1 to 2 hours.

Lottery. Respondents who acknowledged playing the lottery once a month or more in the past year (N=65) were asked which lottery game they preferred, where they usually went to purchase tickets, and how far they usually traveled from home to play the lottery. Three-fifths of these respondents (63%) indicated that they usually purchased large-jackpot tickets or multi-state lottery tickets, which can also generate extremely large jackpots. Another 18% of these respondents said that they preferred to play the daily numbers games and only 10% said that they liked to play the instant or scratch-off

[4] WTLONG was used for analyses of gambling preferences because questions about the specifics of gambling participation were only asked of respondents who completed the full interview.

lottery games. The remaining 10% of these respondents did not express a preference for one or another lottery game.

The majority of the respondents who played the lottery once a month or more often (79%) indicated that they usually purchased lottery tickets in one of the states contiguous to Nevada, including California, Oregon, Idaho and Arizona. One-third of the respondents who played the lottery once a month or more often (33%) said that they usually traveled less than 10 miles in order to play the lottery and another 31% of these respondents indicated that they usually traveled between 10 and 50 miles to play the lottery.

Private Gambling. Respondents who had gambled on a private game once a month or more in the past year (N=42) were asked where they usually played such games and how long they usually played. Two-thirds of these respondents (66%) indicated that they usually gambled on private games at their own or someone else's home. A small proportion of these respondents (14%) said that they usually gambled on private games at a bar or lounge. The remaining respondents refused to answer this question. The majority of these respondents (91%) indicated that they usually spent between 1 and 5 hours gambling on private games.

Bingo. Only 22 respondents acknowledged playing bingo once a month or more in the past year. The majority of these respondents (61%) said that they usually played bingo at a commercial bingo hall and another 28% of these respondents said that they usually played bingo at a charitable bingo hall. The remaining respondents were unable to specify where they usually played bingo. All but three of the respondents who played bingo once a month or more often said that they usually played for less than 3 hours.

Cardroom. As with bingo, only a small number of respondents (N=15) acknowledged gambling at a cardroom once a month or more in the past year. Four of these respondents indicated that they usually went to commercial cardrooms in Las Vegas and the remaining respondents said that they usually went to commercial cardrooms in California or Washington State. Three-quarters of these respondents (77%) indicated that they usually spent between 1 and 5 hours gambling when they went to a cardroom.

Reasons for Gambling

Another important question in gambling studies is why people choose to gamble. In the Nevada adult survey, respondents in the full interview were asked why they generally gambled, with respondents rating whether any of several different reasons was "very important," "important," "not so important," or "not at all important." Table 10 on the following page presents information on the proportion of respondents who indicated that each of these reasons was "important" or "very important."

Table 10: Reasons for Gambling

	Entertainment or fun	To win money	To socialize	Excitement or challenge
Total	71.7	66.7	36.8	35.1
Male	74.7	67.1	37.0	38.1
Female	66.7	65.7	36.0	29.7
18 – 34	69.4	68.0	40.0	39.2
35 and over	72.7	65.9	35.3	33.2
White	74.5	64.1	42.9	36.6
Black	41.2	88.2	17.6	35.3
Hispanic	70.3	64.0	23.9	27.0
Other	69.7	82.4	27.3	40.6

Table 10 shows that men in Nevada are more likely than women to gamble for entertainment or for excitement. Younger adults in Nevada are more likely than older adults to gamble in order to socialize or for excitement. In contrast, older adults are more likely than younger adults to gamble for entertainment.

The clearest differences are in the reasons that respondents from different ethnic groups give for gambling. Black respondents are the least likely to say they gamble to socialize or for entertainment while White and Hispanic respondents are most likely to say that entertainment is an important reason why they gamble. Black respondents are the most likely to say they gamble in order to win money. There are also ethnic differences in reasons that non-gamblers give for not gambling: 31% of Hispanic non-gamblers versus 44% of White non-gamblers and 47% of Black non-gamblers refrained from gambling for moral reasons. In contrast, 69% of White non-gamblers and 71% of Black non-gamblers—but only 44% of Hispanic non-gamblers—refrained for financial reasons. Together, these data suggest that Hispanics tend to approach gambling more as a social activity while Blacks view gambling more as a financial proposition.

PROBLEM GAMBLING IN NEVADA

The majority of problem gambling prevalence surveys carried out in the United States have used one or another version of the South Oaks Gambling Screen (SOGS) to assess problem and pathological gambling (Shaffer, Hall & Vander Bilt, 1997). To provide comparability with the large number of surveys based on the SOGS, the Nevada survey included the current (past year) version of the SOGS. To provide a measure of problem gambling in Nevada based on the most recent psychiatric criteria, the NORC DSM Screen for Gambling Problems (NODS) was also included in the survey (Gerstein et al, 1999).

Research on the performance of the SOGS has shown that the lifetime screen is very good at detecting pathological gambling among those who currently experience the disorder (see Appendix A for a discussion of the performance of both the SOGS and the NODS). However, as expected, the screen identifies at-risk individuals at the expense of generating a substantial number of false positives. The current SOGS produces fewer false positives than the lifetime measure but more false negatives and thus provides a weaker screen for identifying pathological gamblers in the clinical sense. However, the greater efficiency of the current SOGS makes it a more accurate tool for identifying problem gambling prevalence rates as well as a more useful tool for detecting rates of change in the prevalence of problem and pathological gambling over time. As with the SOGS, a field test of the NODS prior to the national survey showed that the lifetime version of the screen did better than the past year version at identifying clinically confirmed pathological gamblers (Gerstein et al, 1999).

Pathological gambling is defined by the psychiatric profession as a chronic or chronically relapsing mental disorder (American Psychiatric Association, 1994). Once fully developed, chronic disorders leave a lifelong vulnerability. This vulnerability may be effectively treated and kept in check. However, periods when an individual is relatively free of symptoms do not mean that the person is free of the disorder. In this section of the report, the current SOGS is used as the primary measure of the prevalence of problem and probable pathological gambling in the adult Nevada population. In the next section of the report, the lifetime NODS will be used as the primary measure to describe the clinically relevant characteristics of problem and pathological gamblers in Nevada. This approach is based on our assessment of the performance of both screens across a range of studies.

Prevalence Rates

Prevalence rates are based on the proportion of respondents in a sample who score on increasing numbers of items that make up one or another of the accepted problem gambling screens. As noted above (see *Measuring Gambling Problems* on Page 3), individuals are classified in prevalence surveys as problem gamblers or probable pathological gamblers on the basis of their responses to a previously established number of items included in one or more of these problem gambling screens.

Table 11 presents information about the proportion of the total sample (N=2217) who score on an increasing number of items on the current SOGS.[5] Individuals scoring 10 or more points on the current SOGS have been grouped together because of the small number of respondents at these higher levels. Table 11 also summarizes the prevalence of problem and probable pathological gambling based on established criteria for discriminating between respondents without gambling-related difficulties and those with moderate to severe problems (Abbott & Volberg, 1996; Lesieur & Blume, 1987).

Table 11: Scores on Current SOGS

Number of SOGS Items	Past Year
	(2217)
Non-Gamblers	14.4
0	64.9
1	9.7
2	4.6
Non Problem Gamblers	79.2
3	1.9
4	1.1
Problem	2.9
5	1.4
6	0.9
7	0.1
8	0.5
9	0.1
10+	0.5
Probable Pathological	3.5
Combined Problem/ProbPath	6.4

According to the most recent census of the population (U.S. Bureau of the Census, 2001), the population of Nevada aged 18 and over in 2000 was 1,486,458. Based on these figures, we estimate that between 32,700 (2.2%) and 53,500 (3.6%) Nevada residents aged 18 and over can be classified as current problem gamblers. In addition, we estimate that between 40,100 (2.7%) and 63,900 (4.3%) Nevada residents aged 18 and over can be classified as current probable pathological gamblers.

Prevalence Among Demographic Groups

As in other jurisdictions, problem gambling prevalence rates are significantly different among sub-groups in the population in Nevada. Because the confidence intervals around prevalence estimates for many of these sub-groups are large, most of the comparisons between these groups must be interpreted with caution. In presenting these data, we have suppressed all estimates where the confidence interval for any cell equals or exceeds the prevalence estimate.

Table 12 on the following page presents information about the size of each group in the screened sample as well as the confidence interval for the combined problem and probable pathological gambling prevalence rate. As in Table 11, the prevalence estimates in Table 12 were first calculated for the sample of respondents who completed

[5] As noted in the discussion of *Weighting and Imputation*, prevalence estimates were first calculated for respondents who completed the full interview (N=733) and then adjusted to the total sample (N=2217) in order to provide prevalence rates for the adult population of Nevada.

the full interview and then adjusted to the total sample. A similar procedure was used to adjust the confidence intervals for these prevalence estimates. Analyses of prevalence rates among several demographic groups have been suppressed because confidence intervals exceeded prevalence estimates among these small groups of respondents. All results where the confidence interval exceeds 50% of the prevalence estimate have been flagged with an asterisk.

Table 12: Prevalence by Demographic Group

		Group Size	Current Problem (3+)	Conf. Interval
Gender	Male	1101	8.2	±2.5
	Female	1066	4.4*	±2.2
Age	18 – 34	701	8.4	±3.2
	35 and older	1427	5.4	±2.0
Ethnicity	White	1506	5.5	±2.0
	Hispanic	372	7.1*	±3.9
	Other (inc. Black)	285	10.1*	±5.7
Time in NV	Born in NV / 30 or more	485	5.7*	±3.8
	11 – 30 years	707	6.5	±3.0
	10 years or less	952	7.0	±2.6
Region	Clark County	1501	7.0	±2.1
	Reno / Sparks / Carson City	465	5.3*	±3.8
Employed in gaming industry		304	11.5	±5.3
Education	HS or less	871	8.8	±3.0
	Some College	823	3.5*	±2.2
	College degree or more	463	6.4*	±3.7
Income	Up to $24,999	301	7.1*	±5.0
	$25,000 -- $34,999	260	9.7*	±5.7
	$35,000 -- $49,999	321	5.9*	±4.4
	$50,000 and higher	756	6.4	±2.8

*Confidence interval equals or exceeds 50% of the prevalence estimate.

Table 12 shows that there are substantial differences in the prevalence of current problem gambling in different sub-groups in the population. For example, the prevalence of problem gambling is nearly twice as high among men in Nevada as among women. In spite of the fact that older adults in Nevada do more gambling than younger adults (see discussion of *Gender, Age, Ethnicity and Gambling in Nevada* on Page 22), the prevalence of problem gambling is substantially higher among younger adults in Nevada. Although the confidence intervals around the prevalence rates for Hispanics and other non-White adults are relatively large, these rates are nevertheless substantially higher than the problem gambling prevalence rate among Whites in Nevada.

Prevalence by Type of Gambling

Another approach to understanding the relationship between gambling involvement and gambling-related problems is to examine the prevalence of problem gambling among individuals who participate in specific types of gambling. Table 13 shows the current prevalence of problem and probable pathological gambling for respondents who have gambled in the past year as well as for those who gamble weekly. Table 13 also shows the current prevalence of problem and probable pathological gambling for respondents who have participated in specific types of gambling in the past year. Telephone or computer wagering was not included in this table because the number of past year players was too small to yield meaningful results. Analyses of prevalence rates among past year gamblers on charitable events and at unlicensed establishments have been suppressed because the confidence interval equals or exceeds the prevalence estimate among these small groups of respondents. All results where the confidence interval exceeds 50% of the prevalence estimate have been flagged with an asterisk.

Table 13: Prevalence by Type of Gambling

Past Year Activities	Group Size	Current Prevalence (3+) %	Conf.
Past Year Gamblers	1506	7.6	±2.0
Weekly Gamblers	420	17.6	±5.3
Casino	1281	8.7	±2.3
Gaming machines (non-casino)	655	12.0	±3.7
Lottery	445	5.7*	±3.3
Private	197	17.2	±7.8
Bingo in bingo hall	127	11.4*	±8.6
Horse or dog racing	87	18.8*	±12.7
Cardroom	64	33.7*	±18.1

*Confidence interval equals or exceeds 50% of the prevalence estimate.

Table 13 shows that the current prevalence of problem gambling among past year lottery players may actually be lower than the prevalence of problem gambling among all past year gamblers. Similarly, the prevalence of problem gambling among past year casino players is only slightly higher than among past year gamblers in general. In contrast, the prevalence of problem gambling among past year players of non-casino gambling machines and among past year non-casino bingo players is about one and a half times higher than among past year gamblers in general. The prevalence of problem gambling is about two and a half times higher among individuals who have gambled privately in the past year and those who have gambled in the past year on horse or dog races than among past year gamblers. Finally, the prevalence of problem gambling among past year cardroom players is about four times higher than among past year gamblers in general.

While the small size of some of these groups of past year players suggests the need for caution in interpreting these numbers, this analysis points to the importance of targeting public education and prevention efforts in venues such as cardrooms, race tracks, racebooks and off track betting facilities as well as in grocery stores, convenience stores, gas stations and even laundromats where non-casino gaming machines are located.

Comparing Nevada with Other States

As with gambling participation, it is helpful to compare the prevalence of problem and probable pathological gambling in Nevada with comparable prevalence estimates elsewhere in the United States. Although the jurisdictions where problem gambling surveys have been done in the United States differ substantially in the types of gambling available, in levels of gambling participation and in the demographic characteristics of the general population, it is helpful to understand how Nevada compares with other jurisdictions.

Figure 2 shows prevalence rates of current problem and probable pathological gambling in states where surveys based on the South Oaks Gambling Screen have been completed since 1996 and where prevalence rates have been calculated in a comparable manner. In states where replication surveys have been completed, the most recent prevalence rates are shown.

Figure 2: Comparing Prevalence Rates in the United States

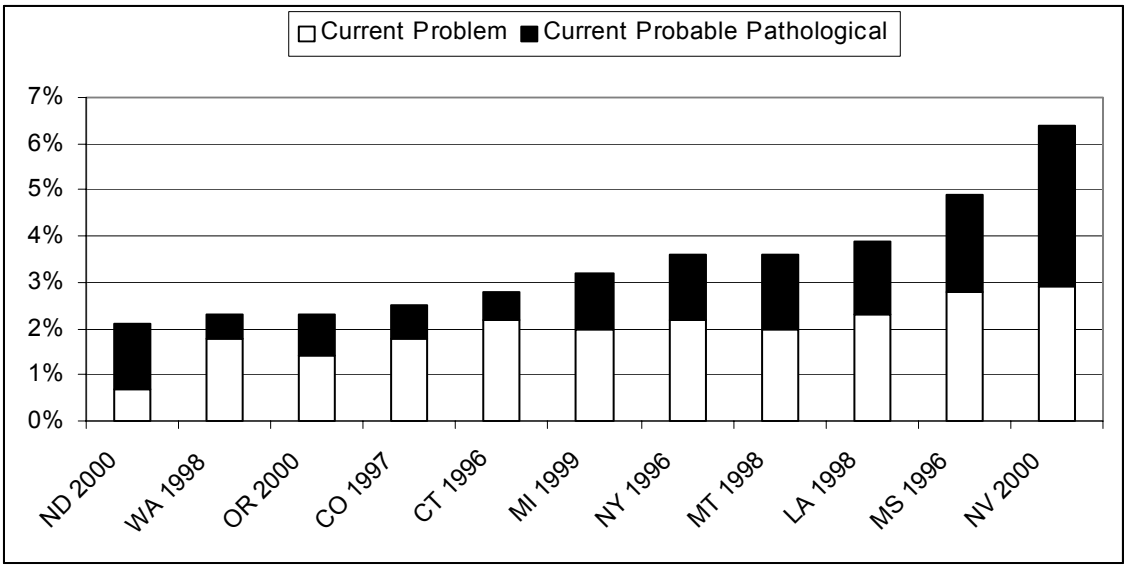


Figure 2 shows that the combined current prevalence rate of problem and probable pathological gambling in Nevada is higher than prevalence rates in every other state where problem gambling prevalence has been measured in the same way. Even more striking is the much higher prevalence rate of current probable pathological gambling in Nevada (the black part of the bar) than in any other state. The prevalence rate of probable pathological gambling alone in Nevada is higher than the combined prevalence of problem and probable pathological gambling in Colorado, Connecticut, Michigan, North Dakota, Oregon and Washington State. Only the ratio of probable pathological gambling to the overall prevalence rate in North Dakota (1:2) is higher than in Nevada (1:1.2).

COMPARING NON-PROBLEM AND PROBLEM GAMBLERS

In considering how best to develop and refine policies and programs for problem gamblers, it is important to direct these efforts in an effective and efficient way. The most effective efforts at prevention, outreach and treatment are targeted at individuals who are at greatest risk of experiencing gambling-related difficulties. Since the purpose of this section is to examine individuals at risk, our focus will be on differences between individuals who gamble, with and without problems, rather than on the entire sample of screened adults in Nevada.

In looking at differences between respondents who gamble with and without problems, our analysis is based on the lifetime NODS. For reasons outlined elsewhere in this report (see *Problem Gambling in Nevada* as well as Appendix A), the lifetime NODS is the best tool in the present context for assessing the differences between non-problem and problem gamblers in Nevada. Like the SOGS, the lifetime NODS is more accurate than the current NODS in identifying at-risk individuals in the general population. Given the number of respondents in the Nevada survey who scored as problem and pathological gamblers on the basis of the lifetime NODS, the two groups have been combined into a single group and will be referred to as problem gamblers in this section.

Demographics

Table 14 shows that, as in other jurisdictions, problem gamblers in Nevada are demographically distinct from non-problem gamblers. Problem gamblers in Nevada are significantly more likely than non-problem gamblers to be male, to be under the age of 25 and to be non-White. Table 14 also shows that problem gamblers in Nevada are significantly more likely than non-problem gamblers to have lived in Nevada for a decade or less.

Table 14: Demographics of Non-Problem and Problem Gamblers

		Non-Problem Gamblers (689) %	Problem Gamblers (44) %	Sig.
Gender	Male	59.1	79.5	.004
	Female	40.9	20.5	
Age	18 – 24	13.5	29.5	.013
	25 – 54	60.1	50.0	
	55 +	26.4	20.5	
Ethnicity	White	71.1	34.9	.000
	Black	5.5	7.0	
	Hispanic	15.8	34.9	
	Other	7.6	23.3	
Time in NV	Born in NV / More than 10 yrs	52.9	36.4	.024
	10 or less years	47.1	63.6	

Table 14 (cont'd): Demographics of Non-Problem and Problem Gamblers

		Non-Problem Gamblers (689) %	Problem Gamblers (44) %	Sig.
Marital Status	Married	56.1	36.6	.043
	Widowed	5.2	4.9	
	Divorced/Separated	18.8	22.0	
	Never Married	19.8	36.6	
Education	Elementary / Some HS	10.0	25.6	.010
	HS Grad	31.6	30.2	
	Some College	35.5	20.9	
	BA / BS / Graduate Study	22.9	23.3	
Income	Up to $25,000	15.8	28.1	.186
	$25,000 -- $49,999	35.6	31.3	
	$50,000 and higher	48.6	40.6	
Employed in gaming industry		16.7	32.6	.000

Table 14 shows that problem gamblers in Nevada are significantly less likely than non-problem gamblers to be married and to have graduated from high school. While the difference does not achieve statistical significance, problem gamblers in Nevada are less likely than non-problem gamblers to have annual household incomes over $25,000. Finally, Table 14 shows that problem gamblers in Nevada are significantly more likely than non-problem gamblers to be employed in the gaming industry.

Results of the 2000 Census showed that Nevada had the highest rate of population growth between 1990 and 2000 in the United States (66%). The bulk of this growth is accounted for by immigration into the Las Vegas metropolitan area, largely by persons of Hispanic or Latino origin—the proportion of the Nevada population of Hispanic or Latino origin increased from 10% to 20% between 1990 and 2000. The large proportion of problem gamblers in Nevada who are recent immigrants and Hispanic has important implications for the development and design of problem gambling services in the state—such as where services are located and whether services are made available in Spanish.

The over-representation of recent immigrants among problem gamblers in Nevada is consistent with findings from the Nevada adolescent study that suggest a possible "exposure" effect in jurisdictions with longstanding and widespread legal gambling (Volberg, 2002). This study found that Nevada adolescents, who have spent most or all of their lives in the midst of a mature casino gambling environment, are less likely than adolescents in other jurisdictions to gamble at all and to experience gambling-related problems.

Gambling Participation

While information about the demographic characteristics of problem gamblers is useful in designing prevention and treatment services, it is also helpful to understand differences in the gambling behavior of non-problem and problem gamblers. Information about the behavioral correlates of problem gambling can help treatment professionals effectively

identify at-risk individuals, design appropriate treatment measures and establish accessible services.

Lifetime. In contrast to problem gamblers in many other jurisdictions, problem gamblers in Nevada are not significantly more likely than non-problem gamblers to have ever tried most of the different types of gambling included in the survey. Problem gamblers in Nevada are significantly more likely than non-problem gamblers to have ever played in a cardroom, to have gambled privately, and to have gambled on the Internet. Problem gamblers in Nevada are somewhat more likely than non-problem gamblers to have gambled on non-casino gaming machines, to have purchased lottery tickets, to have wagered on horse or dog races, and to have played bingo in a bingo hall. Non-problem and problem gamblers in Nevada are equally likely to have ever gambled at a casino.

Past Year. Table 15 shows differences in past year involvement in different types of gambling by non-problem and problem gamblers in Nevada. Only those types of gambling for which past year participation among problem gamblers is 10% or higher are shown. Table 15 shows that problem gamblers in Nevada are significantly more likely than non-problem gamblers to have gambled in the past year at a casino and on non-casino gaming machines as well as privately, at a cardroom and on horse or dog races. It is interesting that problem gamblers in Nevada are actually less likely than non-problem gamblers to have purchased a lottery ticket in the past year.

Table 15: Past Year Activities by Non-Problem and Problem Gamblers

Past Year Activities	Non-Problem Gamblers (689) %	Problem Gamblers (44) %	Sig.
Casino	83.9	95.3	.026
Gaming machines (non-casino)	41.9	61.4	.009
Private	12.6	27.9	.008
Lottery	30.6	20.9	.120
Cardroom	3.0	20.5	.000
Bingo in bingo hall	7.7	14.0	.123
Horse or dog races	5.1	13.6	.030

All of the gambling activities that problem gamblers in Nevada are significantly more likely to have done in the past year than non-problem gamblers are legally available, continuous types of gambling. Continuous forms of gambling are characterized by rapid cycles of play as well as the opportunity for players to immediately reinvest their winnings (Dickerson, 1993a; Walker, 1992). Most of the legal forms of gambling in Nevada are continuous, including casino table games and slot machines, non-casino gaming machines, pari-mutuel wagering on horse or dog races, bingo, and card games in cardrooms.

Monthly. Table 16 on the following page shows differences in monthly involvement in different types of gambling by non-problem and problem gamblers in Nevada. As with past year gambling, only those activities for which monthly participation among problem gamblers is 10% or higher are shown. Table 16 shows that problem gamblers in Nevada are significantly more likely than non-problem gamblers to gamble monthly or more often at a casino and on non-casino gaming machines as well as privately and at a cardroom.

Table 16: Monthly Activities by Non-Problem and Problem Gamblers

Monthly Activities	Non-Problem Gamblers (689) %	Problem Gamblers (44) %	Sig.
Casino	46.3	81.8	.000
Gaming machines (non-casino)	21.2	48.8	.000
Private	4.9	18.2	.002
Lottery	8.6	14.0	.172
Cardroom	1.3	14.0	.000

Weekly. Not surprisingly, problem gamblers in Nevada are significantly more likely than non-problem gamblers to gamble weekly or more often at a casino, on non-casino gaming machines and at cardrooms.

Other Significant Differences[6]

In addition to their demographic characteristics and gambling involvement, there are other significant differences between non-problem and problem gamblers in Nevada. These include differences in respondents' perceptions of their gambling careers and involvement, differences in their reasons for gambling, and differences in the impacts of their gambling on physical and mental health as well as on family, finances and community.

Table 17 shows that, in contrast to many other jurisdictions, there is no significant difference in the age at which non-problem and problem gamblers started gambling in Nevada. Consistent with other jurisdictions, Table 17 shows that problem gamblers are significantly more likely than non-problem gamblers in Nevada to have felt nervous about their gambling and to believe that one or both parents has had a gambling problem. Also as in other jurisdictions, problem gamblers in Nevada are also significantly more likely than non-problem gamblers to gamble alone or with friends or co-workers rather than with their spouse or family members. Finally, as in other jurisdictions, Table 17 shows that there are significant differences between non-problem and problem gamblers in Nevada in terms of the financial resources that they devote to gambling. Problem gamblers are significantly more likely than non-problem gamblers to acknowledge having lost substantial amounts of money in a single day and in a single year.

Table 17: Differences in Gambling Careers and Participation

	Non-Problem Gamblers (334) %	Problem Gamblers (44) %	Sig.
Mean Age Started Gambling	24.2	21.9	.201
Ever felt nervous about your gambling	18.1	51.2	.000
Parent ever have gambling problem	8.1	24.4	.003

[6] As noted above, CCSR mistakenly attempted to administer the full interview to all monthly as well as weekly gamblers between October, 2000 and January, 2001. In January, CCSR was instructed to administer the full interview to weekly gamblers only in an effort to increase the overall number of screening interviews. As a result, the number of respondents to whom the entire interview was administered is substantially smaller than the number of respondents who answered the gambling involvement section and the two problem gambling screens.

Table 17 (cont'd): Differences in Gambling Careers and Participation

	Non-Problem Gamblers (334) %	Problem Gamblers (44) %	Sig.
Company			
Alone	29.4	42.9	.001
Spouse or family	40.8	11.9	
Friends or co-workers	29.7	45.2	
Largest Amount Lost in One Day			
Less than $100	56.6	20.5	.000
$100 -- $999	34.1	40.9	
$1,000 or more	9.3	38.6	
Largest Amount Lost in Single Year			
Never lost money	4.0	---	.000
Less than $1,000	70.2	30.2	
$1,000 or more	25.8	69.8	

Table 18 shows differences in the reasons that non-problem and problem gamblers in Nevada endorse for gambling. Problem gamblers in Nevada are significantly more likely than non-problem gamblers to say that excitement and challenge, winning money and distraction from everyday problems are important or very important reasons for gambling. It is interesting that problem gamblers in Nevada are less likely than non-problem gamblers to say that entertainment is an important or very important reason to gamble.

Table 18: Differences in Reasons for Gambling

Reasons for Gambling*	Non-Problem Gamblers (340) %	Problem Gamblers (44) %	Sig.
For excitement or challenge	33.0	50.0	.024
To win money	64.3	84.1	.005
For entertainment or fun	73.1	60.5	.063
As a distraction from everyday problems	12.8	32.6	.002

*Proportion endorsing "important" or "very important."

Table 19 on the following page presents differences between non-problem and problem gamblers in Nevada on physical and mental health dimensions. Table 19 shows that problem gamblers are only slightly more likely than non-problem gamblers in Nevada to identify their physical health status as poor or fair, rather than as good or excellent. Problem gamblers are significantly more likely than non-problem gamblers in Nevada to acknowledge that they are presently very troubled by their "emotions, nerves or mental health" and to acknowledge that they have experienced symptoms of a manic episode or major depression at some time in their lives.

Questions on the physical and mental health of problem and non-problem gamblers have only been included in general population surveys of gambling and problem gambling since the U.S. national survey (Gerstein et al, 1000). Compared to the national sample, problem gamblers in Nevada are less likely to rate their physical and mental health as poor but just as likely to acknowledge manic symptoms or a major depressive episode.

Table 19: Differences in Physical and Mental Health

	Non-Problem Gamblers (340) %	Problem Gamblers (44) %	Sig.
Health Status			
Physical health status fair or poor	18.3	25.6	.175
Very troubled by emotions, nerves, MH	1.5	7.7	.006
Manic episode (ever)	3.8	15.9	.002
Depression (ever)	12.5	39.5	.000
Alcohol and Drug Use			
Daily tobacco use	10.9	23.3	.020
Weekly alcohol use	15.2	23.3	.119
Monthly marijuana use	2.9	14.0	.003
Monthly cocaine use	0.3	2.3	.166
Problems due to alcohol in past year	5.2	20.9	.001
Problems due to drugs in past year	0.9	2.3	.346
Help Seeking			
Help sought for alcohol or drug problems (ever)	4.2	12.2	.043
Help sought for gambling problem (ever)	0.3	7.0	.005

Table 19 also shows that problem gamblers in Nevada are significantly more likely than non-problem gamblers to smoke or chew tobacco on a daily basis and to use marijuana once a month or more often. Although problem gamblers in Nevada are only somewhat more likely than non-problem gamblers to drink alcoholic beverages once a week or more often, they are significantly more likely to acknowledge difficulties due to their use of alcohol in the past year. These difficulties include drinking or using drugs more often or in larger amounts than intended, spending increasing amounts of time obtaining alcohol or drugs or getting over their effects, making ineffective efforts to stop drinking or using, missing important personal and social obligations and experiencing emotional and health problems due to alcohol or drug consumption. Finally, Table 19 shows that problem gamblers in Nevada are significantly more likely than non-problem gamblers to have ever sought help for an alcohol or drug problem as well as for a gambling problem. Together, these data suggest that a substantial number of problem gamblers in Nevada have experienced mental health or substance abuse problems and have accessed the health care system in a variety of ways.

Table 20 on the following page shows differences in the impacts of gambling on family, finances and the criminal justice system among non-problem and problem gamblers in Nevada. Problem gamblers are significantly more likely than non-problem gamblers to have argued with someone they lived with in the past year about their own gambling and, interestingly, to say that they have been troubled in the past year by the gambling of someone with whom they live.

As with questions on the physical and mental health of problem and non-problem gamblers, questions about the impacts of gambling have only been included in general population surveys of gambling and problem gambling since the U.S. national survey (Gerstein et al, 1999). Compared to the national sample, problem gamblers in Nevada are less likely to have ever declared bankruptcy, been arrested or incarcerated.

Table 20: Differences in Family, Financial and Criminal Justice Impacts

	Non-Problem Gamblers (340) %	Problem Gamblers (44) %	Sig.
Family Impacts			
Anyone lived with in past year w/gambling problem	9.2	26.2	.003
Arguments about own gambling	1.2	11.6	.002
Financial Impacts			
Ever filed for bankruptcy	7.6	5.3	.067
Criminal Justice Impacts			
Ever arrested or detained	13.1	21.1	.001
Ever incarcerated	19.2	33.3	.006

Table 20 shows that problem gamblers are no more likely than non-problem gamblers in Nevada to acknowledge that they have filed for bankruptcy at some time in their lives. It is worth noting that problem gamblers were three times more likely than non-problem gamblers to refuse to answer this question. Table 20 also shows differences between non-problem and problem gamblers in Nevada in their impacts on the criminal justice system. Problem gamblers are significantly more likely than non-problem gamblers in Nevada to have ever been arrested and incarcerated. These significant differences were obtained in spite of the refusal of one-quarter of the problem gamblers to answer the question about whether they had ever been arrested or detained and the refusal of half of the problem gamblers to answer the question about whether they had ever been incarcerated.[7]

Comparing the Survey and Helpline Data

We noted at the beginning of this report (see *Problem Gambling in Nevada* on Page 6) that information was available on the characteristics of callers to the Nevada problem gambling helpline (Chen, 1998). The availability of the helpline data provides an important opportunity to compare the characteristics of problem gamblers in the general population with those who are prepared to seek help for a gambling problem in Nevada.

Among the 118 callers to the Nevada Council's helpline in 1996 and 1997 seeking help, approximately two-thirds were men, compared with 80% of the problem gamblers in our sample surveyed in 2000. Over three-quarters (78%) of the callers were between the ages of 26 and 54, compared with 50% of the problem gamblers in our survey sample. The majority of the helpline callers were White, compared with only one-third of the problem gamblers in our survey sample. Finally, about two-thirds of the helpline callers were married, compared to only 37% of the problem gamblers in our survey sample.

This comparison suggests that problem gamblers who are ready to seek help in Nevada are more likely than those in the population generally to be older, White married women.

[7] In contrast, 7% of the non-problem gamblers refused to answer the question about arrest or detention and 20% of the non-problem gamblers refused to answer the question about incarceration.

COMPARING TWO PROBLEM GAMBLING SCREENS IN NEVADA

In the Nevada survey, a new problem gambling screen based on the most recent criteria for pathological gambling was used in addition to the current version of the South Oaks Gambling Screen (SOGS). The SOGS was used in order to obtain prevalence data comparable to the large number of similar surveys carried out in the United States and internationally. The NORC DSM Screen for Problem Gambling (NODS) was included in the Nevada survey to provide an assessment of pathological gambling using the most current psychiatric criteria. While the analysis presented here does not answer questions about the validity and reliability of the NODS in relation to clinical assessments, the results of the Nevada survey provide an important opportunity to understand how two different methods to identify problem and pathological gamblers in the general population operate in relation to one another.

The NORC DSM Screen for Problem Gambling (NODS)

The NODS is based on the most recent diagnostic criteria for pathological gambling (American Psychiatric Association, 1994). The NODS is composed of 17 items, compared to the 20 items that make up the South Oaks Gambling Screen. The maximum score on the NODS is 10 compared to 20 for the South Oaks Gambling Screen. Although there are fewer items in the NODS, and the maximum score is lower, the NODS is actually more restrictive in assessing problematic behaviors than the SOGS. A discussion of the development of the NODS is presented in Appendix A of this report. Table 21 presents information about the proportion of the total Nevada sample (N=2217) who score on an increasing number of items on the lifetime and past year NODS.[8]

Table 21: Scores on NODS (Lifetime & Past Year)

Number of Items	Lifetime	Past Year
	(2217)	(2217)
Non-Gamblers	14.4	14.4
Non Problem (0)	69.6	79.7
1	8.3	3.0
2	2.6	0.8
At Risk	10.9	3.8
3	1.9	1.1
4	1.2	0.7
Problem	3.0	1.8
5	1.4	---
6	0.4	0.2
7+	0.3	0.1
Pathological	2.1	0.3
Combined Problem/Path	5.1	2.1

[8] As with the SOGS-based prevalence rate, NODS-based prevalence rates were first calculated for respondents who completed the full interview (N=733) and then adjusted to the total sample (N=2217) in order to provide prevalence rates applicable to the adult population of Nevada.

One important difference between the NODS data from Nevada and the U.S. national survey involved the use of an additional selection criterion in the national survey. In the U.S. national survey, the NODS was only administered to respondents who indicated (in a separate section of the questionnaire) that they had lost $100 or more in a single day or over the course of a single year (Gerstein et al, 1999). There is a small but interesting group of respondents in the Nevada survey (N=16) who scored on the lifetime and/or past year NODS but who claimed never to have lost $100 or more in one day or in a single year. Further research is planned to examine the demographic characteristics, gambling involvement and gambling careers of these individuals.

Statistical Properties of the NODS

Information about the psychometric properties of the NODS among Nevada respondents is important in assessing the relationship between the two different methods used to identify problem and pathological gamblers used in the survey. These analyses were carried out using only the sample of respondents who were administered the two problem gambling screens (N=728).

The accuracy of any instrument is measured by looking at the reliability and validity of the instrument (Litwin 1995). The reliability of an instrument refers to the ability to reproduce the results of the application of the test. The validity of an instrument refers to the ability of the instrument to measure what it is intended to measure. In examining the psychometric properties of the NODS, we assess its reliability by examining the internal consistency of the screen and then analyze the individual items to determine the ability of the screen to discriminate effectively between non-problem and problem gamblers. We then examine several forms of validity for the NODS.

Reliability

The most widely accepted test of reliability is a measure if the internal consistency of an instrument. The reliability of both the lifetime and past year NODS (N=17 items each) in the Nevada sample of gamblers is good with Cronbach's alpha at .87 and .84 respectively. These alphas are substantially higher than the .70 that is generally accepted as representing good reliability. The reliability of the more limited set of items that are scored for the NODS (N=10 items each) is slightly lower than the full scale, with Cronbach's alpha at .77 for the lifetime screen and .76 for the past year screen. Reliability of the past year SOGS (N=20 items) in the Nevada sample of gamblers is .79 which is also acceptably high.

In addition to testing the internal consistency of the NODS, a factor analysis of the screen was used to assess how the individual items of the lifetime NODS cluster together. A single factor, unrotated solution showed that the 17 individual NODS items, as well as the reduced pool of 10 scored items, demonstrated loadings that deviated significantly from zero and accounted for 28% of the total variance in the lifetime NODS score. This analysis indicates that the NODS is a clearly homogeneous scale. Table 22 presents information about component loading of the scored lifetime NODS items in the single factor solution.

Table 22: Lifetime NODS Single Factor Analysis

NODS Scored Items	Component Loading
Preoccupation	.629
Tolerance	.579
Withdrawal	.422
Loss of Control	.167
Escape	.570
Chasing	.610
Lying	.314
Illegal Acts	.503
Risked Significant Relationship	.645
Bailout	.643

Item Analysis

Endorsement of the lifetime NODS items among respondents to whom the screen was administered ranged from a high of 15.5% (Escape) and 15.4% (Chasing) to a low of 1.2% (Illegal Acts). It is instructive to compare positive responses to specific items by problem gamblers and non-problem gamblers to see how well the different items discriminate between these groups. For this analysis, we used the current SOGS classification of non-problem and problem gamblers to prevent confusion between the method of classifying respondents and the items by which they were classified.

Table 23: Comparing SOGS Non-Problem and Problem Gamblers

NODS Scored Items	Non-Problem Gamblers (627) %	Problem Gamblers (101) %	Sig.
Preoccupation	4.0	36.6	.000
Tolerance	2.2	25.7	.000
Withdrawal	1.8	26.7	.000
Loss of Control	1.4	21.8	.000
Escape	9.3	54.5	.000
Chasing	9.6	51.5	.000
Lying	1.6	15.8	.000
Illegal Acts	0.2	7.9	.000
Risked Significant Relationship	0.5	14.9	.000
Bailout	0.8	20.8	.000
Mean NODS Score	0.31	2.76	.000

Table 23 shows that all of the NODS items discriminate effectively between SOGS-defined problem and non-problem gamblers in Nevada. The most effective discriminator among the NODS items is Escape with 55% of the SOGS problem and probable pathological gamblers scoring a positive response in contrast to only 9% of the non-problem gamblers. The next best discriminator is Chasing, with 52% of the SOGS problem and probable pathological gamblers scoring a positive response compared to 10% of the non-problem gamblers. Table 23 also shows that there is a significant difference in mean scores on the lifetime NODS items for non-problem and problem

gamblers, supporting the notion that the NODS measures something similar to the SOGS.

Validity

There are several different types of validity that can be measured to assess the performance of an instrument. These include content, criterion, congruent and construct validity. Content validity is a subjective measure of how appropriate the items seem to a set of reviewers who have some knowledge of the subject matter. Since the NODS is closely based on the DSM-IV criteria, and since these criteria have been shown to have good content validity, it is likely that the NODS also has good content validity (Lesieur & Rosenthal, 1991).

Criterion Validity

Criterion validity requires that the instrument be judged against some other method that is acknowledged as a standard for assessing the same phenomenon. As a first step, we calculated the correlation coefficient between the lifetime and current NODS and the current SOGS. The result of both of these analyses were statistically significant above the .001 level (Lifetime NODS / SOGS Pearson correlation coefficient=.72; current NODS / SOGS Pearson correlation coefficient=.47). These results suggest that the relationship between the lifetime NODS score and the current SOGS score is better than the relationship between the current NODS and the current SOGS. Again, this is a question that deserves further research attention.

To better understand how the SOGS and the NODS operate in relation to one another, it is useful to examine how respondents scored on each of these instruments in more detail. Table 24 shows the number of respondents in the Nevada sample who scored at different levels on the current SOGS and the lifetime NODS.

Table 24: Comparing Scores on the SOGS and the NODS

	NODS				
SOGS	0	1 - 2	3 - 4	5+	Total
0	368	49	5	---	422
1 - 2	131	63	8	3	205
3 – 4	11	30	9	5	55
5+	3	11	14	18	46
Total	513	153	36	26	728

Table 24 shows that the lifetime NODS operates quite well in relation to the current SOGS in Nevada. Respondents who score low on the NODS also tend to score low on the SOGS and 74% of the respondents who score three or more on the NODS also score three or more on the SOGS. The current SOGS does not operate quite as well in relation to the lifetime NODS since only 46% of respondents who score three or more on the current SOGS also score at this level or above on the lifetime NODS.

Congruent Validity

Since several of the items on the SOGS and NODS are similar, it is possible to check whether respondents answered similar questions differently. It is worth reminding readers that the NODS items are the lifetime questions while the SOGS items were all framed in the past year. Table 25 shows how respondents who gambled answered several similar questions from the current SOGS and the lifetime NODS.

Table 25: Comparing Scores on Similar SOGS and NODS Items

	SOGS or NODS Item	Positive Score (728) %
CHASING	Go back another day to win money you lost (chasing) (SOGS)	4.8
	Often return another day to get even (chasing) (NODS)	15.4
LYING	Claimed to win when in fact lost (SOGS)	8.9
	Lied three or more times to family/others about gambling (NODS)	3.6
TOLERANCE	Spend more time or money gambling than intended (SOGS)	24.7
	Need to gamble with increasing amounts to get same excitement (NODS)	5.5
LOSS OF CONTROL	Would like to stop gambling but couldn't (SOGS)	6.4
	Made 3+ attempts to stop, cut down or control gambling (NODS)	4.3

Table 25 shows generally that respondents are less likely to give an answer that scores as a positive response on the lifetime NODS than on the current SOGS. This is particularly the case for the items assessing Tolerance. Respondents are much more likely to give a positive answer to the NODS question assessing Chasing than to the SOGS item assessing the same behavior. This analysis suggests that further research is needed on the cognitive properties of all of the problem gambling screens presently in use.

Comparing SOGS and NODS Problem Gamblers[9]

The lifetime prevalence of problem gambling in Nevada, measured by the NODS, is lower than the current prevalence of problem gambling identified using the current South Oaks Gambling Screen. Table 26 on the following page compares the demographic characteristics of problem gamblers as defined by the NODS with problem gamblers as defined by the current SOGS. Since both the SOGS and the NODS groups are relatively small, and since most of the NODS problem group are part of the SOGS problem group as well, no effort has been made to test the differences for statistical significance. Table 26 shows that problem gamblers identified using the lifetime NODS are somewhat more likely than problem gamblers identified with the current SOGS to be male, non-White and to have lived in Nevada for less than a decade. Table 26 also shows that problem gamblers identified with the NODS are somewhat less likely than those identified with the SOGS to be married and to have graduated from high school.

[9] WTLONG was used for this analysis in order to maintain comparability with results reported earlier in the report and to allow generalization to the gambling population of Nevada.

Table 26: Comparing SOGS and NODS Problem Gamblers

		SOGS Problem Gamblers (56) %	NODS Problem Gamblers (44) %
Gender	Male	73.2	79.5
	Female	26.8	20.5
Age	18 – 34	45.5	43.2
	35 – 54	36.4	38.6
	55+	18.2	18.2
Ethnicity	White	55.4	34.9
	Black	3.6	7.0
	Hispanic	23.2	34.9
	Other	17.9	23.3
Time in NV	Born in NV / 30+ years	16.1	15.6
	11 – 30 years	32.1	22.2
	10 years or less	51.8	62.2
Marital Status	Married	50.0	36.6
	Widowed	5.6	4.9
	Divorced/Separated	14.8	22.0
	Never Married	29.6	36.6
Education	Elementary / Some HS	14.5	25.6
	HS Grad	45.5	30.2
	Some College	18.2	20.9
	BA Degree	14.5	18.6
	Graduate Study	7.3	4.7

SUMMARY AND CONCLUSION

The purpose of this study was to provide estimates of the prevalence and distribution of problem gambling among Nevada citizens for the first time. The results of this study are intended to assist the State in determining potential public policy and/or State programs to implement to address problem gambling in Nevada.

Summary

The types of gambling that Nevada residents are most likely to have tried are gambling at a casino, playing lottery games (which are not legal in Nevada) and gambling on non-casino gaming machines. Non-gamblers and infrequent gamblers in Nevada are most likely to be female, under the age of 35, Hispanic, keeping house, and to have annual household incomes under $35,000. Monthly and weekly gamblers in Nevada are most likely to be male, over the age of 55, White, retired, disabled or unemployed, and to have annual household incomes over $35,000.

The combined prevalence of problem and probable pathological gambling in Nevada is 6.4%--higher than in every other jurisdiction where similar surveys have been carried out. Problem gambling prevalence rates are highest among men, younger adults, and minorities in Nevada. Problem gambling prevalence rates are also high among those employed in the gaming industry, among those with a high school education or less and among those with annual household incomes under $35,000. Problem gambling prevalence rates are highest among individuals who have gambled in the past year at cardrooms, on horse or dog racing, on bingo and on non-casino gaming machines.

Further analysis shows that lifetime problem gamblers in Nevada (those most likely to be in need of services) are significantly more likely than non-problem gamblers to be male, under the age of 25 and non-White. Lifetime problem gamblers are also significantly more likely than non-problem gamblers to have lived in Nevada for a decade or less. Problem gamblers in Nevada are significantly more likely than non-problem gamblers to gamble monthly or more often at a casino and on non-casino gaming machines as well as privately and at a cardroom.

Problem gamblers in Nevada are significantly more likely than non-problem gamblers to have been troubled in the past year by the gambling of someone they live with, to have engaged in arguments about their own gambling, and to have ever been arrested and/or incarcerated. Problem gamblers in Nevada are significantly more likely than non-problem gamblers to smoke daily and to use marijuana on a monthly basis. In spite of similar rates of weekly alcohol consumption, problem gamblers in Nevada are significantly more likely than non-problem gamblers to report experiencing problems in the past year due to their use of alcohol and to have sought help for an emotional or substance abuse problem. Finally, problem gamblers in Nevada are significantly more likely than non-problem gamblers to have ever experienced an episode of mania or depression.

Directions for the Future

The impacts of gambling-related problems can be high, not only for individuals but also for families and communities. Pathological gamblers experience physical and psychological

stress and exhibit substantial rates of depression, alcohol and drug dependence and suicidal ideation. The families of pathological gamblers experience physical and psychological abuse as well as harassment and threats from bill collectors and creditors. Other significant impacts include costs to employers, creditors, insurance companies, social service agencies and the civil and criminal justice systems (Lesieur, 1998; Volberg, 2001a).

The impacts of gambling-related problems are not limited to those at the most severe end of the problem gambling continuum. Indeed, it is likely that problem and at-risk gamblers account for the largest proportion of the social costs of disordered gambling (Korn & Shaffer, 1999). It is also likely—if the addiction model applies—that problem and at-risk gamblers will be more responsive than pathological gamblers to prevention and intervention efforts.

How Many To Plan For?

One important purpose of a prevalence survey is to identify the number of individuals in a jurisdiction who may need treatment services for gambling-related difficulties at a given point in time. Experience in many jurisdictions suggests that not all of the individuals in need of treatment for a physical or psychological problem will seek out such treatment. From a policy perspective, the question is: How many individuals should we plan to provide for?

Recent research indicates that approximately 3% of individuals with severe alcohol-related difficulties actually seek treatment in any one year (Smith, 1993). Based on research in Australia as well as in Oregon, where services for problem gamblers are widely available, it appears that the proportion of current pathological gamblers who seek treatment in any one year is quite similar (Dickerson, 1997; Volberg, 1997). In calculating the number of problem and pathological gamblers who might seek treatment in Nevada, we focus on the group of individuals who score as current probable pathological gamblers (e.g. the 40,100 to 63,900 individuals represented by the confidence interval around the point estimate for current probable pathological gambling in Nevada). Based on this approach, we estimate that Nevada should plan to provide problem gambling treatment services to between 1,200 and 1,900 individuals per year.

Recommendations

Given the high prevalence rate of problem and probable pathological gambling in Nevada and the dearth of services in the state, there are several steps that state legislators and other concerned parties may wish to consider implementing in Nevada. In making such decisions, consideration could be given to developing the following services and activities:

- working with ***insurance companies*** to obtain coverage for treatment services for individuals with gambling-related difficulties;

- refinement of ***public education and prevention services*** targeted toward particular at-risk groups (e.g. youth, minorities) as well as venues where problem gamblers are most likely to be found. These include cardrooms, race tracks, racebooks and off track betting facilities as well as locations where non-casino gaming machines are available;

- support of ***industry policies and programs*** to minimize gambling-related difficulties among patrons;

- development of specific ***government-industry initiatives*** to address problem gambling issues in Nevada;

- expanding ***training opportunities*** to educate more mental health, alcohol and substance abuse treatment professionals in how to screen for gambling problems and pathology as well as when and where to refer such individuals for appropriate treatment;

- establishment of a state-level ***gambling counselor certification program*** to ensure that individuals seeking help for gambling-related difficulties receive appropriate and effective services;

- an ***increase*** in funding to support education, prevention and treatment of problem gambling through the Department of Human Resources;

- ***evaluation*** of existing services as well as those established in the future; and

- continued ***monitoring*** of gambling and problem gambling prevalence to assess the impacts of legal gambling on the residents of Nevada.

REFERENCES

Abbott, M. W. 2001. What Do We Know About Gambling and Problem Gambling in New Zealand? Wellington: Department of Internal Affairs.

Abbott, M. W. & R. A. Volberg. 1992. Frequent Gamblers and Problem Gamblers in New Zealand: Report on Phase Two of the National Survey. Research Series No. 14. Wellington: New Zealand Department of Internal Affairs.

Abbott, M. W. & R. A. Volberg. 1996. "The New Zealand National Survey of Problem and Pathological Gambling," Journal of Gambling Studies, 12 (2): 143-160.

Abbott, M. W. & R. A. Volberg. 1999a. Gambling and Problem Gambling in the Community: An International Overview and Critique. Wellington: Department of Internal Affairs.

Abbott, M. W. & R. A. Volberg. 1999b. "A Reply to Gambino's `An Epidemiologic Note on Verification Bias: Implications for Estimation of Rates,'" Journal of Gambling Studies 15 (3): 233-242.

Abbott, M. W. & R. A. Volberg. 2000. Taking the Pulse on Gambling and Problem Gambling in New Zealand: Phase One of the 1999 National Prevalence Survey. Wellington: Department of Internal Affairs.

Abbott, M. W., R. A. Volberg & S. Rönnberg. 2001. The New Zealand and Swedish National Surveys of Gambling and Problem Gambling: Similarities and Differences. Paper presented at the 15th National Conference on Problem Gambling. Seattle, WA.

Alonso, W. & P. Starr (eds.). 1987. The Politics of Numbers. New York: Russell Sage Foundation.

American Psychiatric Association. 1980. Diagnostic and Statistical Manual of Mental Disorders, Third Edition. Washington, DC: American Psychiatric Association.

American Psychiatric Association. 1994. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association.

Becker, H. S. 1960. "Notes on the Concept of Commitment," American Journal of Sociology 66: 32-40.

Bondolfi, G., C. Osiek & F. Ferrero. 2000. "Prevalence Estimates of Pathological Gambling in Switzerland," Acta Psychiatrica Scandinavica 101 (6): 473-475.

Chen, S-L. 1998. "Task Force on Problem Gambling in Nevada," Advances in Hospitality and Tourism Research, Vol. III. Proceedings of the Third Annual Graduate Education and Graduate Students Research Conference in Hospitality & Tourism, K. Chon & C. Mok (eds).

Christiansen, E. M. 1998. "The United States 1997 Gross Annual Wager: A New Entitlement," International Gaming & Wagering Business 19 (8).

Christiansen, E. M. & S. Sinclair. 2001. "The United States 2000 Gross Annual Wager: Growth Rate Disappoints," International Gaming & Wagering Business 22 (8): 1, 32.

Clotfelter, C. T. & P. J. Cook. 1989. Selling Hope: State Lotteries in America. Cambridge: Harvard University Press.

Cochran, W. G. 1963. Sampling Techniques, 2nd edition. New York: Wiley.

Cox, S., H. R. Lesieur, R. J. Rosenthal & R. A. Volberg. 1997. Problem and Pathological Gambling in America: The National Picture. Columbia, MD: National Council on Problem Gambling.

Culleton, R. P. 1989. "The Prevalence Rates of Pathological Gambling: A Look at Methods," Journal of Gambling Behavior 5: 22-41.

Cunningham-Williams, R. M., L. B. Cottler, W. M. Compton & E. L. Spitznagel. 1998. "Taking Chances: Problem Gamblers and Mental Health Disorders – Results from the St. Louis Epidemiologic Catchment Area Study," American Journal of Public Health 88 (7): 1093-1096.

Dean, J. 1979. "Controversy Over Classification: A Case Study From the History of Botany." In Natural Order: Historical Studies of Scientific Culture, B. Barnes & S. Shapin (eds). Beverly Hills, CA: Sage Publications.

DePolo, R. & M. Pingle. 1997. "Nevada Gaming: Revenue and Taxes (1945-95)," Journal of Gambling Studies 13 (1): 49-67.

Dickerson, M. G. 1993a. "Internal and External Determinants of Persistent Gambling: Problems in Generalising from One Form of Gambling to Another," Journal of Gambling Studies 9 (3): 225-245.

Dickerson, M. G. 1993b. "A Preliminary Exploration of a Two-Stage Methodology in the Assessment of the Extent and Degree of Gambling-Related Problems in the Australian Population." In Gambling Behavior and Problem Gambling. W. R. Eadington & J. A. Cornelius (eds). Reno: Institute for the Study of Gambling and Commercial Gaming.

Dickerson, M. G. 1997. The Australian Experience of the Development of Strategies to Address Gambling Related Problems in the Community: Implications for Other Jurisdictions. Paper presented at the 10th International Conference on Gambling and Risk Taking. Montreal, CANADA.

Dixey, R. 1996. "Bingo in Britain: An Analysis of Gender and Class." In Gambling Cultures: Studies in History and Interpretation, J. McMillen (ed). London: Routledge.

Dohrenwend, B. P. 1995. "The Problem of Validity in Field Studies of Psychological Disorders, Revisited." In Textbook in Psychiatric Epidemiology, T. T. Ming, M. Tohen & G. E. P. Zahner (eds),. New York: Wiley-Liss. (Pp. 3-20).

Dohrenwend, B. P. 1998. "A Psychosocial Perspective on the Past and Future of Psychiatric Epidemiology," American Journal of Epidemiology 147 (3): 222-231.

Drake, S. C. & H. Cayton. 1945. Black Metropolis. New York, NY: Harcourt Brace & Co.

Emerson, M. O. & J. C. Laundergan. 1996. "Gambling and Problem Gambling Among Adult Minnesotans: Changes 1990 to 1994," Journal of Gambling Studies 12 (3): 291-304.

Findlay, J. M. 1986. People of Chance: Gambling in American Society from Jamestown to Las Vegas. New York: Oxford University Press.

Fisher, S. E. 2000. "Measuring the Prevalence of Sector-Specific Problem Gambling: A Study of Casino Patrons," Journal of Gambling Studies 16 (1): 25-51.

Gallup Organization, 1999. "Gambling in America: Topline and Trends". Princeton, NJ. Accessible at www.gallup.com/poll/socialaudits/gambling2.asp.

Gambino, B. 1999. "An Epidemiologic Note on Verification Bias: Implications for Estimation of Rates," Journal of Gambling Studies 15 (3): 223-232.

Gerson, E. M. 1983. "Scientific Work and Social Worlds," Knowledge 4: 357-379.

Gerstein, D. R., R. A. Volberg, R. Harwood, E. M. Christiansen et al. 1999. Gambling Impact and Behavior Study: Report to the National Gambling Impact Study Commission. Chicago, IL: National Opinion Research Center at the University of Chicago.

GLS Research. 1998. 1997/1998 Clark County Residents Study: Survey of Leisure Activities and Gaming Behavior. Report to the Las Vegas Convention and Visitors Authority.

Henslin, J. 1967. "Craps and Magic," American Journal of Sociology, 73: 316-330.

Hraba, J. & G. Lee. 1996. "Gender, Gambling and Problem Gambling," Journal of Gambling Studies 12 (1): 83-101.

Kallick, M., Suits, D. Dielman, T. & J. Hybels. 1976. Survey of American Gambling Attitudes and Behavior: Final Report to the Commission on the Review of the National Policy Toward Gambling. Research Report Series, Survey Research Center, Institute for Social Research. Ann Arbor: University of Michigan Press.

Kish, L. 1965. Survey Sampling. New York, NY: Wiley.

Korn, D. A. & H. J. Shaffer. 1999. "Gambling and the Health of the Public: Adopting a Public Health Perspective," Journal of Gambling Studies 15 (4): 289-365.

Lamatsch, T. Email communication from Thomas Lamatsch, Director of the Cannon Center for Survey Research, University of Nevada, Las Vegas. January 16, 2001.

Lesieur, H. R. 1994. "Epidemiological Surveys of Pathological Gambling: Critique and Suggestions for Modification," Journal of Gambling Studies 10 (4): 385-398.

Lesieur, H. R. 1998. "Costs and Treatment of Pathological Gambling," Annals of the American Academy of Political and Social Science 556: 153-171.

Lesieur, H. R. & S. B. Blume. 1987. "The South Oaks Gambling Screen (SOGS): A New Instrument for the Identification of Pathological Gamblers," American Journal of Psychiatry 144: 1184-1188.

Lesieur, H. R. & R. Klein. 1985. Prisoners, Gambling and Crime. Paper presented at the Meetings of the Academy of Criminal Justice Scientists.

Lesieur, H. R. & R. J. Rosenthal. 1991. "Pathological Gambling: A Review of the Literature (prepared for the American Psychiatric Association Task Force on DSM-IV Committee on Disorders of Impulse Control Not Elsewhere Classified)," Journal of Gambling Studies 7: 5-40.

Lesieur, H. R., S. B. Blume & R. M. Zoppa. 1986. "Alcoholism, Drug Abuse, and Gambling," Alcoholism: Clinical and Experimental Research 10: 33-38.

Light, I. 1977. "Numbers Gambling Among Blacks: A Financial Institution," American Sociological Review 42: 892-904.

Litwin, M. S. 1995. How to Measure Survey Reliability and Validity. Thousand Oaks: Sage Publications.

McQueen, P. A. 1999. "North American Gaming at a Glance," International Gaming & Wagering Business 20 (9): 40-46.

Mok, W. P. & J. Hraba. 1993. "Age and Gambling Behavior: A Declining and Shifting Pattern of Participation." In Gambling Behavior and Problem Gambling. W. R. Eadington & J. A. Cornelius (eds). Reno: University of Nevada Press. (Pp. 51-74).

National Gambling Impact Study Commission. 1999. Final Report. Washington, DC: Government Printing Office. Available at www.ngisc.gov.

Peda, C. Email communication from Cathy Peda, Survey Director, Gilmore Research Group, Seattle, WA. November 29, 2000

Porter, T. M. 1995. Trust in Numbers: The Pursuit of Objectivity in Science and Public Life. Princeton, NJ: Princeton University Press.

Preston, F. W., R. Gazel & B. J. Bernhard. 1996. Not Leaving Las Vegas: A Survey of Those Who Live and Work There. Paper presented at the 10th National Conference on Problem Gambling. Chicago, IL.

Preston, F. W., B. J. Bernhard, R. E. Hunter & S. L. Bybee. 1998. "Gambling as Stigmatized Behavior: Regional Relabeling and the Law," Annals of the American Academy of Political and Social Science 556: 186-196.

Prewitt, K. 1986. "Public Statistics and Democratic Politics." In N. J. Smelser & D. R. Gerstein (eds), Behavioral and Social Science: Fifty Years of Discovery. Washington, D.C.: National Academy Press. (Pp. 113-128).

Productivity Commission. 1999. Australia's Gambling Industries, Report No. 10. Canberra: AusInfo. Available at www.indcom.gov.au/inquiry/gambling/finalreport.

Rönnberg, S., R. A. Volberg, M. W. Abbott & I. M. Munck, et al. 1999. Gambling and Problem Gambling in Sweden. Stockholm: National Institute of Public Health.

Rose, I. N. 1986. Gambling and the Law. Hollywood, CA: Gambling Times, Inc.

Shaffer, H. J., M. N. Hall & J. Vander Bilt. 1997. Estimating the Prevalence of Disordered Gambling Behavior in the United States and Canada: A Meta-analysis. Boston: Harvard Medical School, Division on Addictions.

Shaffer, H. J., M. N. Hall & J. Vander Bilt. 1999. "Estimating the Prevalence of Disordered Gambling Behavior in the United States and Canada: A Research Synthesis," American Journal of Public Health 89 (9): 1369-1376.

Shaffer, H. J., J. Vander Bilt & Hall, M. N. 1999. "Gambling, Drinking, Smoking and Other Health Risk Activities among Casino Employees," American Journal of Behavioral Medicine 36: 365-378.

Shaffer, H. J., R. LaBrie, K. M. Scanlan & T. N. Cummings. 1994. "Pathological Gambling Among Adolescents: Massachusetts Gambling Screen (MAGS)," Journal of Gambling Studies 10 (4): 339-362.

Smith, D. A. R. 1993. "Treatment Services for Pathological Gambling: A Mental Health Perspective." In New Zealand Department of Internal Affairs, Papers from the Problem Gambling Seminar. Wellington: Department of Internal Affairs. (Pp. 85-90).

Sproston, K., R. Erens & J. Orford. 2000. Gambling Behaviour in Britain: Results from the British Gambling Prevalence Survey. London: National Centre for Social Research.

Stinchfield, R. 1997. Reliability, Validity and Classification Accuracy of the South Oaks Gambling Screen (SOGS). Paper presented at the 10th International Conference on Gambling and Risk Taking. Montreal, CANADA.

Strachan, M. L. & R. L. Custer. 1993. "Female Compulsive Gamblers in Las Vegas." In Gambling Behavior and Problem Gambling. W. R. Eadington & J. A. Cornelius (eds). (Pp. 235-238). Reno: Institute for the Study of Gambling and Commercial Gaming.

Tekniepe, R. J. 1997. Prevalence of Problematic Gambling Behavior: An Exploratory Study of the Low Income Population of Las Vegas, NV. Unpublished Masters Thesis, University of Nevada, Las Vegas.

U.S. Bureau of the Census. 2001. 2000 Census. Available at www.census.gov/main.

Volberg, R. A. 1992. Gambling Involvement and Problem Gambling in Montana. Report to the Montana Department of Corrections and Human Services.

Volberg, R. A. 1994. "Assessing Problem and Pathological Gambling in the General Population: A Methodological Review." In Gambling in Canada: The Bottom Line, C. S. Campbell (ed). Vancouver: Simon Fraser University Press. (Pp. 137-146).

Volberg, R. A. 1996. "Prevalence Studies of Problem Gambling in the United States," Journal of Gambling Studies 12 (2): 111-128.

Volberg, R. A. 1997. Gambling and Problem Gambling in Oregon. Report to the Oregon Gambling Addiction Treatment Foundation.

Volberg, R. A. 2001a. When the Chips Are Down: Problem Gambling in America. New York, NY: The Century Foundation.

Volberg, R. A. 2001b. Gambling and Problem Gambling in North Dakota: A Replication Study, 1992 to 2000. Bismarck, ND: Office of the Governor.

Volberg, R. A. 2002. Gambling and Problem Gambling Among Adolescents in Nevada. Carson City, NV: Department of Human Resources.

Volberg, R. A. & S. M. Banks. 1990. "A Review of Two Measures of Pathological Gambling in the United States," Journal of Gambling Behavior 6(2): 153-163.

Volberg, R. A. & E. Silver. 1993. Gambling and Problem Gambling in North Dakota. Report to the North Dakota Department of Human Services.

Volberg, R. A. & H. J. Steadman. 1988. "Refining Prevalence Estimates of Pathological Gambling," American Journal of Psychiatry 145: 502-505.

Volberg, R. A. & H. J. Steadman. 1992. "Accurately Depicting Pathological Gamblers: Policy and Treatment Implications," Journal of Gambling Studies 8 (4): 401-412.

Volberg, R. A., M. T. Toce & D. R. Gerstein. 1999. “From Back Room to Living Room: Changing Attitudes Toward Gambling,” Public Perspective 10 (5): 8-13.

Volberg, R. A., M. W. Abbott, S. Rönnberg & I. M. Munck. 2001. “Prevalence and Risks of Pathological Gambling in Sweden,” Acta Psychiatrica Scandinavica 104 (4): 250-256.

Walker, M. B. 1992. The Psychology of Gambling. Oxford: Pergamon Press.

Walker, M. B. & M. G. Dickerson. 1996. “The Prevalence of Problem and Pathological Gambling: A Critical Analysis,” Journal of Gambling Studies 12 (2): 233-249.

Winters, K. C., S. Specker & R. Stinchfield. 1997. Brief Manual for Use of the Diagnostic Interview for Gambling Severity. Minneapolis, MN: University of Minnesota Medical School. (July 1997).

Zola, I. K. 1964. "Observations on Gambling in a Lower-Class Setting," in The Other Side: Perspectives on Deviance, H. S. Becker (ed.), 247-260. New York: Free Press.

APPENDIX A

Methods to Assess Problem Gambling in the General Population

The tools used to generate numbers are always a reflection of the work that researchers and others are doing to identify and describe the phenomena in which they are interested (Alonso & Starr, 1987; Gerson, 1983; Prewitt, 1986). Historically, standardized measures and indices have often emerged in situations where there is, simultaneously, intense distrust and a perceived need for public action (Porter, 1995). Examples include the emergence of measures of "public utility" in France in the mid-1800s and the development of cost-benefit analysis in the United States in the mid-1900s.

There have been three "generations" of psychiatric research since the turn of the century. The third, and latest, generation of studies began around 1980 and coincided, as did the first two generations, with dramatic changes in psychiatric nomenclature (Dohrenwend, 1998). The publication of the third edition of the *Diagnostic and Statistical Manual* (DSM-III) (American Psychiatric Association, 1980), with its systematic approach to psychiatric diagnoses, led directly to the development of semi-structured interviews and rating examinations for use by clinicians. These tools were quickly adopted for epidemiological research despite the relative lack of research on the validity of these case identification procedures with general population samples (Dohrenwend, 1995).

The Social Construction of Problem Gambling Measures

With the rapid expansion of legal gambling in the 1980s, state governments began to establish services for individuals with gambling problems. In establishing these services, policy makers and program planners quickly sought answers to questions about the number of "pathological gamblers" in the general population who might seek help for their difficulties. These questions required epidemiological research to identify the number (or "cases") of pathological gamblers, ascertain the demographic characteristics of these individuals, and determine the likelihood that they would utilize treatment services if these became available.

Following the inclusion of the diagnosis of pathological gambling in the DSM-III for the first time in 1980 (American Psychiatric Association, 1980), a few researchers from a variety of scientific disciplines, including psychiatry, psychology, and sociology, began to investigate gambling-related difficulties using various methods from psychiatric epidemiology. At this time, few tools existed to measure gambling-related difficulties. The only tool that had been rigorously developed and tested for its performance was the South Oaks Gambling Screen (SOGS).

The SOGS, closely based on the new diagnostic criteria for pathological gambling, was originally developed to screen for gambling problems in clinical populations (Lesieur & Blume, 1987). The 20 weighted items on the SOGS include hiding evidence of gambling, spending more time or money gambling than intended, arguing with family members over gambling and borrowing money from a variety of sources to gamble or to pay gambling debts. In developing the SOGS, specific items as well as the entire screen were tested for reliability and validity with a variety of groups, including hospital workers, university students, prison inmates and inpatients in alcohol and substance abuse treatment programs (Lesieur & Blume, 1987; Lesieur, Blume & Zoppa 1986; Lesieur & Klein 1985).

Adopting the SOGS for Population Research

Like other tools in psychiatric research, the SOGS was quickly adopted in clinical settings as well as in epidemiological research. The SOGS was first used in a prevalence survey in New York State (Volberg & Steadman, 1988). By 1998, the SOGS had been used in population-based research in more than 45 jurisdictions in the United States, Canada, Asia and Europe (Abbott & Volberg, 2000; Bondolfi, Osiek & Ferrero, 2000; Gerstein et al, 1999; Productivity Commission, 1999; Shaffer, Hall & Vander Bilt, 1999; Sproston, Erens & Orford, 2000; Volberg et al, 2001). This widespread use of the SOGS came at least partly from the great advantage of comparability within and across jurisdictions that came with use of a standard tool (Walker & Dickerson, 1996). Although there were increasingly well-focused grounds for concern about the performance of the SOGS in non-clinical environments, this tool remained the *de facto* standard in the field until the mid-1990s, when the new DSM-IV criteria were published (American Psychiatric Association, 1994; Volberg & Banks, 1990).

Like all tools to detect physical and psychological maladies, screens to detect gambling problems can be expected to generate some errors in classification. However, misclassification has very different consequences in different settings. Misclassification can occur when an individual without the malady in question is misdiagnosed as having the malady. This type of classification error is called a false positive. Misclassification can also occur when an individual with the malady is misdiagnosed as not having the malady. This type of classification error is called a false negative (see table below). While most screens to detect psychiatric disorders work well in clinical settings where the prevalence of the disorders under investigation is predictably high, the accuracy of many psychiatric screens declines when they are used among populations where prevalence is much lower, such as the general population (Dohrenwend, 1995).

Classification	Condition	
	Pathological	Non-Pathological
Pathological	True Positive	False Positive
Non-Pathological	False Negative	True Negative

Clinicians are concerned with the issue of false positives because the cost of treating someone who does not need treatment is extremely high. Clinicians are also concerned with false negatives because of the enormous impact associated with failure to correctly diagnose an individual with a disorder. In population research, where the primary concern is accurately identifying the number of people with and without the disorder, both types of classification error are important, but for different reasons. In population research, each type of classification error has an independent impact on the overall efficiency of the screen. Indeed, the rate of false negatives may be of principal concern in population research since even a very low rate of false negatives can have a large effect on the overall efficiency of a screen (i.e. the total proportion of individuals who are correctly classified).

Take as an example a group of 1,000 individuals of whom 5% are classified as pathological and 95% are classified as non-pathological. Let us assume that the rate of false positives is 50% so that 25 of the 50 identified pathological gamblers are misclassified. Even if the rate of false negatives were much lower, say 5%, 47 of the 950 non-pathological gamblers would be misclassified. Thus, even a very low rate of false negatives will generate a group that is nearly twice as large as the group of false positives (see table below).

	Pathological	Non-Pathological	Total
Pathological	25	25	50
Non-Pathological	47	903	950
Total	72	928	1,000

Validating the SOGS

A national study in New Zealand in the early 1990s furnished an opportunity to examine the performance of the South Oaks Gambling Screen in the general population (Abbott & Volberg, 1992, 1996). This opportunity arose from the two-phase research design employed in the New Zealand study. This design allowed the researchers to identify true pathological gamblers among particular groups of respondents. In the New Zealand study, true pathological gamblers were identified in each of four groups included in the survey: (1) probable pathological gamblers, (2) problem gamblers, (3) regular continuous gamblers and (4) regular non-continuous gamblers. No error rate was determined for respondents in the New Zealand study who did not acknowledge gambling on a regular basis. Prevalence rates were corrected using the "efficiency approach" which involved calculating the rate of true pathological gamblers in each group and dividing this number by the total number of respondents in the sample. The efficiency approach resulted in a revised current prevalence estimate in New Zealand that was 0.1% higher than the uncorrected current prevalence rate.

This revised estimate in New Zealand rested on the conservative assumption that there were no false negatives among individuals who did not gamble regularly. While the error rates in each of the four groups have an impact on the overall prevalence rate, the size of the error rate for each group has a different impact because of the different sizes of these groups in the population. Even if the number of false negatives in the non-pathological group or among respondents who do not gamble regularly were extremely small, the relatively large size of these groups contributes to a noticeably higher overall prevalence rate. For example, if the large proportion of the population that gambles on a less than weekly basis is assumed to include a very small number of pathological gamblers (1%), the prevalence estimate increases by 0.7%.

The New Zealand researchers concluded that the lifetime South Oaks Gambling Screen is very good at detecting pathological gambling among those who currently experience the disorder. However, as expected, the screen identifies at-risk individuals at the expense of

generating a substantial number of false positives. The current South Oaks Gambling Screen produces fewer false positives than the lifetime measure but more false negatives and thus provides a weaker screen for identifying pathological gamblers in the clinical sense. However, the greater efficiency of the current South Oaks Gambling Screen makes it a more useful tool for detecting rates of change in the prevalence of problem and pathological gambling over time (Abbott & Volberg, 1996).

Although there are questions about the validity of applying results from research in New Zealand to studies in the United States, the New Zealand research does suggest that estimates of the lifetime prevalence of problem and probable pathological gambling over-state the actual prevalence of pathological gambling. However, since the lifetime South Oaks Gambling Screen does a good job of identifying pathological gamblers in the general population, information about the characteristics of these respondents is valuable in planning the implementation and development of services for pathological gamblers in the community. The New Zealand research further suggests that estimates of the current prevalence of problem and probable pathological gambling are quite accurate.

A recent study in Minnesota supports the New Zealand work on the performance of the SOGS (Stinchfield, 1997). In the Minnesota research, the SOGS and a nineteen-item version of the DSM-IV criteria (the DIGS—Diagnostic Interview for Gambling Severity) were administered to three samples, including a general population sample, a sample of callers to a gambling hotline and a sample of individuals entering treatment for a gambling problem. As in New Zealand, Stinchfield found that the accuracy of the SOGS (as assessed by the DIGS) was high among individuals who called a gambling hotline or were entering treatment but that the instrument did not perform as well in the general population. Stinchfield concluded that the SOGS had satisfactory reliability and validity in all three samples. However, he argued that the SOGS is best suited for identifying individuals at risk while the DIGS is more useful if the goal of a study is to estimate the prevalence of pathological gambling in the general population.

Growing Concerns with the SOGS

Beginning in the early 1990s, a variety of methodological questions were raised about SOGS-based research in the general population (Culleton, 1989; Dickerson, 1993b; Lesieur, 1994; Volberg, 1994; Walker, 1992). Some of these issues, such as respondent denial and rising refusal rates, were common to all survey research. Other questions were related to the issue of how to best study gambling-related difficulties. These included reservations about the reliability and validity of the SOGS as well as challenges to assumptions about the nature of gambling problems that were built into the original version of this instrument.

What led to the growing dissatisfaction with the South Oaks Gambling Screen? One important change was the rapid expansion of legal gambling itself. This expansion led many people who had never before gambled to try these activities. As legal gambling expanded into new markets and as new types of gambling were marketed to new groups, the individuals seeking help for gambling difficulties became increasingly heterogeneous. Representatives of the gambling industries also played a role in challenging the supremacy of the South Oaks Gambling Screen through their efforts to discredit what they saw as unacceptably high prevalence rates.

Prevalence surveys in the early 1990s suggested that growing numbers of women and middle-class individuals were developing gambling problems (Volberg, 1992, 1996; Volberg & Silver, 1993). Several of the specific items included in the SOGS made little sense to these new groups or to the treatment professionals working with them. Questions about borrowing from loansharks, for example, or cashing in stocks and bonds to get money to gamble or pay gambling debts were more relevant to the middle-aged, middle-class men most likely to seek help for gambling problems in the 1970s and early 1980s than to the young adults and middle-aged women who began to experience gambling problems in the 1990s. Questions about others criticizing one's gambling and feeling guilty about one's gambling were more likely to receive a positive response from low-income and minority respondents than others in the population (Volberg & Steadman, 1992). Questions about borrowing from the "household" to get money to gamble would be interpreted differently by individuals from ethnic groups where "household" may be defined as the entire extended family.

There were also multiplying needs for tools in different settings. Starting in the early 1990s, growing government resources became available for services for problem gamblers. In 1985, only three states funded services for problem gamblers. By 1996, 21 states were funding an array of services for problem gamblers, including education, prevention, and referral; an increase of 600 percent in ten years (Cox et al, 1997). Along with these resources came new demands for accountability and performance. These demands drew further attention to the deficiencies of the South Oaks Gambling Screen and increased dissatisfaction with its performance in general population studies.

Emergence of New Problem Gambling Screens

In 1994, the fourth edition of the *Diagnostic and Statistical Manual* (DSM-IV) adopted a new set of criteria for the diagnosis of pathological gambling. The changes made to the psychiatric criteria for pathological gambling incorporated empirical research that linked pathological gambling to other addictive disorders like alcohol and drug dependence (American Psychiatric Association, 1994). In developing the DSM-IV criteria, 222 self-identified pathological gamblers and 104 substance abusers who gambled socially tested the individual items (Lesieur & Rosenthal, 1991). Discriminant analysis was used to identify the items that best differentiated between pathological and non-pathological gamblers. While the results from this sample indicated that a cutoff of 4 points was appropriate, the American Psychiatric Association established a diagnostic cutoff of 5 points. Pathological gambling is now defined as persistent and recurrent maladaptive gambling behavior as indicated by five or more of ten criteria (listed in Table 1 on Page 2 of this report), with the reservation that the behavior is not better accounted for by manic episodes—a reservation added somewhat as an afterthought, as it was not part of the underlying research on which the DSM-IV criteria were based.

Most researchers conducting gambling studies and treatment professionals working with individuals with gambling problems have expressed satisfaction with the new DSM-IV criteria. Internationally, numerous researchers and treatment professionals have adopted the DSM-IV criteria in their work and these criteria are now the measure against which the performance of other instruments must be demonstrated.

There is a growing community of researchers and treatment professionals active in the gambling field and a growing number of tools to measure gambling problems for different purposes. Until 1990, only three screens existed to identify individuals with gambling

problems, including the ISR screen used in the last national study; the CCSM; and the SOGS (Culleton, 1989; Kallick et al, 1976; Lesieur & Blume, 1987). Since 1990, nine screens for adults and three screens for adolescents have been developed, including two based on the SOGS and at least four based on the DSM-IV criteria. Despite this proliferation, the psychometric properties of most of these new tools remain unexamined. Even more significantly, few of these new screens have been tested for their differential performance in clinical settings, population research, and program evaluation. Another concern is how to calibrate the performance of these new screens with the results of more than a decade of SOGS-based research.

The 1998 National Survey

In 1998, the National Gambling Impact Study Commission contracted with the National Opinion Research Center to collect data from a nationally representative sample of households about gambling behavior and gambling-related problems.[1] This was the first national survey of gambling behavior conducted since 1975. The questionnaire for the national survey supplemented demographic and geographic information with economic and family indicators. Respondents were asked highly detailed questions about their gambling behavior and about adverse consequences related to gambling. Respondents were also asked questions about their physical and mental health, about alcohol and substance use and dependence and about criminal records.

The guidelines of the National Gambling Impact Study Commission specified that the DSM-IV criteria be used to identify respondents with gambling-related difficulties in the general population. This meant that the study team could not use the South Oaks Gambling Screen since this is based on the DSM-III criteria. Instead, the study team developed a series of questions designed to match the DSM-IV criteria for diagnosing pathological gambling. This series of questions is referred to as the NODS (the National Opinion Research Center DSM Screen for Gambling Problems).

Development of the NODS

The NODS is composed of 17 lifetime items and 17 past year items, compared to the 20 lifetime items and 20 past year items that make up the South Oaks Gambling Screen. The maximum score on the NODS is 10 compared to 20 for the South Oaks Gambling Screen. Although there are fewer items in the NODS, and the maximum score is lower, the NODS is actually more restrictive in assessing problematic behaviors than the SOGS or any other screen based on the DSM-IV criteria.

For example, several of the DSM-IV criteria are difficult to establish with a single question. In assessing these criteria (Preoccupation, Escape, Risking a Significant Relationship), two or three questions were used with respondents receiving a single point if they give a positive response to any of the questions assessing that criterion. Another complication in constructing the NODS is that two of the DSM-IV criteria (Withdrawal, Loss of Control) assume that the questioner already knows that the individual has tried to “stop, cut down, or control” her or his gambling. These criteria

[1] The National Opinion Research Center formed a study team that included Gemini Research, Ltd., the Lewin Group and Christiansen/Cummings Associates, Inc. In addition to the survey of 2406 adults, research initiatives included a national survey of 534 youths aged 16 and 17, intercept interviews with 530 adult patrons of gaming facilities, a longitudinal data base (1980 to 1996) of social and economic indicators and estimated gambling revenues in a random national sample of 100 communities and case studies in 10 communities regarding the effects of large-scale casinos opening in close proximity.

were assessed with the NODS by first determining whether the respondent had tried to control her or his gambling before assessing whether the respondent had felt restless or irritable during these times (Withdrawal) and, then, assessing whether the respondent had succeeded in doing so (Loss of Control).

Another decision in developing the NODS was to place definite limits on several of the criteria, in keeping with the approach taken in alcohol and drug abuse research. For example, in assessing Preoccupation, the NODS asks if the periods when respondents spent a lot of time thinking about gambling or about getting money to gamble have lasted 2 weeks or longer. Similarly, the NODS asks if respondents have tried, but not succeeded, in controlling their gambling three or more times (Loss of Control). Respondents are also asked if they have lied to others about their gambling three or more times (Lying). Only a positive response to these latter items are included in the final score for the NODS.

In the national survey, NORC chose to administer the NODS only to those respondents who acknowledged ever losing $100 or more in a single day of gambling and/or those who acknowledged that they had been behind at least $100 across an entire year of gambling at some point in their lives. This decision was made after pretesting indicated that non-gamblers and infrequent gamblers grew impatient with repeated questions about gambling problems and after a review of other problem gambling surveys showed that persons who had never experienced significant losses were unlikely to report problems related to gambling. Further research is needed to determine whether the use of these filters in other problem gambling studies is warranted.

Validity and Reliability of the NODS

In the study of clinical disorders, pathological gambling counts as a chronic rather than as an acute disorder. Once fully developed, chronic disorders leave a lifelong vulnerability. This vulnerability may be effectively treated and kept in check. However, periods when an individual is relatively free of symptoms do not mean that the person is free of the disorder. From the perspective of measuring prevalence, the strongest emphasis belongs on the determination of whether pathological gambling has developed rather than on whether its symptoms are recent or current. This is clearly reflected in the DSM-IV criteria, which focus on the accumulation of discrete symptoms through the present and do not require that specific symptoms be clustered tightly together in time.

As noted above, research on the performance of the SOGS has shown that the lifetime screen is very good at detecting pathological gambling among those who currently experience the disorder. However, the lifetime SOGS accurately identifies at-risk individuals at the expense of generating higher numbers of false positives. Based on the construction of the NODS as well as the results from the national survey, the research team argued that the specificity of the NODS should be very good, reducing the rate of false positives among those classified with the lifetime screen; and in this respect, contrasting with the performance of the SOGS.

One important step in developing the NODS was a field test with a national clinical sample of 40 individuals in outpatient problem gambling treatment programs. Based on the field test, the research team concluded that the NODS had strong internal consistency, retest reliability and good validity. The field test demonstrated that the sensitivity of the lifetime NODS in a clinical population was higher than the past year

NODS. This is what one would expect if pathological gambling is appropriately conceptualized as a chronic disorder.

Assessing Problem Gambling in the Future

The assumption underlying all of the existing gambling research is that gambling-related difficulties are a robust phenomenon that exist in the community and can be measured. Despite agreement among researchers and treatment professionals at this fundamental level, there is disagreement about the concepts and measurement of gambling-related difficulties. While the ascription of "conceptual and methodological chaos" to the field (Shaffer, Hall & Vander Bilt, 1997: 8) may be an overstatement of the situation among its experienced researchers, the presence of competing concepts and methods is not uncommon among emerging and even mature scientific fields. Nevertheless disputes among experts have led to some degree of public confusion and uncertainty about the prevalence of problem gambling and the impacts of legal gambling on society.

Like much of science, measurement is a negotiable process. Instrumentation is always a reflection of the work that researchers are doing to identify and describe the phenomena in which they are interested. Each of the methods used to classify problem gamblers represents a culturally and historically situated consensus about the nature of problem gambling. As research continues and as the definitions of problem gambling change, new instruments and new methods for estimating prevalence in the general population and for testing models of gambling behavior will continue to emerge. To advance the field of gambling studies in an orderly manner, these emerging methods must be tested against each other and against existing tools, such as the South Oaks Gambling Screen. This approach will serve to ensure the relevance of our past work as well as our work in the future.

APPENDIX B

Constructing the Weights for the Nevada Survey

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1_Sampling and weighting overview. The sample is a "two-phase probability sample (Kish, 1965, Chap. 12), also called a "double sample" (Cochran, 1963, Chap. 12), of adult members of households with telephones located in Nevada. The first phase involved the selection of residential households with telephones in Nevada and the selection of one eligible adult aged 18 or older from each selected household to respond to the screener or "short form". The second phase involved the selection of phase-1 respondents for the full-length interview ("long form"). Sampling for the long form was restricted to individuals who reported past-year gambling with higher selection probabilities for past-week gamblers.

Short-form respondents are defined as all sample members on file with nonmissing data for the variable STATUS: 1=never gambled, 2=lifetime gambler, 3=past-year gambler, and 4=weekly gambler. We define long-form respondents as those who responded 3 or 4 to STATUS and also had nonmissing data for at least one of three long-form questionnaire modules, i.e., a response of 1, 2, or 3 on the variable SURVEY. Based on these definitions, the number of short-form respondents equals 2,217, and the number of long-form respondents equals 733. NVREAD.LST available from Gemini Research shows frequency distributions of STATUS, SURVEY, FORM (1=short form only; 2=long form), and other variables used in the weighting.

For each sample, we supplemented the survey data with 2000 census counts for Nevada– available at www.census.gov – and applied standard post-stratification weighting techniques (Cochran, 1963; Kish, 1965).

2_*Weighting cells*. Phase-1 and phase-2 post-stratification weights were computed separately within 20 "weighting cells"- i.e., sample subclasses- which were defined based on the cross classification of three variables:

REGION: 1= Clarke County
2= Washoe County, Douglas County, or Carson City
3= all other Nevada counties

GENDER: 1= male
2 = female

AGEGROUP: 1824= 18-to-24 years old
2534= 25-to-34 years old
3544= 35-to-44 years old
4554= 45-to-54 years old
5564= 55-to-64 years old
6598= 65 and older

The 20 weighting cells were defined as cells of the cross classification of these three variables with the exceptions that age groups 1824, 2534, and 3544 and age groups 4554, 5564, and 6598 were combined in each of regions 2 and 3 to obtain sufficiently large sample sizes within cells to accurately calculate the weights. NVPREP.LST available from Gemini Research shows the sample sizes of the 20 weighting cells for each of phase 1 and phase 2.

3_*Calculation of weights*. Separately within each of the 20 weighting cells, we calculated the phase-1 weight ("WTSHORT") by (a) dividing the number of short-form respondents by the corresponding number of adults in the same subclass of the Nevada population, and (b) taking the reciprocal (inverse) of the resulting ratio. Separately within each of the 20 weighting cells, we calculated the long-form weight ("WTLONG") as the product of two factors: (a) the phase-1 weight ("WTSHORT") and (b) the "phase-2 factor," a factor which adjusts for the unequal probabilities of selecting short form respondents for the long form and for the unequal long-form completion rates of individuals of different regions, ages, and genders. WTLONG also equals the population size of the weighting cell divided by the number of long-form respondents. NVWEIGHT.LST available from Gemini Research shows – separately for phases 1 and 2 – the population and sample sizes of weighting cells and the corresponding (unstandardized) weights.

In the case of WTSHORT, we also imputed weights to 141 short-form respondents (NVCHECK.LST available from Gemini Research) who had missing data on one or more of the three weighting variables and thus could not be assigned to one of the 20 weighting cells. For each of these 141 respondents, we imputed the mean short-form weight of respondents with the same value(s) of the nonmissing weighting variable(s). These values are documented in NVWEIGHT.LST available from Gemini Research.

WTLONG takes on missing values (coded as ".") for all sample members who did not complete the long form. WTSHORT takes on missing values only for 7 of the total 2,224 sample members who had missing data on STATUS.

4_*SPSS weighted file*. To use the weights in analysis, the data file supplied to Gemini Research by CCSR was merged with the SPSS file "NVWTS.SAV". NVWTS.SAV contains three weights – WTSHORT, WTSHORT2, and WTLONG. WTSHORT and WTSHORT2 differ only because the former is standardized to sum to the short form sample size, i.e., n = 2,217, whereas the latter is standardized to sum to the population size of adults age 18 and older in Nevada, i.e., N = 1,486,458 according to Census 2000. WTLONG is standardized to sum to the long form sample size, i.e., n = 733.

5_ Descriptive statistics. "NVIMPUTE.LST" available from Gemini Research presents descriptive statistics for the three weights: WTSHORT, WTSHORT2, and WTLONG. Each weight is only mildly positively skew and the coefficients of variation (standard deviation divided by mean) are moderate in magnitude. These results suggest that weighted analyses should yield results only modestly less precise than otherwise equivalent unweighted analyses.

6_ Implementation of weights in analysis. WTSHORT should be used in most analyses of the short- form data. WTLONG should be used in analyses of the long-form data. These two weights are scaled to sum to total respondents, so they should yield accurate standard errors of analytical statistics and confidence intervals for estimated parameters, when applied using the WEIGHT subcommands of programs like SPSS or SAS. Most analytical purposes will be well served by using these weights. Exceptions would be analyses estimating the total number of Nevada adults with specified attributes. For the latter purposes, WTSHORT2 should be used.