Chapter 3: Pathological And Problem Gamblers In The United States

The perception of increased pathological and problem gambling is currently driving interest and concern among policymakers, treatment professionals, industry officials, gambling researchers, and the public. Data describing the extent of pathological and problem gambling are useful for many purposes, including planning public health services and medical services. This chapter discusses the prevalence of pathological and problem gamblers among the general U.S. population and specific subpopulations. As limited by the available data, the discussion is often framed in terms of the proportion of pathological and problem gamblers reported in studies of U.S. residents. Of particular concern is determining prevalence among reportedly vulnerable demographic groups, such as men, adolescents, the poor, the elderly, and minorities (including American Indians). We also attempt to examine trends in relation to the increased availability of legal gambling opportunities in the last decade. This chapter also makes comparisons with the prevalence rates of alcohol and drug abusers, to help put the magnitude of excessive gambling and related problems into perspective.

LIMITATIONS OF PREVALENCE RESEARCH

In Chapter 2 we described the difficulties involved in defining and measuring pathological gambling using various assessment instruments. Here it is important to note that comparing and interpreting prevalence findings is problematic when different studies use different screening and/or diagnostic instruments or criterion levels to measure differing levels of intemperate gambling and associated problems. Unfortunately, such differences are common in the research literature on pathological and problem gambling (Volberg, 1998b) which creates problems in estimating prevalence rates in the United States.

Another important limitation of the available prevalence research pertains to the different facets of the concept of prevalence. A prevalence estimate requires specification of the population or geographical area represented and the time frame over which prevalence is defined (Walker and Dickerson, 1996). Most of the prevalence research on pathological and problem gambling is specific about the population or area represented, but the time frames within which gambling behavior is assessed vary widely. This variation is troublesome because the information of greatest policy relevance is generally the prevalence of current pathological or problem gambling, that is, estimates over a relatively recent but behaviorally representative time frame (e.g., the past year). The time frame most common in available research, however, is lifetime. Thus, many of those who are counted in prevalence research as being pathological or problem gamblers may have met screening or diagnostic criteria at some point during their lives, but did not manifest gambling problems at the time of the study.

Measuring pathological and problem gambling also requires distinguishing incidence from prevalence: incidence is the number of new cases arising in a given time period, and prevalence is the average total number of cases during a given time period, factoring in new cases and deleting cases representing cures and deaths. Incidence is especially pertinent to policy questions involving the effects of increased gambling opportunities and changes in technology, industry practices, and regulation. There is almost no research that examines the incidence of pathological or problem gambling cases over a representative, recent time period.[1] Nor are there

[1] The one notable exception is the Epidemiologic Catchment Area (ECA) Study (see Cunningham et al., 1996; Cunningham-Williams et al., 1998).

longitudinal studies that provide trend data for population cohorts or that track the progression of individuals into or out of the states of pathological or problem gambling. Finally, literature on pathological and problem gambling rarely distinguishes, in an epidemiological sense, the difference between rates of pathological and problem gambling and proportions of pathological and problem gamblers. This distinction is made throughout the chapter to the extent allowed by the data available to the committee.

DETERMINING NATIONAL PREVALENCE

Perhaps the most serious limitation of existing prevalence research is that the volume and scope of studies are not sufficient to provide solid estimates for the national and regional prevalence of pathological and problem gamblers, nor to provide estimates of changes in prevalence associated with expanded gambling opportunities and other recent secular trends. Only three studies have attempted to measure the prevalence of pathological or problem gambling in the United States for more than one or a few states. A national study was undertaken by the University of Michigan Survey Research Center in 1975 (Commission on the Review of the National Policy Toward Gambling, 1976; Kallick et al., 1979). At that time, illegal gambling was believed to be widespread, and the nation was facing the prospect of increased legalization of gambling. Accordingly, the survey concentrated on assessing American gambling practices and attitudes toward gambling. The scale that attempted to measure "compulsive gambling" was only one small component of the larger gambling survey (Commission on the Review of the National Policy Toward Gambling, 1976).

From the responses of 1,736 adults about behaviors over their lifetimes, "it was estimated that 0.77 percent of the national sample could be classified as 'probable' compulsive gamblers, with another 2.33 percent identified as 'potential' compulsive gamblers" (Commission on the Review of the National Policy Toward Gambling, 1976). A combined total of 3.10 percent of the population was therefore estimated to be probable or potential compulsive gamblers sometime during their lives. Although the findings of the survey were considered important, the researchers advised caution in interpreting the results because it was not clear that their measures could distinguish compulsive (i.e., pathological) gambling from other possible disorders (Commission on the Review of the National Policy Toward Gambling, 1976).

A second attempt to estimate the prevalence of pathological or problem gambling in the United States and Canada was the recent meta-analysis by Shaffer and colleagues (Shaffer et al., 1997) under a grant received from the National Center for Responsible Gaming. As opposed to original research, which involves collection of new data, meta-analytic research empirically integrates the findings of previously conducted independent studies. On the basis of predetermined criteria, Shaffer et al. selected 120 studies of gambling prevalence in various states and provinces of the United States and Canada for inclusion in the meta-analysis. These studies represented adults and youth in the general population, college students, adults and youth in treatment or prison settings, and a variety of other special populations.

To standardize the different terms used in the studies analyzed, Shaffer et al. (1997) defined four levels of gambling: Level 0 referred to nongamblers; Level 1 described social or recreational gamblers who did not experience gambling problems; Level 2 represented gamblers with less serious levels of gambling problems (problem gambling); and Level 3 represented pathological gambling.

This meta-analysis concluded that combined pathological and problem gambling--what

they termed disordered gambling--was a robust phenomenon, although the majority of Americans and Canadians gamble with little or no adverse consequences. The study found that lifetime prevalence rates among adults in the general population for both nations together were estimated at 1.60 percent for Level 3 gamblers and 5.45 percent for Levels 2 and 3 combined. Past-year prevalence rates were estimated at 1.14 percent for Level 3 gamblers and 3.94 percent for Levels 2 and 3 combined. Prevalence rates among youth and other special populations were found to be substantially higher (Shaffer et al., 1997).

As part of its review of the pathological gambling literature, the committee undertook an analysis of the Shaffer et al. meta-analysis data for 49 of the original 120 studies that were based on samples of the general population (not clinical or institutional) drawn from U.S. residents.[2] Of these 49, 20 were conducted during the past 10 years, all at the state level. Although these 20 surveys do not represent all states and territories within the United States, or any reasonable purposive sampling of them, they nonetheless provide the best recent information about the prevalence of pathological and problem gambling in the United States that is currently available. As described in more detail in the following sections, the median prevalence rates found in those studies were as follows:

- Lifetime prevalence rates: 1.5 percent for Level 3 gamblers and 5.4 percent for Levels 2 and 3 combined.

- Past-year prevalence rates: 0.9 percent for Level 3 gamblers and 2.9 percent for Levels 2 and 3 combined.

Most recently, a third national prevalence study was commissioned by the National Gambling Impact Study Commission. The study was conducted by the National Opinion Research Center (NORC) of the University of Chicago. Preliminary results, released while this report was in its final stages, estimated the lifetime prevalence rate of Type E (i.e., pathological) adult gamblers to be 0.9 percent. The past-year prevalence rate for Type E adult gamblers was estimated to be 0.6 percent (National Opinion Research Center, 1999). The NORC study estimates are discussed in more detail later in this chapter.

PATHOLOGICAL AND PROBLEM GAMBLERS IN THE U.S. ADULT POPULATION

Table 3-1 identifies the general population studies included in the Shaffer et al. (1997) meta-analysis that furnished gambling prevalence data for U.S. adult samples from 1975 to 1997 (exclusive of persons in treatment, prisoners, and other specialized groups).[3] The majority of these surveys were conducted at the state level in the past 10 years, but a few regional studies are also included. Table 3-1 also shows that a variety of survey instruments for identifying pathological and problem gamblers was used in these studies. However, the South Oaks Gambling Screen (SOGS) and its variants have dominated practice so completely that it has been

[2] A few state and regional surveys have been conducted since publication of the Shaffer et al. meta-analysis in December 1997, but they vary sufficiently in methods and coverage that meaningful comparison is difficult. No attempt, therefore, was made to include them in this analysis.

[3] The meta-analysis reference number for each study listed in Table 3-1 is the same used by Shaffer et al. (1997). All studies considered by the committee and used in tables in this chapter are listed in the chapter bibliography with the corresponding reference numbers.

the de facto standard operationalization of pathological and problem gambling for adult populations. As discussed in Chapter 2, the SOGS instrument has been criticized as a measure of pathological or problem gambling in the general population, chiefly because it was originally developed for use in clinical settings (Lesieur and Blume, 1987) and may produce a high rate of false positives (Culleton, 1989). In particular, there is some evidence that the threshold values for pathological and problem gambling generally applied to SOGS scores yield overestimates of prevalence relative to the results of classification using the criteria from the DSM (Shaffer et al., 1997; Volberg, 1998b).

Not shown in Table 3-1, but relevant to interpretation of the limited available prevalence research, are the uneven methodological characteristics of the prevalence studies. Response rate, for instance, varied from 36 to 98 percent, with a median of 68 percent. These prevalence studies were also inconsistent in their coverage of the gambling items. Some surveys asked all questions of all respondents, and others asked certain questions only of those who responded affirmatively to a prior question. (For example, if someone had never had financial problems from gambling, they might not be asked how much money they lost from gambling.) Finally, the data analysis in these studies consisted chiefly of frequency distributions and simple cross-tabulations, with little examination of missing data or other potentially biasing characteristics.

One useful approach for integrating information across studies of varying methodological quality is to use meta-analytic techniques to adjust for methodological differences, in an attempt to minimize any distortion in the cross-study mean that stems from those differences. For instance, Shaffer et al. coded nine items related to the quality of study methods and combined them into a composite methodological quality score. They found, however, that there was neither a statistically significant relationship between that score and reported prevalence rates nor meaningful differences between unweighted prevalence means and those weighted by methodological quality. In light of these findings and the relatively small number of recent U.S. studies pertinent to the committee's analysis, no attempt was made to develop adjustments for method differences among studies.

With the limitations of coverage and methodological quality in mind, the prevalence findings from the studies listed in Table 3-1 are discussed in the remaining portions of this section.

Gambling Activities

Rather high proportions of the adult populations in the states surveyed have participated in at least some gambling during their lives. Among the 20 surveys identified in Table 3-1 that were conducted in the past 10 years (i.e., 1988-1997), the percentage of respondents reporting lifetime participation in some form of gambling ranged from 64 to 96 percent, with a median of 87 percent. However, there was great variation across the years in which studies were conducted, across different types of gambling activities, and between states.

More indicative of the prevalence of currently active gamblers are the survey data for participation in gambling activities in the past year. Unfortunately, this information was less often collected than lifetime data. Eleven of the studies in Table 3-1 that were conducted in the past 10 years reported gambling during the prior year. The proportion of respondents in those studies who reported any type of gambling in the past year ranged from 49 to 88 percent, with a median of 72 percent. If this is representative, then approximately three-quarters of the adult population in the United States has participated in some form of gambling in any recent year.

Table 3-2 summarizes the information available from studies conducted in the past 10 years regarding the lifetime and past-year participation in various specific forms of gambling. These findings must be interpreted with some caution, since relatively few studies contributed to each category and the coverage and content of the surveys varied considerably. For example, illegal gambling showed the highest percentages of lifetime participation reported for any gambling activity (ranging from 56 percent in Mississippi to 65 percent in New York)--a curious finding given legalized forms of gambling in those states--but was reported in only two studies, both conducted in 1996. As Table 3-2 indicates, lottery gambling and illicit gambling were generally reported as having the highest proportions of respondents who have participated sometime during their lifetime. Following these are charitable games, casino gambling, pari-mutuel betting, sports betting, video lottery, and card games, all with rather similar participation rates. Games of skill and gambling in financial markets (i.e., speculating) had the lowest lifetime participation rates.

The more limited information from these surveys on past-year participation in specific types of gambling is similar to that for lifetime participation, but with lower proportions in all categories. Lottery participation was highest, with the lowest proportions found among games of skill, pari-mutuel betting, gambling in financial markets, and charitable games.

Pathological and Problem Gamblers

Table 3-3 summarizes the prevalence rates of Level 2 (problem) and Level 3 (pathological) gamblers identified in the general population surveys conducted during the past 10 years, virtually all of which were conducted at the state level. The lifetime prevalence of pathological gamblers (Level 3) across the 18 studies reporting that information ranged from 0.1 percent to 3.1 percent, with a median value of 1.5 percent. Estimates of combined lifetime problem and pathological gambler prevalence (Levels 2 and 3) ranged from 2.3 percent to 12.9 percent across 15 studies, with a median of 5.4 percent.

From a policy standpoint, the most relevant data are those reflecting pathological or problem gambling prevalence in the past year, that is, relatively recent activity. Percentages of past-year pathological and problem gamblers were reported in only 13 studies, all conducted between 1992 and 1996. All but one of these (New Mexico Department of Health, 1996) used the SOGS or a variant. The New Mexico data were based on a modified DSM-IV instrument and showed substantially higher rates for both problem and pathological gambling. If the New Mexico study is set aside as an outlier in the distribution, the remaining prevalence estimates cluster fairly closely. Problem gambling (Level 2) ranged from 0.7 to 3.4 percent (median = 2.2 percent); pathological gambling (Level 3) ranged from 0.5 to 2.1 percent (median = 0.9 percent); and combined pathological and problem gambling ranged from 1.2 to 4.9 percent (median = 2.9 percent).

It is possible to calculate the prevalence of pathological and problem gamblers *among those who gamble* by examining the rates for only those survey respondents who reported any gambling in the past year. The last two columns in Table 3-3 show these estimates.[4] Over the 10 samples for which such computations could be made, the proportion of pathological and

[4] These numbers represent the proportion of (a) past-year problem and pathological or (b) pathological gamblers, respectively, among only those who have gambled in the last year. The other numbers in Table 3-3 represent the proportions of problem and/or pathological gamblers among all respondents in the sample, whether or not they have gambled within the indicated time frame.

problem gamblers combined ranged from 2.7 percent in North Dakota to 10 percent in Mississippi. The 10 percent prevalence rate reported in Mississippi was notably higher than in other states. If it is set aside as a possible statistical outlier, a more conservative prevalence estimate results, ranging from 2.7 percent in North Dakota to 6.8 percent in Minnesota. This indicates that, since 1990, approximately 3 to 7 percent of those who gambled in the year before being surveyed reported Level 2 (problem) or Level 3 (pathological) gambling symptoms.

Looking only at pathological gamblers (Level 3) among those who reported having gambled in the year prior to being surveyed, the Mississippi estimate of 4.3 percent is again notably higher than in other states. Setting aside that value, the prevalence estimates in the other states surveyed ranged from 0.7 percent in California to 1.9 percent in Louisiana. Thus, approximately 1 to 2 percent of those who gambled in the year prior to being surveyed reported symptoms consistent with pathological gambling.

While this report was in its final stages, preliminary results were released from the national survey conducted by NORC for the National Gambling Impact Study Commission. As only the third national survey of gambling problems ever carried out, this is an important contribution to research on problem gambling. The NORC survey used a newly developed screening instrument, called "NORC DSM SCREEN for Gambling Problems" (NODS), for gambling problems based on DSM-IV criteria that has little direct overlap with the items in the SOGS, the instrument on which most of the prevalence research over the last decade has been based. This screen was not administered to all respondents, but rather only to those who acknowledged losing $100 or more in a single day or who have been $100 or more behind across an entire year of gambling. Based on this screen, the NORC results sorted some gamblers into a Type D, said to correspond to the Shaffer et al. (1997) category of problem gamblers, and a Type E, said to correspond to the Shaffer et al. category of probable pathological gamblers.

These differences in procedure, instrumentation, and categorization make comparison with the largely SOGS-based surveys in Table 3-3 questionable. Nor is the NODS or the procedures by which it was administered and scored sufficiently well validated to accept its estimates of the prevalence of pathological and problem gambling as definitive. Nonetheless, for the category of pathological gambling, the NORC estimates are similar to those reported here. NORC estimated the lifetime prevalence of pathological gamblers at 0.9 percent (compared with 1.5 percent estimated from the studies in Table 3-3) and the past-year prevalence at 0.6 percent (compared with 0.9 percent from Table 3-3). Since the NORC sample yielded only about 22 respondents classified as lifetime pathological gamblers and about 14 as past-year pathological gamblers, their estimates may not depart from those derived from Table 3-3 by more than would be expected from sampling error (no confidence intervals were reported in the NORC preliminary results).

In the category of problem gambling, however, the NORC estimates are much more discrepant from those derived from the surveys in Table 3-3. The NORC lifetime prevalence estimate is 1.2 percent (compared with 3.5 (median) percent calculated from Table 3-3) and their past-year estimate is 0.4 percent (compared with 2.2 (median) percent calculated from Table 3-3). Again, the numbers of respondents represented in the NORC figures are quite small, so these differing estimates may be within the range of sampling error. If not, however, then additional inquiry will be required to determine why these discrepancies are observed.

Primary Types of Gambling

Pathological and problem gambling may be associated with certain types of gambling more than others. If so, the proportion of respondents classified as pathological and problem gamblers who participate in some games should be higher than the comparable proportion of gamblers without problems participating in the same games. Eleven of the studies summarized in Table 3-3 reported the proportions of gamblers who had participated in various types of gambling activities at some time, usually during the past year or in their lifetime.[5] Table 3-4 reports the range and median of the differentials between the percentage of gamblers without problems (Level 1) and the percentage of problem and pathological gamblers (Levels 2 and 3 combined) who participated in each type of gambling across the 11 studies.

In general, the percentage of pathological and problem gamblers participating in each gambling activity was larger than the percentage of gamblers without problems for all forms of gambling. However, pathological and problem gamblers were most disproportionately active in bingo and charitable games, lotteries (both general and the instant variety), racetrack betting, sports betting, and casino games.

Gambling Expenditures

Eight of the studies listed in Table 3-3 reported the responses of gamblers to questions about their net monthly gambling expenditures. Although expense reporting has dubious accuracy, the data nonetheless provide some indication of the order of magnitude of the gambling expenditures of pathological and problem gamblers relative to other persons who gamble but are not classified as problem gamblers. For the gamblers without problems in these studies, the mean reported monthly expenditures ranged from $24 to $131 across the studies, with a median of $43. For the pathological and problem gamblers, the range across studies was from $121 to $660, with a median of $188. Thus, by self-report, pathological and problem gamblers spend approximately 4.5 times as much per month as gamblers without problems on their gambling activities.

Comparisons with Other Addictions Among Adults

To put the pathological and problem gambling prevalence rates in perspective, it is instructive to compare them with the rates for other addictive behaviors. The prevalence of alcohol dependence provides one relevant comparison. Like gambling, many people have access to alcohol and engage in drinking, but most of them do not abuse alcohol or become dependent. Drug dependence provides a different sort of comparison. Illicit drugs, being illegal, are not as widely available as alcohol and gambling, but many are highly addictive.

The National Comorbidity Survey (Kessler et al., 1994) provides data collected in 1990-1992 from a national probability sample of noninstitutionalized persons ages 15 to 54 for DSM-III-R psychiatric disorders. Table 3-5 shows the prevalence rates for alcohol and drug dependence compared with those for pathological gambling. In addition, the prevalence rates for alcohol dependence and abuse combined and for drug dependence and abuse combined are compared with the rates for pathological and problem gambling (Levels 2 and 3) combined. As Table 3-5 shows, the estimated prevalence rates for gambling problems are lower in all categories than those for alcohol and drug problems.

[5] Laundergran et al. (1990); Reilly and Guida (1990); Volberg (1992, 1993, 1995, 1995, 1996, 1997); Volberg and Boles (1995); Volberg and Silver (1993); Volberg and Stuefen (1994).

Increased Gambling Availability and Trends in Prevalence Rates

Over the past 20 years, there has been a steady expansion in the availability of legal gambling. Currently, legal forms of gambling are available in all the U.S. states except Hawaii, Tennessee, and Utah; 37 states have lotteries; the great majority permit gambling on charitable games, including bingo and pari-mutuel betting; and in 1998 casinos or casino-style gambling was permitted in 21 states (National Opinion Research Center, 1999). Such rapid expansion in the availability of gambling provides an opportunity to examine the extent to which increased availability is associated with increased prevalence rates for pathological and problem gambling. When comparing the 1975 survey lifetime prevalence estimate of 0.77 percent for probable compulsive gambling (Commission on the Review of the National Policy on Gambling, 1976) with the preliminary lifetime prevalence estimate of 0.9 percent for Type E pathological gamblers by the NORC survey (National Opinion Research Center, 1999), we see an increase of 0.13 percent. When the 1975 national estimate is compared with the committee's lifetime prevalence estimate of 1.5 percent we see an increase of .73 percent. However, each of these studies employed different operationalizations or measures of pathological gambling in their estimates. In addition, relatively few prevalence surveys have been conducted in the same state at two points in time so that trends during this period of expansion might be examined. Table 3-1 shows that the adult population in six states has been surveyed in different years using similar instruments (all SOGS variants): Connecticut (1991, 1996), Iowa (1988, 1995), Minnesota (1990, 1994), New York (1986, 1996), South Dakota (1991, 1993), and Texas (1992, 1995). Although the time periods represented and the changes in gambling opportunities in each of these states are different, this set of surveys nonetheless provides the best available evidence about trends in the prevalence of pathological gamblers over a period in which gambling opportunities were generally increasing. The prevalence rate estimates from these surveys are presented in Table 3-6.

Of these repeated surveys, the cases of Iowa, Minnesota, and Texas are especially interesting. In each of these states, the survey dates straddled the introduction of significant new legal gambling opportunities. In Iowa, riverboat casinos were opened and slot machines were permitted at the state's racetracks (Cox et al., 1997); in Minnesota, American Indian casino gambling was established (Emerson and Laundergan, 1996); and in Texas, a state lottery was instituted.

In all three of these states, the prevalence rates for pathological, problem, and pathological and problem gambling combined showed increases for past-year and/or lifetime gambling activities. All the increases were statistically significant in Iowa and Minnesota, but most of those in Texas fell short of significance.

In the remaining three cases of repeated surveys (Connecticut, New York, and South Dakota), no major new forms of gambling were introduced between surveys, but there was probably a general increase in the availability of legal gambling because of the national trends in this direction. In these states, the prevalence of pathological or problem gamblers showed statistically significant increases only in New York. The rates in Connecticut and South Dakota actually showed some decreases, although these were not statistically significant.

Because the differences in the prevalence rates found in surveys done at different times might be due to differences in response rates, sampling procedures, or a host of other such factors, these findings should not be overinterpreted. The nature of the changes observed,

however, was consistent with the view that increased opportunity to gamble results in more pathological and problem gambling.

In addition, the statistically significant findings in these studies were consistently in the direction of increases in pathological and problem gambling; none of the decreases was statistically significant. This pattern suggests that, during the recent decade, the prevalence of pathological and problem gambling has generally either stayed constant or increased. Further support comes from comparisons made by Volberg (1996) and in the Shaffer et al. (1997) meta-analysis. Both observed that the results of state-level prevalence studies conducted in more recent years have shown higher prevalence rates than those conducted in the 1980s.

VULNERABLE POPULATIONS

Several populations are of particular interest because of the possibility that they may be especially likely to develop gambling problems or, if such problems develop, because they may be especially vulnerable to their harmful effects. Other populations are of interest because the relative prevalence of pathological and problem gamblers among them may shed light on the risk factors and causes of pathological gambling. Among the populations of particular interest for one or the other of these reasons are adolescents, the elderly, men, minorities, and the poor. There are substantial numbers of studies of adolescence prevalence, but the research on other possible vulnerable populations is more limited. The discussion below first reviews the studies of adolescent problem gambling and then examines what little has been identified that bears on the other populations of interest.

Adolescents

Table 3-7 provides descriptive information on the studies compiled by Shaffer et al. (1997) that report on pathological or problem gambling among U.S. adolescents. Table 3-8 summarizes the available data on the percentage of gambling behavior among adolescents assessed over the full history of their experience (lifetime) and for the year prior to the survey (past year). The percentage of adolescents who report having ever gambled during their lifetimes ranges from 39 to 92 percent in those surveys, with the 39 percent value being an outlier (next highest is 62 percent). The median is 85, indicating that a high percentage of adolescents have gambled at some time in their lives. The curious fact that estimates in Table 3-8 for a few lifetime proportions and medians are more uniform across studies than those reported for past-year proportions stems from different subsets of studies and, in some cases, different instruments within studies.

Not all of the studies contributing to Table 3-8 reported the percentage of adolescents participating in specific types of gambling but, among those that did, card games, lotteries, and games of skill were the most common. Although less frequently collected and reported, data on gambling in the past year give a more meaningful estimate of the prevalence of active adolescent gamblers. As Table 3-8 shows, the estimates for any gambling during the past year ranged from 52 to 89 percent over the six studies providing this information. The median value of 73 percent suggests that most adolescents not only gamble, but also have gambled fairly recently. The estimates for specific types of gambling show that the most frequent activities are card games and sports betting. (Appendix C provides information by state on the minimum legal age required to place a bet.)

Pathological and Problem Gamblers

Table 3-9 summarizes the information about the percentage of pathological and problem gamblers among adolescents defined over their lifetimes and for the past year that is available from the studies identified in Table 3-7 (conducted between 1988 and 1997) and for which reported lifetime proportions (necessarily) exceed past-year proportions. The committee urges caution when considering these data, because they stem from different subsets of studies and, in some cases, different instruments within studies. Recognizing these difficulties, 9 of the studies conducted in the past 10 years estimated the prevalence of past-year adolescent pathological and problem gambling combined (Levels 2 and 3) and reported these as proportions of those sampled. As shown in column eight of Table 3-9, estimates ranged from 11.3 to 27.7 percent, with a median of 20 percent. For pathological gamblers only, these studies presented past-year estimates ranging from 0.3 to 9.5 percent, with a median of 6.1 percent. Sixteen studies provided estimates of the proportion of lifetime adolescent pathological and problem gamblers. The range of estimates across these studies was from 7.7 to 34.9 percent, with a median of 15.5 percent. For pathological gamblers only, the estimates ranged from 1.2 percent to 11.2 percent, with a median of 5.0 percent. Acknowledging again the difficulty in interpreting these data, we observe that, in comparison to the proportions of adult pathological and problem gamblers presented earlier, by the prevailing operationalizations, the proportion of pathological gamblers among adolescents in the United States could be more than three times that of adults (5.0 versus 1.5 percent).

It is important to emphasize, however, that the proportions reported in the adolescent studies and those found in the adult studies using the prevailing measures and criteria are not always directly comparable. In particular, many of the studies of adolescents use adaptations of the pathological and problem gambling instruments especially tailored for adolescents. Moreover, even the same survey items may have different meaning for adolescents, for example, regarding debt incurred. These circumstances introduce the possibility that adolescent and adult scales measure different underlying constructs. In addition, there may be different thresholds for youthful and adult gambling problems--the same gambling behavior that might not be problematic for an adult could be considered excessive for an adolescent. In many studies, therefore, the criteria for classifying adolescents as pathological or problem gamblers are not the same as those used for adult samples. Thus, although studies of adolescents provide credible indications that the proportion of pathological and problem gamblers is higher among adolescents than among adults, the matter of how much higher depends on the definitions and interpretations applied to the respective groups.[6]

Given these problems of comparison, the most direct indication that the prevalence rates among adolescents are indeed greater than those among adults comes from research in which the same instruments and criteria are used to assess adolescents and adults in the same survey. For instance, the lower age strata in the adult studies should resemble adolescent samples, even though they rarely include people younger than 18 years old. Pathological and problem gambling rates are not generally reported for distinct age groups. What is reported is the proportion of respondents in each age group among problem gamblers and, separately, among

[6] This problem of applying similar definitions to both adolescents and adults has been similarly raised in the substance abuse literature. For example, there are several lines of validity evidence for alcohol dependence criteria for adults, but the evidence is less defensible when applied to adolescent drinkers (Martin and Winters, in press).

gamblers without problems. These can be compared for a number of the studies listed in Table 3-1.

One study (Reilly and Guida, 1990) presented a comparison for the age group 15-18 that showed a disproportionate number of problem gamblers relative to older age groups. Three other studies (Volberg, 1996a, 1997; New Mexico Department of Health, 1996) broke out the 18-20 age group; in all cases, the proportions were higher for problem gamblers than for those without problems. Another group of studies reported comparisons for the age group 18-24 (Emerson and Laundergan, 1996; Kallick et al., 1979; Laundergran et al., 1990; Wallisch 1993, 1996), all but one of which showed an overrepresentation of younger persons among problem gamblers. These age breakouts from the adult studies therefore support the studies of adolescent populations in revealing more gambling problems among younger respondents.

As noted earlier, while this report was in its final stages, preliminary results were released from the national survey conducted by NORC for the National Gambling Impact Study Commission. One component of that study was a survey of 500 youths ages 16 and 17. Using the instrument and procedures developed for the study, NORC estimated the prevalence among youth of pathological and problem gamblers combined at 1.5 percent. However, this estimate was based on responses by youth who reported they had lost $100 or more in a single day or as a net yearly loss. When this financial limitation was removed, the percentage of pathological and problem gamblers under their categorization increased to about 3 percent. In both cases, these figures are quite discrepant from the estimates derived from the studies in Table 3-9, i.e., 6.1 percent for past-year pathological gambling among youth and 15.5 percent for lifetime pathological and problem gambling. As we have discussed, however, the great variation among studies in procedures, instrumentation, and definitions makes it quite difficult to either compare or integrate findings regarding the prevalence of problem gambling among adolescents. The NORC study adds further variation to this situation. There remains considerable question about how pathological and problem gambling should be defined and measured among youth, and no general consensus on these matters seems to be emerging in the research.

Comparisons with Drug and Alcohol Problems

Some perspective on the magnitude of the prevalence rates for pathological and problem gambling among adolescents is provided by comparing them with the rates for other problem behaviors in the same population. Six of the studies identified in Table 3-7 not only examined the prevalence of gambling problems but also asked respondents about other problem behaviors (Volberg, 1993, 1996, 1998a; Allen, 1995; Steinberg, 1997; Westphal et al., 1997). These studies provide especially comparable information on other problem behaviors because of the common samples, methods, instruments, and so forth used to collect the data on both issues.

Among these six studies, three reported the percentages of adolescents who said they had used marijuana in the past month (Volberg, 1993, 1996, 1998a). These values ranged from 3 to 9 percent. The percentages using other drugs in the past month ranged from 1 to 2.5 percent. By comparison, in those same studies the proportions found to have the most serious (Level 3) gambling problems in the past year ranged from 1 to 4 percent. Combined with those classified as at-risk or problem gamblers (Level 2), the totals ranged from 10 to 23 percent, although it is important to note that the time periods differ.

Five of these studies reported the percentages of their adolescent samples that used alcohol once a month or more or ever had an alcohol problem (Steinberg, 1997; Volberg, 1993,

1996, 1998; Westphal et al., 1997). These proportions ranged from 8 to 23 percent. In these same studies, the proportion of pathological gamblers ranged from 1 to 6 percent, and the proportion of problem and pathological gamblers combined ranged from 9 to 23 percent.

Although the number of studies on this issue is limited, it appears that the rates of past-year pathological and problem gambling combined among adolescents in the United States are comparable to the rates of monthly alcohol use among adolescents, and with rates of adolescents ever having had a problem with alcohol. In addition, the rates of past-year pathological gambling among adolescents are nearly comparable to past-month marijuana use, and they equal or exceed past-month use of other illicit drugs by that population. These results are summarized in Table 3-10.

The Elderly and Other Age Groups

Seventeen of the studies identified in Table 3-1 provided breakdowns for gamblers without problems and problem and pathological gamblers in a form that permitted comparison across age groups.[7] As discussed above, virtually all of those breakdowns showed that the younger cohorts were overrepresented among pathological and problem gamblers in comparison to their proportions among gamblers without problems. In only 3 of the 17 studies did any age group over age 30 appear in greater proportions among pathological and problem gamblers than among gamblers without problems (Kallick et al., 1979; Emerson et al., 1994; Reilly and Guida, 1990). These instances occur roughly in the 40-60 age group, not in the most elderly categories, and the differences are relatively modest. In the remaining 14 studies, all groups over age 30 are proportionately larger among the gamblers without problems than among the problem or pathological gamblers. This evidence does not indicate that either middle-aged or elderly age cohorts are generally especially susceptible to gambling problems. The age relations appear to be confined almost exclusively to younger age groups. For a discussion of age and cohort effects and the difficulty of disentangling these from genuine longitudinal effects during research on age-related trends in problem and pathological gambling, see Chapter 4.

Gender

Eighteen of the studies identified in Table 3-1 provided gender breakouts for gamblers without problems in comparison to pathological or problem gamblers.[8] In all but one (New Mexico Department of Health, 1996), the proportion of men was greater among pathological and problem gamblers than among gamblers without problems. Among the gamblers without problems, the percentages of men across the available studies ranged from 40 to 64 percent, with a median of 47 percent. Among the pathological and problem gamblers, the proportions ranged from 45 to 80 percent, with a median of 62 percent. Correspondingly, the proportions of women among the gamblers without problems ranged from 38 to 60 percent, with a median of 53 percent; among pathological and problem gamblers, the percentages ranged from 20 to 55

[7] Emerson et al. (1994); Kallick et al. (1979); Laundergan et al. (1990); Reilly and Guida (1990); Volberg (1992, 1993, 1995, 1996, 1997); Volberg and Boles (1995); Volberg and Silver (1993); Volberg and Stuefen (1994); Volberg et al. (1991); Wallisch (1993, 1996); New Mexico Department of Health (1996).

[8] Cunningham et al. (1996); Emerson et al. (1994); Kallick et al. (1979); Emerson et al. (1994); Reilly and Guida (1990); Volberg (1992, 1993, 1995, 1996, 1997); Volberg and Boles (1995); Volberg and Silver (1993); Volberg and Stuefen (1994); Volberg et al. (1991); Wallisch (1993, 1996); New Mexico Department of Health (1996).

percent, with a median of 38 percent. Overall, therefore, men are much more likely to be pathological or problem gamblers than are women. It may be, however, that within this overall trend there are some types of gambling for which women are more likely than men to show problems. Unfortunately, the available research provides too few breakouts of gender by type of gambling to examine this issue.

Minorities

Eighteen of the studies identified in Table 3-1 provided breakouts of the comparative proportions of at least one ethnic group for gamblers without problems and problem and pathological gamblers.[9] Of those, 17 studies included either white or nonwhite as one category. These studies suggest that, in general, minorities who gamble are at risk for developing gambling problems. In every case, the proportion of minorities among the pathological and problem gamblers was greater than the proportion among gamblers without problems. Those percentages ranged from 5 to 63 percent, with a median of 31 percent, of the pathological and problem gamblers being minorities. By comparison, among the gamblers without problems the proportion of minorities ranged from 2 to 36 percent, with a median of 15 percent. These studies clearly indicate that minority groups are overrepresented among pathological and problem gamblers and would appear therefore to be at higher risk. The reasons for this overrepresentation are unknown, because the studies did not generally provide the numbers of minority respondents who gambled so that the rates of pathological or problem gambling gamblers within or across groups could be calculated. Less information was available about specific minority groups. Eight studies broke out the proportion of African Americans in the nonproblem, problem, and pathological gambling groups. The median values were 18 percent among pathological and problem gamblers and 11 percent among gamblers without problems. The five studies that reported the proportions of Hispanics had a median of 28 percent among pathological and problem gamblers and 22 percent among gamblers without problems. Only three studies reported on the percentage of American Indians among the gambling groups. Across those studies, American Indians were represented among pathological and problem gamblers ranging from 3 to 7 percent, compared with only 1 to 4 percent of the gamblers without problems. These studies are too few in number to allow meaningful comparisons across groups.

Income, Employment, and Education

Seventeen of the studies in Table 3-1 provided income distributions with two or more brackets for gamblers without problems compared with pathological and problem gamblers.[10] The most common breakout was to distinguish household income above and below $25,000 per year. Dividing all the income categories reported by any of the studies into these two broad categories showed some tendency for lower-income persons to be overrepresented among pathological and problem gamblers. In particular, the median percentage of the pathological and problem gamblers with income under $25,000 per year was 33 percent compared with 27 percent

[9] Cunningham et al. (1996); Emerson et al. (1994); Kallick et al. (1979); Laundergran et al. (1990); Reilly and Guida (1990); Volberg (1992, 1993, 1995, 1996, 1997); Volberg and Boles (1995); Volberg and Silver (1993); Volberg and Stuefen (1994); Volberg et al. (1991); Wallisch (1993, 1996); New Mexico Department of Health (1996).

[10] Emerson et al. (1994); Laundergran et al. (1990); Reilly and Guida (1990); Volberg (1992, 1993, 1995, 1996, 1997); Volberg and Boles (1995); Volberg and Silver (1993); Volberg and Stuefen (1994); Volberg et al. (1991); Wallisch, (1993, 1996); New Mexico Department of Health (1996).

of the gamblers without problems.

Only seven of the studies in Table 3-1 compared problem and pathological gamblers and gamblers without problems with regard to employment status.[11] Employed persons were represented in about equal proportions among the pathological and problem gamblers (median = 64 percent) as among the gamblers without problems (median = 61 percent). By contrast, there were larger differentials for persons who were disabled (three studies: median = 6 versus 2 percent), those in school including college (four studies: median = 13 versus 5 percent), and those who were retired (four studies: median = 3 versus 11 percent). Thus disabled persons and those in school were overrepresented among pathological and problem gamblers and retired persons were underrepresented.

Eighteen studies provided breakouts of educational background for the groups of gamblers without problems and problem and pathological gamblers.[12] These data show that education has a moderately strong relationship to the risk for problem and pathological gambling. Persons who had completed only high school or less were overrepresented among pathological and problem gamblers in these studies. Across 22 comparisons, a median value of 23 percent of the pathological or problem gamblers had a high school education or less compared with a median of 13 percent among gamblers without problems.

CONCLUSIONS

Although a substantial majority of the U.S. population gambles, not everyone does, and of those who do, relatively few experience adverse effects sufficient to qualify them as problem gamblers; fewer still can be considered pathological gamblers. The best current estimates of pathological and problem gambling among the general adult U.S. population and selected subpopulations can be found in the studies included in the meta-analysis conducted by the research team at Harvard Medical School, Division on Addictions (Shaffer et al., 1997). Based on its analysis of the U.S. prevalence studies that had been conducted in the past 10 years, the committee estimates that approximately 0.9 percent of the adults in the United States meet the SOGS criteria as pathological gamblers on the basis of their gambling activities in the past year. For pathological and problem gambling combined, the committee estimates that the prevalence rate for past-year activity was approximately 2.9 percent.

Applying these rates to the U.S. census estimates of the number of residents age 18 or older in 1997 (196 million) indicates that currently about 1.8 million adults are pathological gamblers and 5.7 million are either pathological or problem gamblers. In relation to drug and alcohol dependence, the current prevalence of pathological gamblers is equivalent to about one-third the estimated rate of drug-dependent persons under DSM-III-R criteria and one-eighth the estimated rate of alcohol-dependent persons.

The few instances of repeated surveys in the same state show either significant increases in the prevalence of pathological and problem gamblers or no significant change, indicating that the national trend over the last decade may be upward. In addition, some of the greatest increases shown in these repeated surveys came over periods of expanded gambling opportunities in the states studied. Although sparse, such evidence is consistent with the view

[11] Emerson et al. (1994); Laundergran et al. (1990); Volberg (1997); Volberg and Boles (1995); Wallisch (1993, 1996); New Mexico Department of Health (1996).

[12] Cunningham et al. (1996); Emerson et al. (1994); Emerson et al. (1994); Laundergran et al. (1990); Reilly and Guida (1990); Volberg (1992, 1993, 1995, 1996, 1997); Volberg and Boles (1995); Volberg and Silver (1993); Volberg and Stuefen (1994); Volberg et al. (1991); Wallisch (1993, 1996); New Mexico Department of Health (1996).

that expansions in the availability of gambling have resulted in increased numbers of pathological and problem gamblers.

The most recent gambling surveys also show that the prevalence rates for pathological and problem gamblers vary substantially for different population subgroups in the states studied. The rates are higher for adolescents than for any of the older age groups and higher for men than for women. Prevalence rates were also higher for minorities than for whites and were somewhat higher for lower-income and less-educated people than for their higher-income and more-educated counterparts. Across subpopulations, therefore, we would expect the prevalence rates for pathological and problem gambling to be highest for minority men, especially adolescents, with relatively low levels of income and education.

The gambling behavior of adolescents has been more frequently studied than that of other vulnerable populations. On the basis of the available studies, the committee estimates that the current prevalence rate for pathological gambling among adolescents is approximately 6.1 percent and for pathological and problem gamblers combined, about 20 percent. Taken at face value, these figures indicate considerably higher levels of pathological and problem gambling among adolescents than adults. And although the evidence consistently shows higher rates among adolescents, it is difficult to determine how much higher those rates are. Differences between survey instruments, in criteria for classification as a pathological or problem gambler, and in the significance of certain symptoms (e.g., incurring debt) complicate any attempt to directly compare adolescent and adult prevalence rates.

Nonetheless, the best available evidence indicates that pathological and problem gambling among adolescents is a significant problem. The proportion of adolescents classified as pathological and problem gamblers in recent studies examining this issue are roughly comparable to the proportions who use alcohol once a month or more or who use illicit drugs.

Although we have characterized the findings of the research currently available, it is important to emphasize how inadequate that research base is for drawing confident conclusions about the prevalence of pathological and problem gambling in the U.S. population or in important subpopulations. Only three national prevalence surveys have been conducted since 1977, and each estimated in a way quite different from ways used to operationalize and measure the prevalence of pathological (and problem) gambling in the past 10 years. All consideration of more recent periods must therefore rely on a modest number of state-level surveys. Moreover, the states covered in those surveys do not constitute a representative sample of U.S. states or even a reasonable purposive sample. Further limitations apply to the assessment of trends in pathological and problem gambling during the recent decades of great expansion in the availability of legal gambling opportunities. Prevalence surveys have been conducted at more than one time in only a handful of states, and in some of those cases the same instrument and sampling procedures were not used on both occasions.

Further complications are associated with the relatively unstandardized constructs, operational definitions, screening instruments, and criteria that have been used in research on pathological and problem gambling. This variation makes most attempts to compare prevalence rates across states, regions, periods of time, and subpopulations problematic.

For purposes of constructing national prevalence estimates for pathological and problem gambling and breaking out important subpopulations, the existing research provides only limited and uncertain information. As a basis for informed policy discussion, therefore, the available prevalence data are incomplete. The findings presented in this chapter are best viewed as rough

estimates of the likely orders of magnitude for the prevalence of pathological and problem gamblers, not as definitive estimates.

Nevertheless, these finding indicate that pathological and problem gambling is an important enough social issue to warrant a sizeable investment in epidemiological and other studies. It would be useful to undertake a variety of studies that use a common set of instruments, definitions, and design criteria. Studies of high caliber would also distinguish between prevalence and incidence while accounting for conditional risk factors; they would also distinguish between the proportion of pathological and problem gamblers and rates of pathological and problem gambling in both general and subpopulations; and they would be consistent in their use of screening instruments validated for use in general populations to measure pathological and problem gambling longitudinally.

TABLE 3-1 General Adult Population Surveys of Gambling Conducted in the United States, 1975-1997

Year of Survey	*State*	*Type of Survey*	*Instrument*	*Sample Size*	*Author*	*Meta-Analysis Ref #*
1989	California	Telephone	SOGS	1,250	Volberg	94
1977	Connecticut	Face-to-face	3-item scale	568	Abrahamson	125
1986	Connecticut	Telephone	DIS	1,224	Laventhol	56
1991	Connecticut	Telephone	SOGS	1,000	Christiansen/Cummings	10
1996	Connecticut	Telephone	SOGS	992	WEFA Group	154
1994	Georgia	Telephone	SOGS	1,550	Volberg and Boles	99
1990	Indiana	Telephone	DSM-IV mod	1,015	Laventhal and Horwath	55
1988	Iowa	Telephone	SOGS	750	Volberg and Steadman b	94, 105
1995	Iowa	Telephone	SOGS-R	1,500	Volberg a	95
1995	Louisiana	Telephone	SOGS-R	1,818	Volberg b	96, 113
1988	Maryland	Telephone	SOGS	750	Volberg and Steadman a	94, 104
1989	Massachusetts	Telephone	SOGS	750	Volberg	94
1990	Minnesota	Telephone	SOGS-M	1,251	Laundergan et al.	54
1994	Minnesota	Telephone	SOGS-M	1,028	Emerson and Laundergan	23, 24
1996	Mississippi	Telephone	SOGS	1,014	Volberg b	98
1981	Missouri	Face-to-face	DIS	2,954	Cunningham et al.	16
1992	Montana	Telephone	SOGS-R	1,020	Volberg	89
1975	Nevada	Face-to-face	ISR	296	Kallick et al.	43
1988	New Jersey	Telephone	SOGS	1,000	Volberg and Steadman a	94, 104
1996	New Mexico	Telephone	DSM-IV mod	1,279	University of New Mexico	140
1986	New York	Telephone	SOGS	1,000	Volberg and Steadman	103
1996	New York	Telephone	SOGS/DSM-IV	1,829	Volberg a	97
1992	North Dakota	Telephone	SOGS-R	1,517	Volberg and Silver	102
1985	Ohio	Telephone	CC/CS	801	Culleton	86
1991	South Dakota	Telephone	SOGS mod	1,560	Volberg et al.	107
1993	South Dakota	Telephone	SOGS-R	1,767	Volberg and Stuefen	106
1992	Texas	Telephone	SOGS	6,308	Wallisch	109
1995	Texas	Telephone	SOGS	7,015	Wallisch	110
1992	Washington	Telephone	SOGS	1,502	Volberg	92
1995	Wisconsin	Telephone	DSM-IV mod	1,000	Thompson	85
1984	Mid-Atlantic	Telephone	ISR/IGB	534	Culleton	15, 78
1975	National	Face-to-face	ISR	1,736	Kallick et al.	43
1990	Not reported	Not reported	2-item scale	900	Ubell	148

SOGS:	South Oaks Gambling Screen	DIS:	Diagnostic Interview Schedule
SOGS-M:	SOGS multifactor method	ISR:	Institute of Survey Research "compulsive gambler" items
SOGS-R:	SOGS modified for adolescents	IGB:	Inventory of Gambling Behavior
DSM:	Diagnostic and Statistical Manual criteria	CC:	Custer criteria
DSM mod:	modified DSM criteria	CS:	Clinical signs

SOURCE: Shaffer et al. (1997) database.

TABLE 3-2 Percentage of the Adult Population Reporting Lifetime and Past-Year Gambling for Different Types of Gambling (Surveys Conducted 1988-1997)

	Lifetime			*Past Year*		
	No. of Studies	***% Range***	***Median %***	***No. of Studies***	***% Range***	***Median%***
Any gambling	17	64-96	87	11	49-88	72
Lottery	11	28-81	64	10	5–40	24
Video lottery terminal	9	09-54	26	6	6-44	26
Casino	8	19-66	36	7	6-44	27
Charitable	7	13-67	38	3	4-40	04
Pari-mutuel	11	15-37	30	9	4-12	08
Sports	11	20-45	29	9	9-26	17
Cards	9	20-49	26	5	10-20	18
Skill	6	13-25	18	2	11-11	11
Financial markets	9	07-20	12	5	5-7	5
Illicit	2	56-65	60	4	4-39	18

Source: Summarized from the studies identified in Table 3-1 that reported pertinent data and were conducted during the last 10 years (1988-1997).

Table 3-3 Percentage Classified as Pathological or Problem Gamblers in Adult Population Samples (Surveys Conducted 1988-1997)

			Lifetime (All Respondents)			*Past Year (All Respondents)*			*Past Year (Gamblers Only)*	
Ref #	***Year***	***State***	***Levels 2 & 3***	***Level 2***	***Level 3***	***Levels 2 & 3***	***Level 2***	***Level 3***	***Levels 2 & 3***	***Level 3***
94	1989	California			1.2					
154	1996	Connecticut	5.4	4.2	1.2	2.8	2.2	0.6	3.2	0.7
99	1994	Georgia	4.4	2.8	1.6	2.3	1.5	0.8	3.5	1.2
55	1990	Indiana	5.6	5.5	.1					
95	1995	Iowa	5.4	3.5	1.9	3.3	2.3	1.0	4.6	1.4
96	1995	Louisiana	7.0	4.5	2.5	4.8	3.4	1.4	6.6	1.9
104	1988	Maryland	3.9	2.4	1.5					
94	1989	Massachusetts			2.3					
24	1994	Minnesota				4.4	3.2	1.2	6.8	1.8
98	1996	Mississippi	6.8	3.7	3.1	4.9	2.8	2.1	10.0	4.3
89	1992	Montana	3.6	2.3	1.3	2.2	1.5	0.7		
104	1988	New Jersey	4.2	2.8	1.4					
140	1996	New Mexico				14.7	11.2	3.4		
97	1996	New York	7.3	4.7	2.6	3.6	2.2	1.4	4.5	1.8
102	1992	North Dakota	3.5	2.5	1.0	2.0	1.3	0.7	2.7	1.0
106	1993	South Dakota	2.3	1.4	0..9	1.2	0.7	0.5		
110	1995	Texas	5.4	3.6	1.8	3.0	2.2	0.8	4.4	1.2
92	1992	Washington	5.0	3.5	1.5	2.8	1.9	0.9	3.5	1.1
85	1995	Wisconsin	12.9	12.0	0.9					
148	1990	Not reported			2.0					

SOURCE: Shaffer et al. (1997) database.

TABLE 3-4 Participation Rates in Different Types of Gambling for Nonproblem and Problem and Pathological Gamblers Combined

Gambling Activity	*Number of Studies*	*Range of % Differences Between Level 1 and Level 2/3 Combined*	*Median % Difference Between Level 1 and Level 2/3 Combined*
Bingo, charitable games	3	12-24	21
Lottery, general	9	8-29	20
Instant/daily lottery, pulltabs	11	7-33	16
Racetrack, horse races	3	10-27	18
Sports betting	11	6-35	16
Casino, casino games	8	7-24	15
Card games	6	8-34	12
Games of skill	2	12-13	12
Video poker	2	7-18	12

Source: Summarized from the studies identified in Table 3-3 that reported pertinent data and were conducted during the last 10 years (1988-1997).

TABLE 3-5 Comparison of U.S Adult Pathological and Problem Gambling With Alcohol and Drug Dependence and Abuse

	Pathological Gambling	***Alcohol Dependence***	***Drug Dependence***	***Pathological And Problem Gambling***	***Alcohol Dependence And Abuse***	***Drug Dependence And Abuse***
12-Month	0.9%	7.2%	2.8%	2.9%	9.7%	3.6%
Lifetime	1.5%	14.1%	7.5%	5.4%	23.5%	11.9%
Source	Committee analysis of Shaffer et al. 1997 data	National Comorbidity Survey (NCS): Kessler et al., 1994	National Comorbidity Survey (NCS): Kessler et al., 1994	Committee analysis of Shaffer et al. 1997 data	National Comorbidity Survey (NCS): Kessler et al., 1994	National Comorbidity Survey (NCS): Kessler et al., 1994

TABLE 3-6 Percentage of (Level 3) Pathological and/or (Level 2) Problem Gamblers in Adult Population Samples in States with Repeated Surveys

			Lifetime (All Respondents)			*Past Year* [a] *(All Respondents)*			*Past Year (Gamblers Only)*	
Ref #	*Year*	*State*	*Levels 2 & 3*	*Level 2*	*Level 3*	*Levels 2 & 3*	*Level 2*	*Level 3*	*Levels 2 & 3*	*Level 3*
10	1991	Connecticut	6.3	3.6	2.7					
154	1996	Connecticut	5.4	4.2	1.2	2.8	2.2	0.6	3.2	0.7
105	1988	Iowa	1.7	1.6	0.1					
95	1995	Iowa	5.4	3.5	1.9	3.3	2.3	1.0	4.6	1.4
54	1990	Minnesota	2.5	1.6	0.9	4.0	1.4			
24	1994	Minnesota	4.4	3.2	1.2	6.8	1.8			
103	1986	New York	4.2	2.8	1.4					
97	1996	New York	7.3	4.7	2.6	3.6	2.2	1.4	4.5	1.8
107	1991	South Dakota	2.8	1.8	1.0	1.4	0.8	0.6		
106	1993	South Dakota	2.3	1.4	0.9	1.2	0.7	0.5		
109	1992	Texas	4.8	3.5	1.3	2.5	1.7	0.8	5.1	1.6
110	1995	Texas	5.4	3.6	1.8	3.0	2.2	0.8	4.4	1.2

[a] The South Dakota surveys asked about gambling problems within the past six months rather than past year.

SOURCE: Shaffer et al. (1997) database.

Table 3-7 Surveys of Adolescents and College Students Conducted in the United States, 1975-1998

Year of Survey	*State*	*Sample*	*Survey*	*Instrument*[a]	*Size*	*Study Author*	*Meta-Analysis Ref. #*
1989	Connecticut	High school	Not reported	DSM-III-R	1,592	Steinberg	149
1996	Connecticut	High school	Paper/pencil	SOGS-RAb/MAGS	3,886	Steinberg	149
1995	Connecticut	College	Paper /pencil	SOGS-P	238	Devlin and Peppard	19
1995	Florida	High school	Paper/pencil	SOGS-RA	1,882	Lieberman and Cuadrado	64
1996	Georgia	Adolescent	Telephone	SOGS/SOGS-M	1,007	Volberg b	151
1997	Louisiana	Middle/high	Paper/pencil	SOGS-RAn	12,066	Westphal et al.	157
1995	Massachusetts	Middle/high	Paper/pencil	DSM-IV/MAGS	466	Vagge	87
1993	Massachusetts	High school	Paper/pencil	DSM-IV/MAGS	856	Shaffer et al.	75
1994	Massachusetts	High school	Paper/pencil	DSM-IV/MAGS	854	Shaffer and Hall	74
1994	Massachusetts	High school	Paper/pencil	GAPS	1,500	Allen	126
1994	Michigan	College	Paper/pencil	SOGS	1,147	Lumley and Roby	138
1995	Minnesota	High school	Paper/pencil	SOGS mod	277	Zitzow	123
1990	Minnesota	High school	Telephone	SOGS-RAb,n	532	Winters et al.	117, 119
1992	Minnesota	High sch/coll	Telephone	SOGS-RAb,n	532	Winters et al.	117, 119
1995	Minnesota	College	Paper/pencil	SOGS	868	Winters et al.	114
1990	Minnesota	Adolescent	Combination	SOGS-RAb	1,094	Winters et al.	115, 116
1988	Nevada	College	Not reported	SOGS	219	Lesieur et al.	60
1992	Nevada	College	Not reported	SOGS/DSM-III-R,IV	544	Oster and Knapp	70
1994	Nevada	College	Not reported	SOGS/DSM-III-R	350	Oster and Knapp	70
1987	New Jersey	College	Paper/pencil	SOGS	636	Frank	28, 29
1988	New Jersey	College	Not reported	SOGS	227	Lesieur et al.	60
1986	New Jersey	Combination	Paper/pencil	DSM-III mod	892	Lesieur and Klein	62
1990	New Jersey	Adolescent	Telephone	DSM-IV	858	Reilly and Guida	71
1988	New York	College	Not reported	SOGS	446	Lesieur et al.	60
1997	New York	Adolescent	Telephone	SOGS-M/MAGS/DSM	1,103	Volberg	156
1988	Oklahoma	College	Not reported	SOGS	583	Lesieur et al.	60
1988	Texas	College	Not reported	SOGS	299	Lesieur et al.	60
1992	Texas	Adolescent	Telephone	SOGS-M/SOGS mod	924	Wallisch	108
1995	Texas	Adolescent	Telephone	SOGS-M	3,079	Wallisch	110
1993	Washington	Adolescent	Telephone	SOGS-M/SOGS-RAb	1,054	Volberg	88
1986	Wisconsin	College	Paper/pencil	Self assess	604	Cook	12
1988	Combination	College	Not reported	SOGS	1,771	Lesieur et al.	60
1985	Not reported	College	Other	SOGS/DSM-III-R	384	Lesieur and Blume	57, 58

[a] SOGS: South Oaks Gambling Screen; SOGS-P: SOGS Plus; SOGS-RA: SOGS modified for adolescents, n=narrow criteria, b=broad criteria; SOGS-M: SOGS multifactor method; MAGS: Massachusetts Gambling Screen; GAPS: Modified MAGS; DSM: Diagnostic and Statistical Manual criteria; DSM mod: modified DSM criteria.

SOURCE: Shaffer et al. (1997) database.

TABLE 3-8: Percentages of Adolescents Reporting That They Have Participated in Various Types of Gambling

	Lifetime			*Past Year*		
Form of Gambling	***Range***	***Median***	***Number of Studies***	***Range***	***Median***	***Number of Studies***
Any gambling	39-92	85	21	52-89	73	6
Cards	21-59	53	17	32-71	42	9
Casino	3-84	27	13	1-71	10	6
Financial markets	15-23	18	7	--------	---	---
Illicit	2-10	9	3	--------	---	---
Lottery	15-69	42	19	10-65	28	11
Pari-mutuel	7-41	20	15	4-29	09	8
Skill	12-51	41	17	22-60	31	10
Sports betting	11-49	31	17	16-53	40	10
Video lottery terminal	24-28	26	3	--------	---	---

SOURCE: Summarized from studies identified in Table 3-7 above that reported pertinent data.

Note: The estimates above are independent and not necessarily from the same studies (i.e., some studies reported only lifetime proportions, and some studies reported both lifetime and past-year proportions of various forms of gambling participation).

TABLE 3-9 Percentage Classified as Pathological and/or Problem Gamblers in Adolescent Samples (Surveys conducted 1988-1997)

				Lifetime			*Past Year*		
Ref #	*Year*	*State*	*Sample*	*Levels 2 & 3*	*Level 2*	*Level 3*	*Levels 2 & 3*	*Level 2*	*Level 3*
149	1989	Connecticut	High school	9.9	8.2	1.7	.	.	
149	1996	Connecticut	High school	.	.	.	18.1	9.4	8.7
19	1995	Connecticut	College	.	2.5	.	.	.	.
64	1995	Florida	High school	.	.	.	27.7	23.0	4.7
151	1996	Georgia	Adolescent	10.1	6.7	3.4	.	.	.
157	1997	Louisiana	Middle/high	.	.	.	16.0	10.0	6.0
87	1995	Massachusetts	Middle/high	.	.	.	19.1	14.8	4.3
75	1993	Massachusetts	High school	.	.	.	.	.	4.4
74	1994	Massachusetts	High school	.	.	.	20.0	13.0	7.0
126	1994	Massachusetts	High school	.	.	.	11.3	10.9	0.3
138	1994	Michigan	College	30.8	27.7	3.1	.	.	.
123	1995	Minnesota	High school	19.5	12.3	7.2	.	.	.
119	1990	Minnesota	High school	.	.	.	24.8	16.6	8.2
119	1992	Minnesota	High sch/coll	.	.	.	24.2	14.7	9.5
114	1995	Minnesota	College	7.7	4.8	2.9	.	.	.
115	1990	Minnesota	Adolescent	.	.	.	26.1	19.9	6.2
60	1988	Nevada	College	16.0	12.4	3.6	.	.	.
70	1992	Nevada	College	34.9	23.7	11.2	.	.	.
70	1994	Nevada	College	25.4	17.4	08.0	.	.	.
60	1988	New Jersey	College	16.0	10.0	6.0	.	.	.
71	1990	New Jersey	Adolescent	18.9	7.7	1.2	.	.	.
60	1988	New York	College	18.0	10.4	7.6	.	.	.
60	1988	Oklahoma	College	11.0	6.0	5.0	.	.	.
60	1988	Texas	College	12.0	7.0	5.0	.	.	.
108	1992	Texas	Adolescent	16.7	11.7	5.0	.	.	.
110	1995	Texas	Adolescent	12.2	9.9	2.3	.	.	.
60	1988	Combination	College	15.0	9.5	5.5	.	.	.

SOURCE: Shaffer et al. (1997) database.

TABLE 3-10 Comparison of U.S. Adolescent Pathological Gambling, Alcohol Use, and Drug Use Rates

Gambling	*Alcohol Use*	*Drug Use*
1 - 6% pathological gambling, past year 9 - 23% pathological or problem gambling, past year	8 -23% use alcohol once a month or more, or have ever had an alcohol problem	3-9% marijuana use, past month 1-2.5% use of other drugs, past month

REFERENCES

Allen, T.F.
1995 The incidence of adolescent gambling and drug involvement. Providence, RI: Rhode Island College School of Social Work.

Christiansen/Cummings Associates Inc.
1992 Legal gambling in Connecticut: Assessment of current status and options for the future(volume one) (Report to the State of Connecticut Division of Special Revenue). New York: Author.

Commission on the Review of National Policy Toward Gambling
1976 Gambling in America: Final report of the Commission on the Review of the National Policy Toward Gambling. Washington, D.C.: Author.

Cook, D.R.
1987 Self-identified addictions and emotional disturbances in a sample of college students. Psychology of Addictive Behaviors 1(1),:55-61.

Cox, S., H.R. Lesieur, R.J. Rosenthal, and 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(1): 22-41.

Culleton, R.P., and M.H. Lang
1985 The prevalence rate of pathological gambling in the Delaware Valley in 1984 (Report to People Acting To Help, Philadelphia PA). Camden, NJ: Forum for Policy Research and Public Service, Rutgers University.

Cunningham, R.M., L.B. Cottler, and W.M. Compton
1996 Taking chances: Problem gamblers and mental health disorders - results from the St. Louis epidemiologic catchment area (ECA) study. St. Louis, MO: Washington. University School of Medicine, Department of Psychiatry.

Cunningham-Williams, R.M., L.B. Cottler, W.M. Compton, and E.L. Spitznagel
1998 Taking chances: Problem gamblers and mental health disorders - results from the St. Louis Epidemiological Catchment Area (ECA) Study. American Journal of Public Health 88(7):1093-1096.

Devlin, A.S., and D.M. Peppard
1996 Casino use by college students. Psychological Reports, 78, 899-906.

Emerson, M.O., and J.C. Laundergan
1996 Gambling and problem gambling among adult Minnesotans: Changes 1990 to 1994. Journal of Gambling Studies 12(3):291-304.

Emerson, M.O., J.C. Laundergan, and J.M. Schaefer
1994 Adult survey of Minnesota problem gambling behavior; a needs assessment: Changes 1990 to 1994 (Report to the Minnesota Department of Human Services, Mental Health Division). Duluth: University of Minnesota Center for Addiction Studies.

Frank, M.L.
1993 Underage gambling in New Jersey. In Gambling behavior and problem gambling, W.R. Eadington & J.A. Cornelius, eds., (pp. 387-394). Reno, NV: Institute for the

Study of Gambling and Commercial Gaming.

Frank, M.L.
1990 Underage gambling in Atlantic City casinos. Psychological Reports 67:907-912.

Kallick, M., D. Suits, T. Dielman, and J. Hybels
1979 A survey of American gambling attitudes and behavior (Research report series, Survey Research Center, Institute for Social Research). Ann Arbor, MI: University of Michigan Press.

Kessler, R.C., K.A. McGonagle, S. Zhao, C.B. Nelson, M. Hughes, S. Eshleman, H-U. Wittchen, and K.S. Kendler
1994 Lifetime and 12-Month Prevalence of DSM-III-R Psychiatric Disorders in the United States. Archives of General Psychiatry 51(1):8-19.

Laundergan, J.C., J.M. Schaefer, K.F. Eckhoff, and P.L. Pirie
1990 Adult survey of Minnesota gambling behavior: A benchmark, 1990 . St. Paul, MN: State of Minnesota Department of Human Services, Mental Health Division.

Laventhal and Horwath.
1990 A study of pathological and problem gambling among citizens of Indiana associated with participation in the Indiana state lottery. Indianapolis: Author.

Laventhol and Horwath, and David Cwi and Associates
1986 The effects of legalized gambling on the citizens of the state of Connecticut. Newington: State of Connecticut Division of Special Revenue.

Lesieur, H.R.
1988 Altering the DSM-III criteria for pathological gambling. Journal of Gambling Behavior 4(1):38-47.

Lesieur, H.R., and S.B. Blume
1987 The South Oaks gambling screen (SOGS): A new instrument for the identification of pathological gamblers. American Journal of Psychiatry 144(9):1184-1188.

Lesieur, H.R., J. Cross, M. Frank, M. Welch, C.M. White, G. Rubenstein, K. Mosely, and M. Mark
1991 Gambling and pathological gambling among university students. Addictive Behaviors 16:517-527.

Lesieur, H.R., and R. Klein
1987 Pathological gambling among high school students. Addictive Behaviors 12:129-135.

Lieberman, L., and M. Cuadrado,
1996 Summary data on Florida high school student gambling in five counties. Altamonte Springs, FL: Florida Council on Compulsive Gambling, Inc.

Martin, C., and K.C. Winters
Press Diagnosis and assessment of alcohol use disorders among adolescents. Alcohol Health and Research World.

National Opinion Research Center
1999 Overview of the National Survey and Community Database Research on Gambling Behavior: Report to the National Gambling Impact Study Commission. Chicago, IL: Author.

New Mexico Department of Health, & University of New Mexico Center on Alcoholism Substance Abuse and Addictions. (1996). New Mexico survey of gambling

behavior. Santa Fe, New Mexico: Author.

Oster, S., and T.J. Knapp

1994 Casino gambling by underage patrons: Two studies of a university student population. Paper presented at the Ninth International Conference on Gambling and Risk-Taking, Las Vegas, NV. June 2.

Reilly, P., and F. Guida

1990 Pathological gambling prevalence in New Jersey 1990 final report (Report to the New Jersey Department of Higher Education). Piscataway, NJ: University of Medicine and Dentistry.

Shaffer, H.J., M.N. Hall and J.V. Bilt

1997 Estimating the Prevalence of Disordered Gambling Behavior in the United States and Canada: A meta-analysis. 12/15/97. Boston, MA: Harvard Medical School Division of Addictions.

Shaffer, H.J., and M.N. Hall

1994 The emergence of youthful addiction: The prevalence of pathological gambling among adolescents at Agawan high school (Massachusetts Council on Compulsive Gambling: Technical Report Serier 031594-HS100). Boston: Massachusetts Council on Compulsive Gambling.

Shaffer, H.J., R. LaBrie, K.M. Scanlan, and T.N. Cummings

1994 Pathological gambling among adolescents: Massachusetts gambling screen MAGS). Journal of Gambling Studies 10(4):339-362.

Sommers, I.

1988 Pathological gambling: Estimating prevalence and group characteristics. International Journal of the Addictions 23(5):477-490.

Steinberg, M.A.

1997 Connecticut high school problem gambling surveys 1989 & 1996. Guilford, CT: Connecticut Council on Problem Gambling.

Thompson, W.N., R. Gazel, and D. Rickman

1996 The social costs of gambling in Wisconsin. Wisconsin Policy Research Institute Report 9(6):1-44.

Transition Planning Associates

1985 A survey of pathological gamblers in the state of Ohio. Philadelphia: Author.

Vagge, L.M.

1996 The development of youth gambling. Unpublished Honors Thesis, Harvard-Radcliffe Colleges, Cambridge, MA.

Volberg, R.A.

1998a Gambling and problem gambling among adolescents in New York. Albany, NY: New York Council on Problem Gambling, Inc

Volberg, R.A.

1998b Methodological Issues in Research on Problem Gambling. Paper Commissioned by National Research Council, Committee on the Social and Economic Impact of Pathological Gambling, Washington, D.C.

Volberg, R.A.

1997 Gambling and problem gambling in Mississippi: A report to the Mississippi Council on Compulsive Gambling. Mississippi: Social Science Research Center,

Mississippi State University.

Volberg, R.A.
1996a Gambling and problem gambling in New York: A 10-year replication survey, 1986 to 1996 (Report to the New York Council on Problem Gambling). Roaring Spring, PA: Gemini Research.

Volberg, R.A.
1996b Prevalence studies of problem gambling in the United States. Journal of Gambling Studies 12(2):111-128.

Volberg, R.A.
1995a Gambling and problem gambling in Iowa: A replication study (Report to the Iowa Department of Human Services). Roaring Spring, PA: Gemini Research.

Volberg, R.A.
1995b Wagering and problem wagering in Louisiana (Report to the Louisiana Economic Development & Gaming Corporation). Roaring Spring, PA: Gemini Research.

Volberg, R.A.
1994 The prevalence and demographics of pathological gamblers: Implications for public health. American Journal of Public Health 84:237-241.

Volberg, R.
1993 Gambling and problem gambling among adolescents in Washington state. Albany, NY: Gemini Research.

Volberg, R.A.
1992 Gambling involvement and problem gambling in Montana. Albany, NY: Gemini Research.

Volberg, R.A., and J. Boles
1995 Gambling and problem gambling in Georgia (Report to the Georgia Department of Human Resources). Roaring Spring, PA: Gemini Research.

Volberg, R.A., and E. Silver
1993 Gambling and problem gambling in North Dakota (Report to the North Dakota Department of Human Services, Division of Mental Health). Albany, NY: Gemini Research.

Volberg, R.A., and H.J. Steadman
1989 Delmar, NY: Policy Research Associates, Inc.

Volberg, R.A., and H.J. Steadman
1988a Prevalence estimates of pathological gambling in New Jersey and Maryland. American Journal of Psychiatry 146(12):1618-1619.

Volberg, R.A., and H.J. Steadman
1988b Refining prevalence estimates of pathological gambling. American Journal of Psychiatry 145(4):502-505.

Volberg, R.A., and R.M. Stuefen
1994 Gambling and problem gambling in South Dakota: A follow-up survey . Vermillion: Business Research Bureau, University of South Dakota.

Volberg, R.A., R.M. Stuefen, and M.K. Madden
1991 Gaming in South Dakota: A study of gambling participation and problem gambling and a statistical description and analysis of its socioeconomic impacts. Vermillion: Business Research Bureau, University of South Dakota.

Walker, M.B., and M.G. Dickerson

1996 The prevalence of problem and pathological gambling: A critical analysis. Journal of Gambling Studies 12(2):233-249.

Wallisch, L.S.

1996 Gambling in Texas: 1995 surveys of adult and adolescent gambling behavior. Austin, TX: Texas Commission on Alcohol and Drug Abuse.

Wallisch, L.S.

1993 Gambling in Texas: 1992 Texas survey of adult gambling behavior. Austin, TX: Texas Commission on Alcohol and Drug Abuse.

Westphal, J.R. and J. Rush

1996 Pathological gambling in Louisiana: An epidemiological perspective. Journal of the Louisiana State Medical Society, 148:353-358.

Westphal, J.R., J.A. Rush, and L. Stevens

1997 Statewide baseline survey for pathological gambling and substance abuse Louisiana adolescents. Baton Rouge, LA: Louisiana Department of Health and Hospitals, Office of Alcohol and Drug Abuse.

Winters, K.C., P.L. Bengtson, D. Dorr, And R.D. Stinchfield

1998 Prevalence and risk factors of problem gambling among college students. Psychology of Addictive Behaviors 12 (2):127-135.

Winters, K.C., R. Stinchfield, and J. Fulkerson

1990 Adolescent survey of gambling behavior in Minnesota: A benchmark . Minneapolis: Center for Adolescent Substance Abuse, University of Minnesota.

Winters, K.C., and R.D. Stinchfield

1993 Gambling behavior among Minnesota youth: Monitoring change from 1990 to 1991/1992. Minneapolis: Center for Adolescent Substance Abuse, University of Minnesota.

SET A/B IN TEXT

Winters, K.C., R. Stinchfield, and J. Fulkerson

1993 Patterns and characteristics of adolescent gambling. Journal of Gambling Studies, *9*(4):371-386.

Winters, K.C., R.D. Stinchfield, and J. Fulkerson

1993 Toward the development of an adolescent gambling severity scale. Journal of Gambling Studies 9(1):63-84.

Winters, K.C., R.D. Stinchfield, and L.G. Kim

1995 Monitoring adolescent gambling in Minnesota. Journal of Gambling Studies 11(2):165-183.

Zitzow, D.

1996 Comparative study of problematic gambling behaviors between American Indian and non-Indian adolescents within and near a northern plains reservation. American Indian and Alaskan Native Mental Health Research 7(2):14-26.