

### **CHAPTER 3. ECONOMIC ANALYSIS OF THE CONSEQUENCES OF GAMBLING PROBLEMS AMONG ADULTS**

Problem and pathological gamblers, as defined in previous sections of this report, experience excessive rates of adverse consequences that have tangible economic costs. Further consequences experienced by these gamblers that are quite real (e.g., broken relationships and families), although not readily amenable to having price tags attached, are often termed “intangible” costs. Another dimension of gambling consequences is that their impact is usually spread across an entire community. While costs begin with the gambler, they spill over to the household, other family members, friends, employers, creditors, and the community as a whole.

The focus of this analysis is on the tangible economic value of gamblers’ problems or consequences that have been identified and analyzed in the literature on problem and pathological gambling (see, e.g., Lesieur 1998; Volberg et al. 1998). The earliest studies examined these phenomena through indepth interviews and surveys of persons who sought help to control their gambling. This approach has been effective in identifying the breadth and types of consequences that pathological gamblers experience and in exploring alternative ways that economic values can be attached to some of these problems. The analysis in this study in large measure builds upon the prior studies, but refines the earlier methods in order to generate estimates of the impacts of problem gambling among problem and pathological gamblers who can be identified from surveys of the general population.

The estimates in this study diverge from reported impacts and costs among the very small proportion of problem and pathological gamblers who have sought help (believed to be only about 3 percent; Volberg 1998). Since it is often the severity and accumulation of problems well beyond the threshold of clinical concern that may drive gamblers to seek treatment (Lesieur 1998), we expect that the average costs and impacts from the general population will be significantly lower than the estimates from treatment populations.

A challenge is posed for this study based on the fact that “denial” is considered a clinical characteristic of addictive disorders, including gambling. This has led to some concern among researchers (see, e.g., Chapter 6, by W. Thompson. in WEFA Group 1998) that surveys of the general population will not elicit acknowledgement or valid responses from pathological and problem gamblers that are selected into the samples. While this study has asked for specific attribution of adverse consequences/outcomes by respondents to gambling problems, the primary emphasis has been upon consequences that are experienced by the entire population, which are also susceptible to being affected by gambling problems. It is believed that asking about general problems without requiring adverse outcomes to be attributed to gambling (although allowing it) should elicit plausible responses. While validation surveys would be useful in the future, the findings in the rest of this section demonstrate that pathological and problem gamblers are indeed willing to acknowledge adverse outcomes, and at rates in excess of low-risk gamblers and nongamblers; indeed, our study found that the very low proportions that experience adverse consequences tend to attribute them to problem and pathological gambling. Examples of such consequences include job and financial problems, divorce, poor health, and criminal justice involvement.

In this analysis, our basic strategy is to compare rates (and costs) of specific adverse consequences associated with problem and pathological gambling for each of our designated gambling types. For example, problem and pathological gamblers (and perhaps those considered at risk as well) are believed to experience higher rates of personal bankruptcy (primarily attributed to their problems with gambling) than persons who are otherwise similar but do not gamble or at lower risk gamblers. Obviously, there are reasons unrelated to gambling for individuals to experience bankruptcy.

The analysis thus attempts to ascertain whether the bankruptcy rates (and other negative consequences) of problem and pathological gamblers are greater than bankruptcy rates of other gambling types who are otherwise similar, and to determine whether the difference is larger than might be expected due to chance. The bankruptcy cost attributed to problem and pathological gambling adjusts for “expected” rates of bankruptcy. Thus, the estimates are of “excessive” costs (be it for bankruptcy, job loss, health problems, etc.) experienced by problem and pathological gamblers.

In attempting to assess the postulated impacts, the survey incorporated questions that explicitly examined behaviors and problems that prior research on problem and pathological gambling has suggested are disproportionately experienced by this population. A large number of questions ask whether respondents attributed specific aspects of such problems directly to gambling.

Costs that could be measured on an annualized, present-value basis (poor physical and mental health, job losses/unemployment) sum to about \$1,200 and \$700 for each pathological and problem gambler, respectively. Other costs are infrequent (e.g., divorce, bankruptcy, arrest, incarceration), and in the absence of a very large study sample, they are more readily observed and measured on a lifetime basis (e.g., “Have you ever been divorced?” vs. “Have you gotten divorced in the past year?”). We estimate these “lifetime” costs (which are additive with the “annual” costs when the latter have been translated to a lifetime basis) at about \$10,500 and \$5,100 per pathological and problem gambler, respectively. About 25 percent of these estimates are costs generally termed “transfers.” Under standard economic theory, transfers are not treated as costs because they represent a *loss* to the “donors” (generally taxpayers) and a *gain* to the recipients (in this case, problem and pathological gamblers). Thus, the total cost (including transfers) might be thought of as the cost to those who are not problem or pathological gamblers.

In this analysis we estimate costs per person by gambler type, with a particular focus on problem and pathological. We combined the cases from the supplemental survey of patrons with cases from the adult telephone survey. As explained in Chapter 2, we re-weighted these groups in order to make the weighted samples generally equivalent to the age and gender distribution of the general population of 197 million adults age 18 and older in 1998. This strategy is designed to maximize information about the problem and pathological gamblers who were relatively rare in the telephone survey and much more numerous in the patron survey. It is possible to convert these to aggregate or total national costs—that is, to sum our economic quantities to represent the entire population by combining the estimates of the number of problem and pathological gamblers with our estimates of the costs per problem and pathological gambler (per year and across lifetime).

Other dimensions of the analysis concern the time period over which gamblers have experienced symptoms of pathological and problem gambling and the component of the data from which estimates have been derived. This concerns whether the individual is classified as a pathological or problem gambler for the past year (number of problems reported in the past 12 months), or on a lifetime basis. The second issue concerns estimates for the random digit dial (RDD), patron survey, or combined data set.

We believe that the best estimates for the purpose of understanding the economic impacts of pathological and problem gambling come from use of the combined survey and lifetime measures. The estimates in this section of the report are based largely on these calculations. However, we have also examined the potential impact of using the different survey components and the past year versus lifetime in a series of tabulations that appear in the appendices.

When the data are reassessed by the noncombined survey components and the past-year classification, the general patterns reported in this chapter are supported. However, relatively few observations are available for many of the values calculated, and small numbers generate unstable estimates. For example, the impact of past year pathological gambling sometimes is and sometimes is not estimated to be greater than the impact of lifetime-but-not-past-year gambling. We observe this for problem gambling as well. These instabilities do not invalidate the estimates but simply reflect random variation around the main effect in relatively small samples. Furthermore, the study has not attempted to identify when patterns of problems were initiated or stopped, or their duration. Pathological and problem gambling are often long-term, with the adverse impact(s) building up over time. The adverse consequences may take some time to abate, and may never completely do so. A person with a problematic work history (or criminal justice record) carries such a record forward the rest of their life.

Tabulations appearing in the appendix also compare the rates from the RDD and patron survey. The patron survey has a higher concentration of pathological and problem gamblers (as a share of all persons interviewed); this is the principal reason this supplemental survey was undertaken. In both components of the survey we find that pathological gamblers generally have comparable, if not higher or more severe problems than problem gamblers. These two groups certainly have more severe impacts than other types of gamblers (and non-gamblers). Pathological gamblers in the two respective components of the study (RDD and patron) are generally more like each other in terms of problems and impacts than they are like “problem,” “at-risk” or “no problem” gamblers. The same statement is true for the “problem” gamblers in each study component—they are generally more like each other than like other types of gamblers.

We believe that the combined sample provides the best technical results for the purpose of the analyses done in this chapter, and we have used them for the main analysis and for the preparatory analyses with a few exceptions. In compressing the length of the RDD interview so as to better suit the patron-intercept mode of data collection, some questions in the RDD survey pertinent to the analysis in this chapter were omitted from the patron questionnaire. In these instances we have used the RDD instead of the combined data in order to develop estimates of problem prevalence from which costs were calculated. All such instances are identified in the applicable table. Appendix C includes disaggregated estimates of all of the fundamental descriptive values used in developing the cost estimates.

## **Prior Studies on the Costs of Gambling**

There have been several prior efforts at describing the economic impacts of problem and pathological gambling (e.g., Lesieur and Anderson 1995, Thompson, Gazel, and Rickman 1996; WEFA Group 1997; Westphal, Rush, and Stevens 1998; also see reviews by Lesieur 1998; Volberg et al. 1998). The critical contribution of these studies has been the identification of consequences and impacts of problem and pathological gambling that have economic implications, and the efforts made to develop estimates of these costs. Among the obvious financial consequences these studies have examined are gambling-attributed bankruptcy, dissipation of assets, debt, and theft. Other impacts studied are missed work or lateness to work, lost employment, stress and impaired physical and mental health, suicidal ideation, and alcohol- and drug-related disorders. Families and personal relationships usually are adversely affected, with associated conflict and strife, with divorce frequently the result.

For the most part, the existing body of research examines persons in treatment for a gambling disorder. This approach has had obvious advantages in developing and understanding the phenomenon. Persons in treatment have generally initiated treatment because they experienced severe consequences from their gambling. Patients enrolled in treatment based on the self-help tradition are generally encouraged to be forthright about the problems they have caused or encountered related to their disorder, whether it is for gambling, alcohol, drugs, or some other problem. It is possible to compile a picture of the problems of pathological gamblers that go for treatment by reviewing these studies.

Still, the objective of this study is to attempt to portray the consequences and economic costs of typical or average problem and pathological gamblers. Data on gamblers in treatment probably describe the most severely impacted individuals—the tail of the distribution in terms of severity and number of impacts. We expect that the general population survey will identify individuals who have not reached this extreme level of severity.

Our survey instrument asked about most of the impacts that the existing literature indicates are likely to be experienced (or imposed) by problem and pathological gamblers. The following sections will attempt to give some indication as to how comparable the measured impacts are to prior estimates derived from individuals in treatment or Gamblers Anonymous (GA).

## **Costly Consequences of Gambling**

The NODS survey undertook to examine a number of different types of impacts of problem and pathological gambling. These included family impacts, job impacts, financial problems, and criminal/legal problems. While there are many facets and dimensions to such problems, there are certain issues that are more conducive to both measurement and valuation. Therefore, this analysis focuses on a small number of tangible consequences. The consequences of concern were selected both because a body of literature already exists that strongly suggests that problem and pathological gambling may cause such outcomes (e.g., Lesieur and Anderson 1995, Thompson, Gazel and Rickman 1996, Volberg 1998), and because it is possible to measure certain economic values that are associated with them. Such consequences include the following:

- Divorce;
- Poor health and mental health problems;
- Job loss and lost wages from unemployment;
- Bankruptcy; and
- Arrest and incarceration.

Based on the existing research literature, it is expected that gamblers with higher counts of gambling symptoms will have higher rates of problems. Since the problems often attributed to problem and pathological gambling are also experienced by many people whether or not they gamble, we adjust for whether a problem or pathological gambler has other characteristics or behaviors that might contribute to the consequence in question. For example, if those who gamble also have alcohol and drug problems, ignoring these other problems might result in attributing an inaccurately high consequence rate to problem and pathological gambling.

Our analysis used logistical regression to control for the following sociodemographic factors: age, gender, ethnicity, educational attainment, residence with one's children, and use/abuse of alcohol and illicit drugs. In general, these factors were generally strongly predictive of whether individuals had experienced the costly consequences identified above. Ignoring these control factors would result in attributing a larger proportion of the consequences to gambling than if the controls were applied. The specifications of the variables used and the primary results are presented in the annexes to this chapter.

As we state above, it is important to note that many of the costs often associated with problem and pathological gambling are not unique to persons who gamble or who might need help for gambling problems. Thus, our analysis examines the following questions:

- To what extent did the problem and pathological gamblers surveyed experience a certain consequence?
- To what extent did they attribute the consequence to their gambling?
- What plausible economic costs can be associated with higher than expected rates of this consequence?

Based on these questions, we concluded that the major findings are as follows:

- Problem and pathological gamblers have significantly higher rates of costly consequences than otherwise similar persons do.
- Problem and pathological gamblers experience or impose thousands of dollars of economic costs per year on society.
- Problem and pathological gamblers rarely directly attributed these costly problems to their gambling behaviors or difficulties.

The next section presents our findings about the extent to which consequences with tangible economic costs are associated with different types of gamblers. These patterns are analyzed in order to determine whether problem and pathological gamblers have other

characteristics or behaviors that may be the cause of their higher rates of consequences, such as gender or age. The section thereafter presents our findings on selected economic impacts experienced or imposed by problem and pathological gamblers, adjusting for the effects of other factors.

### **Employment-related impacts**

Adverse financial consequences are the crux of the issue for problem and pathological gambling. While there are obviously other manifestations and consequences that can and often do arise, the financial problems are generally thought to underlie these in some way. One potential mechanism through which gambling might bring adverse consequences is for the gambler to lose too much money relative to her or his earning capacity and/or wealth. Problem and pathological gamblers in this study display a pattern of higher rates of certain types of financial problems relative to other gamblers (with no or few problems) and to nongamblers. While this finding is almost tautological (attributing financial problems to gambling contributes to a determination of gambling type), this is exactly the pattern of problems that contributes to other sorts of consequences (e.g., family, legal, and health problems).

Another mechanism for adverse consequences is for one to engage in gambling at times and places that are inappropriate given one's responsibilities; adverse outcomes could include a decline in job performance and additional costs to employers, job loss, lost wages, and reliance on Unemployment Insurance and/or other social welfare programs.

Studies of pathological gamblers in treatment have looked at a variety of the potential impacts on the workplace, but they have been limited by not having comparison populations. Such studies have examined narrow aspects such as lateness or missing work in order to gamble as well as gambling while on the job, while broader impacts have included job loss and unemployment. While it is possible to develop cost estimates from such data, they may present an inaccurate picture, since workers in general are sometimes late and miss work, or use work time for personal purposes.

Lesieur (1998) found in his review of the cost literature that between 69 and 76 percent of pathological gamblers have missed work at some point in order to gamble. Various studies in his review found that from 21 to 36 percent of gamblers in treatment have attributed a lost job to their gambling problems. A survey in Wisconsin of 98 GA respondents found that 66 percent had missed work due to gambling, and 21 percent had lost or quit their jobs due to gambling (Thompson et al. 1996). A general population telephone survey found that problem gamblers miss slightly more work (2.7 days and 1.7 days for "level 2 and 3" gamblers, respectively) than low-risk and nongamblers (0.9 days) (Westphal et al. 1998).

Our model attempts to reflect these issues by building on the standard model of labor markets. This model decomposes the employment experience into labor market participation/employment, amount of employment, and wage rate. In the standard model of the labor market, the wage rate represents the perceived/actual value of the employees' productivity to their employers. Divergence of an employee's perceived/actual productivity from their expected rate will result in an increase or decrease in their wage or salary and/or termination (in the case of under-performance). In an economic model of the labor market, we hypothesize that to the extent problem and pathological gamblers' behaviors in the workplace impact their overall or average performance, employers will

generally recognize and reward the worker with continued employment and increased wages, or penalize the worker with lower wages and/or termination of employment.

The data reveal somewhat complex patterns regarding employment. For example, pathological gamblers had relatively high employment (76.3 percent) at the time of the survey. However, among those that had worked in the past year, we found a slightly higher (but not statistically significant) rate of working less than a full year (about 26.6 percent, versus 18.6 percent for low-risk gamblers). Still, pathological gamblers who had worked in the prior 12 months were significantly more likely to have lost/been fired from a job (13.8 percent versus 4 percent for low-risk gamblers). However, they were not significantly more likely to have been earning a wage below \$10 per hour than others. The mean household income for pathological gamblers was about 15 percent lower than for low-risk gamblers, but this difference was not statistically significant.

**Table 11. Employment Experiences, by Type of Gambler (Lifetime Only)**

Type of Characteristic	Gambling Type				
	Non-gambler	Low Risk	At Risk	Problem Gambler	Path. Gambler
Employed currently	55.3***	73.3	71.5	58.9***	76.3
Any employment past year	64.4	78.8	80.3	77.2	82.3
<i>Among Those Working Past Year...</i>					
Any unemployment	21.5	12.7	17.7	23.8	15.9
Months unemployed	1.6	0.9	1.3	1.8	1.3
Lost a job/fired past year	2.6	4.0	5.6	10.8 $\phi$	13.8*
Hourly wage (RDD only)	\$14.60	\$18.20	\$18.10	\$18.00	\$17.90

Statistical significance of differences between groups tested using multivariate logistical regression, with control variables for age, gender, ethnicity, education, child in household, and alcohol and drug use/abuse. Gamblers with no problems were used as the base group.

Significance tests: Problem and pathological types tested *separately*; statistically significant at the: \*\*\* = 0.01 level; \*\* = 0.05 level. \* = 0.10 level. Problem and pathological types were *combined* for significance testing; statistically significant at the:  $\phi\phi\phi$  = 0.01 level;  $\phi\phi$  = 0.05 level.  $\phi$  = 0.10 level.

Problem gamblers, in contrast, were significantly more likely to have been unemployed or at least not working at the time of their interview (58.9 percent, versus 73.3 percent for low-risk gamblers). However, those who did work were employed for as much of the year as low-risk gamblers. Their rate of having lost or been fired from a job was also higher (10.8 percent compared to 2.6 percent for nongamblers). Wage rates did not appear to be impaired in this group.

### *Employers' losses*

The most unambiguous measure of employer dissatisfaction with employee performance (productivity) is to fire an employee. As noted above, both problem and pathological gamblers have higher rates of job loss than low-risk or nongamblers—10.8 and 13.8 percent, respectively (compared to the expected rates of 5.8 and 5.5 percent). Employers incur search and training costs assumed equal to 10 percent of the annual salary for each employee replaced. Frazis et al. (1998) estimated that 4 percent of an employee's hours go into training; we are assuming employer costs equivalent to an additional 6 percent of an employee's time is invested in recruiting and initially training a replacement hire.

Since pathological gamblers in our sample earned about \$18 per hour, or \$40,000 per year, firing an employee costs an employer an average of \$4,000. Since pathological gamblers had a job loss rate of 13.8 percent, versus the expected rate of 5.8 percent, their “excess” rate of job loss was 8 percent. Therefore, the average pathological gambler cost his or her employer 8 percent of \$4,000, or about \$320. The cost of excess job loss for each problem gambler was \$200.

**Table 12. Annual Financial and Job Losses by Problem and Pathological Gamblers**

	<b>Who Pays the Cost</b>	<b>Problem Gamblers</b>	<b>Path. Gamblers</b>
Job loss	Employer	\$200	\$320
Unemployment/wage	Gambler	n.s.	n.s.
Lower wage/salary	Gambler	n.s.	n.s.

***Employees’ loss of earnings***

Even though problem and pathological gamblers have elevated rates of job loss, there is no systematic indication that they earned less than otherwise similar individuals due to either excess unemployment or lower wages. While problem gamblers had a lower employment rate than expected at the time of the interview, we elected not to incorporate this in our cost estimates, because the estimate does not appear to be supported by other related measures. For example, problem gamblers were virtually identical to low-risk and nongamblers in the proportion that had less than a full year of employment. Also, their average hourly wage rate was virtually the same. This is not necessarily inconsistent with an elevated rate of job loss. If problem and pathological gamblers are less likely to voluntarily quit or leave jobs, their aggregate rate of unemployment could be the same even though they are more likely to be fired or laid off.

***Bankruptcy, debt, unemployment insurance and welfare***

Previous studies of GA and treatment populations have given a good deal of attention to other financial impacts. Such studies have found, for example, that pathological gamblers have high levels of debt and declare bankruptcy at higher rates than other types of gamblers (and nongamblers). Research on gambling treatment populations found that gambling-attributed current debt (as opposed to lifetime borrowing) was \$39,000 in Wisconsin and \$114,000 in Illinois (Thompson, Gazel and Rickman 1996; Lesieur and Anderson 1995). These studies found that in the GA/treatment populations, between 18 and 28 percent of males and 8 percent of females had declared bankruptcy.

However, debt per se is not unexpected or an indication of unusual problems, as many individuals buy residences, automobiles, and other large purchases on credit. What is unusual is when an individual declares bankruptcy, based on an inability to repay debt when compared to the income of the individual or the household. When bankruptcy occurs, some fraction of the debt may be never repaid, and it is this fraction of debt and borrowing that constitutes a loss to creditors (rather than the magnitude of borrowing or indebtedness). However, this loss is theoretically considered a transfer, and generally is not be included in “cost” estimates.

Pathological gamblers have clearly elevated rates of indebtedness, both in an absolute sense and relative to their income. Indebtedness per person is 25-percent greater than

that of low-risk gamblers and about 120-percent greater than that of nongamblers. However, the disparity is even greater when debt is compared to income: pathological gamblers owe \$1.20 for every dollar of annual income, while low-risk and nongamblers only owe \$0.80 and \$0.60, respectively. In accord with their higher debt, pathological gamblers have significantly elevated rates of having ever declared bankruptcy: 19.2 percent, versus 5.5 percent and 4.2 percent for low-risk and nongamblers.

Again, for problem gamblers the story is not as clear. Their average level of indebtedness is actually the lowest of any type of gambler; however, they still have an elevated rate of bankruptcy (10.3 percent), but this is only marginally statistically significant when compared to the rate among nongamblers.

**Table 13. Financial Characteristics and Impacts, by Type of Gambler**

Characteristic	Lifetime Gambling Behavior				
	Non-gambler	Low-Risk	At-Risk	Problem Gambler	Path. Gambler
Any unemployment benefits, 12 mos.	4.6	4.0	10.9	10.9*	15.0**
Received welfare benefits, 12 mos.	1.9	1.3	2.7	7.3*	4.6
Household income, 12 mos. (RDD)	\$36,000	\$47,000	\$48,000	\$45,000	\$40,000
Household debt, current (RDD)	\$22,000	\$38,000	\$37,000	\$14,000	\$48,000
Filed bankruptcy, ever	4.2	5.5	4.7	10.3 $\phi$	19.2*

Statistical significance of differences between groups tested using multivariate logistical regression, with control variables for age, gender, ethnicity, education, child in household, and alcohol and drug use/abuse. Gamblers with no problems were used as the base group.

Significance tests: pathological and problem types tested *separately*; statistically significant at the: \*\*\* = 0.01 level; \*\* = 0.05 level. \* = 0.10 level. Pathological and problem types *combined* for significance testing; statistically significant at the:  $\phi\phi\phi$  = 0.01 level;  $\phi\phi$  = 0.05 level.  $\phi$  = 0.10 level.

On average, excess lifetime losses involved with bankruptcy are about \$3,300 for pathological gamblers and \$1,600 for problem gamblers. Almost 19 percent of pathological gamblers have ever declared bankruptcy, versus an expected 10.8 percent, given their personal characteristics. For problem gamblers, their 10-percent rate compares to an expected rate of 6.3 percent. Personal bankruptcies result in an average of \$39,000 in losses to creditors (WEFA Group, 1998; Gropp et al., 1997), although one should keep in mind that there are major differences between Chapter 7 and 13 filings.

**Table 14. Financial Losses, by Type of Gambler**

Type of Cost	Who Pays Cost	Time Period of Estimate	Problem Gambler	Path. Gambler
Unemployment benefits	Government	Past Year	\$65	\$85
Welfare benefits	Government	Past Year	\$90	\$60
Filed bankruptcy	Creditors	Lifetime	\$1,600	\$3,300

### ***Criminal justice costs***

Pathological and problem gamblers in treatment populations often reveal that they have stolen money or other valuables in order to gamble or pay for gambling debts (Lesieur 1998). Nearly half (46 percent) of GA participants in Wisconsin reported they had ever stolen something to gamble, and 39 percent had been arrested (Thompson et al. 1996). The GA survey in Illinois found that 56 percent had stolen to gamble (Lesieur and Anderson 1995).

Although we asked study participants if they had ever stolen money in order to gamble or pay a gambling debt, the reported frequency was too low to measure, or at least report in this study. However, it was possible to obtain information about the frequency with which respondents reported ever being arrested and/or serving time in jail or prison (unfortunately, past-year rates were too low for analysis). However, these are only indirect measures of the underlying issue that we would like to measure. Still, to the extent that problem and pathological gamblers have rates of arrest and imprisonment that are greater than low-risk gamblers and nongamblers, it is possible to infer that the difference may be related to gambling behaviors and problems (although the direction of causality may be open to debate).

Table 15 below shows that those with more gambling symptoms have much higher rates of lifetime arrests and imprisonment. About one-third of problem and pathological gamblers reported having been arrested, compared to 10 percent of low-risk gamblers and only 4 percent of nongamblers. About 23 percent of pathological gamblers and 13 percent of problem gamblers have ever been imprisoned. Again, these rates are much higher than rates for low-risk gamblers and nongamblers (4 and 0.3 percent, respectively).

For this analysis, we performed tests to establish the probability that these differences were not primarily associated with other characteristics of the respective gambler types (e.g., age, gender, alcohol and drug problems) and were not observed due to chance. The arrest and imprisonment rates of problem and pathological gamblers were highly significant.

### ***Arrests***

Pathological and problem gamblers account for about \$1,000 each (\$1,250 and \$960, respectively) in excess lifetime police costs. Almost one-third of each group has been arrested or detained by the police at some time in their life (their expected rates are about 19 and 15 percent, respectively). Based on the survey, pathological and problem gamblers had been arrested about 3.3 and 1.6 times, if they had ever been arrested. In 1992 (the most recent national data available), police spent \$41.3 billion to make 14 million arrests (about \$2,900 per arrest; U.S. Dept. of Commerce 1998). Thus, the 32 percent of pathological gamblers with arrest histories had about \$10,000 in lifetime arrest costs. However, the \$10,000 must be prorated across all pathological gamblers, and further adjusted for the 19-percent expected rate of arrest in this population. Thus, the average cost per pathological gambler is  $\$10,000 \times (32\% - 19\%)$ , which equals \$1,250.

**Table 15. Weighted Occurrence of Criminal Justice Consequences, by Type of Gambler**

Type of Consequence	Lifetime Gambling Behavior				
	Non-gambler	Low Risk	At Risk	Problem Gambler	Path. Gambler
Arrested	4.5	11.1	20.7	36.3***	32.3*
Times arrested	1.7	2.1	2.9	1.6	3.3
Incarcerated (RDD only)	0.4	3.7	7.8	10.4	21.4

Statistical significance of differences between groups tested using multivariate logistical regression, with control variables for age, gender, ethnicity, education, child in household, and alcohol and drug use/abuse. Gamblers with no problems were used as the base group.

Significance tests: problem and pathological tested against low-risk gamblers; statistically significant at the: \*\*\* =0.01 level; \*\* = 0.05 level. \* = 0.10 level. Pathological and problem gamblers tested against nongamblers for significance test; statistically significant at the:  $\phi\phi\phi$  = 0.01 level;  $\phi\phi$  = 0.05 level.  $\phi$  = 0.10 level.

### ***Incarceration***

More than one-fifth of pathological gamblers have ever been incarcerated in a prison or jail in their lifetimes (the survey did not ask about number of incarcerations). The simulation indicates an expected rate of about 6 percent. The cost of incarcerations has been estimated based on the ratio of national police and corrections spending. The most recent survey of criminal justice spending found that total corrections costs were about one-quarter smaller than total police spending (USDOJ 1996). This ratio has been applied to estimate the lifetime incarceration costs for problem and pathological gamblers. However, a further adjustment has been made to account for the fact that pathological gamblers are much more likely to have been incarcerated, if ever arrested (this is consistent with the findings that pathological gamblers have 3.3 arrests, if ever arrested, compared to 2.1 for low-risk gamblers). Thus, pathological gamblers are estimated to have \$1,700 in lifetime corrections costs, with problem gamblers having \$670 in costs (see Table 16).

**Table 16. Criminal Justice Losses , by Type of Gambler**

Type of Cost	Who Pays Cost	Time Period of Estimate	Problem Gambler	Pathological Gambler
Arrests	Government	Lifetime	\$960	\$1,250
Corrections	Government	Lifetime	\$670	\$1,700

### ***Divorce***

Family problems are one of the primary concerns associated with problem and pathological gambling. Lesieur (1998) reports that between 26 and 30 percent of GA members attribute divorces or separations to their gambling difficulties. While this type of consequence is difficult to measure and to assign value to, the number of resulting divorces can be measured, and legal fees can be estimated. One measure of gambling as a factor in divorce is that respondents representing about 400,000 adults pointed to their own gambling as a cause or factor in a past divorce, and respondents representing 2 million adults identified a spouse’s gambling as a significant factor in a prior divorce.

The analysis estimates that the average pathological gambler has accumulated \$4,300 more than expected for legal fees involved with excess divorces (measured rate of 53.5

percent, versus an expected rate of 33.4 percent). Low-risk gamblers and nongamblers have lifetime divorce rates of 30 and 18 percent, respectively. Problem gamblers have losses of \$1,950 in lifetime excess divorce legal fees. Their reported divorce rate was 39.5 percent, compared to a rate of 31 percent expected for persons otherwise similar without gambling problems. Legal fees per divorce average \$20,000 (Wilson). The costs per problem and pathological gambler were developed by multiplying the average number of divorces per gambler times \$20,000 to get legal costs per gambler ever divorced. This total was averaged over all pathological gamblers and adjusted down to account for the difference between reported and predicted divorce rates.

**Table 17. Marital and Health Status, by Type of Gambler**

Status	Lifetime Gambling Behavior				
	Non-gambler	Low Risk	At- Risk	Problem Gambler	Path. Gambler
Divorced	18.2	29.8	36.3	39.5 $\phi\phi$	53.5**
Poor/ fair health	21.8	13.9	16.0	16.4	31.1**
Mental health tx.	6.9	6.5	5.8	12.8**	13.3**

Statistical significance of differences between groups tested using multivariate logistical regression, with control variables for age, gender, ethnicity, education, child in household, and alcohol and drug use/abuse. Gamblers with no problems were used as the base group.

Significance tests: Problem gamblers against pathological; statistically significant at the: \*\*\* = 0.01 level; \*\* = 0.05 level. \* = 0.10 level. Problem and pathological tested against nongamblers A for significance test; statistically significant at the:  $\phi\phi\phi$  = 0.01 level;  $\phi\phi$  = 0.05 level.  $\phi$  = 0.10 level.

The economic consequences of divorce are actually much greater than the direct value of the associated legal costs. The major economic conclusion from the divorce literature (Everett 1991) is that the economic well-being of children and the mother usually significantly falls, while that of males increases materially. Thus, there is a tragic winner–loser scenario, where the values are somewhat offsetting.

These costs are clearly to be differentiated from the emotional cost that is borne by all of those involved. The ability to calculate these economic costs in the present study is limited, however, because the costs are quite complicated. They involve interpersonal losses and gains by the adults and the children involved, and entail detailed information about the timing and duration of marriage, divorce, and any remarriage. The current study was not designed to perform such analyses, as it would be necessary to collect equivalent and extensive data for the two parties to the divorce. However, it is possible to describe the kinds and relative magnitudes of the economic impacts that prior research on divorce has identified.

One study estimated that women with minor children suffered a 73-percent reduction in their standard of living in the first year after divorce (Weitzman 1985). National statistics show that married couples had a median household income of \$47,000 in 1995, compared to \$21,000 for a female-headed household with absent husband (U.S. Department of Commerce 1998). This results from a combination of factors, such as the infrequency of awards of alimony (less than 20 percent of divorced women) and a scarce majority of women receiving child support (U.S. Department of Commerce 1986). This factor is further exacerbated by the fact that a significant fraction of child support and alimony payments are never made, and when women make recourse to courts, the legal costs can easily consume a significant share of the payments in arrears.

Another prominent aspect of the economic impact is that many mothers with small children do not work or work only part time. Leaving the workforce (generally because marriage makes this economically feasible), whether entirely or partially, impairs future earning ability through a loss of valuable work experience (Mincer and Polachek 1978). Also, part-time jobs generally entail lower skilled occupations with limited opportunities for career and earnings growth.

Paradoxically, when a previously unemployed mother returns to the workplace due to economic hardship associated with divorce, she experienced an increase in earnings; this increase is considered to offset the loss in income contributed by the absent spouse. However, this movement of a mother into the workplace in order to earn more constitutes a net loss (in an economic sense) of her contribution to the household, since she can spend less time engaged in child care and other household activities. One study estimated the difference in the value of these services at about \$12,000 per year (adjusted for inflation; Paringer and Berk 1977). This is the value of services the mother can no longer contribute to the operation of the household, because time is spent outside of the home engaged in paid employment.

Probably the longest term and potentially the greatest economic cost is associated with impacts on children. Several studies have found that children from divorced households have lower academic and/or occupational achievement (Krein 1986; Cassetty and Douthitt 1985). These costs would last for most of the lifetimes of the affected children, and when discounted to their present value, could be in the tens of thousands of dollars per child. Again, the economic costs of divorce are quite substantial, however they are measured. This study has only represented a small—although very tangible—component of such costs, because the study was not designed to undertake the level of sophisticated analysis needed to make such estimates.

### **Health care**

Several studies have suggested that pathological and problem gambling is correlated with a decline in health and elevated rates of illness—either physical or mental (Lesieur 1998). We did not identify research that examined personal health care utilization and expenditures, or health status (generally the strongest predictor of health expenditures within age and gender groups). It is unclear how gambling problems would cause adverse impacts on health, although such impacts are believed to be a function of stress and strain. In our survey, 33.8 percent of pathological gamblers reported that they were in poor or only fair health, while only about 14 percent of low-risk gamblers reported poor or fair health. We estimated that annual health care expenditures were elevated by about \$750 for pathological gamblers, with an estimated annual expenditure of about \$3,800 per capita. Based on their other characteristics, absent the effect of gambling, we expected significantly fewer pathological gamblers to be in poor or fair health—about 17 percent, with personal health expenditures of about \$3,000 per capita.<sup>6</sup>

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<sup>6</sup> This calculation used analyses from the National Medical Expenditure Survey and The Lewin Group's Health Benefits Simulation Model to produce estimates of expected annual expenditures for population groups defined on self-reported health status, gender and age (all available from NODS).

**Table 18. Divorce and Health Costs, by Type of Gambler**

Type of Cost	Who Pays Cost	Time Period of Estimate	Problem Gambler	Path. Gambler
Divorce	Gambler/spouse	Lifetime	\$1,950	\$4,300
Health	Insurance	Past year	n.s.	\$700
Mental Health	Insurance	Past year	\$360	\$330

**Mental health care**

Pathological and problem gamblers had annual mental health expenditures about \$330 and \$360 greater than expected, respectively. About 13 percent of these two groups reported past-year use of mental health services, while our analyses projected use by only about 6 percent. Utilization of mental health services was just under 7 percent for low-risk and nongamblers. In 1996, about \$50 billion was spent on mental health care (excluding psychiatric hospitals and residential treatment centers for children) to treat about 10 million adults (about \$5,000 per person receiving care; Mark et al. 1998). Therefore, an excess of 7 percent of problem and pathological gamblers had mental health problems, at an average cost of \$5,000 per year, which yields the estimated cost per problem and pathological gambler of about \$350 per year.

**Treatment for pathological gambling**

There have been no national studies on the issue of pathological gambling treatment. Volberg (1998) estimates that only about 3 percent of current pathological gamblers obtain professional treatment in a given year (not including participation in self-help groups like GA). This rate of treatment access is much lower than rates for persons with current drug addiction (about one-third), alcoholism (about 15 to 20 percent), and other mental disorders (ranging from about 40 to 80 percent). In Oregon, Volberg found that public clinics had about 600 documented patients and/or affected family members per year, compared to a current estimated prevalence of about 20,000 pathological gamblers.

Similarly, no substantial data exist regarding costs for treating pathological gambling. Inpatient treatment facilities generally keep patients for several weeks, at a cost of up to \$10,000; outpatient providers treat patients for several months or more, often taking on patients after they leave 24-hour care. Volberg (1998) reports that in Oregon, patients generally receive care for up to 6 months in outpatient addiction treatment centers (similar to the course of treatment for alcohol and drug addiction), although due to client dropout, the average duration of treatment per patient is about 3 months. Costs in these centers runs about \$70 per week (Mark et al. 1998), suggesting average costs per patient of between \$900 and \$1000.

In sum, about 3 percent of pathological gamblers seek care in a given year, with an average cost per person of \$1,000. If one uses these data to estimate the cost of treatment in a year, then the annual treatment cost per pathological gambler is about \$30. It is assumed that most problem gamblers do not seek treatment unless or until they advance to pathological. While in a given year a pathological gambler may have a 3 percent probability of entering treatment, over a period of pathological gambling there may be a greater probability that they will seek care.

### Total costs of pathological gambling

The total costs estimated above are summarized in Table 19. Costs are shown for both past year and lifetime, since certain costs could only be calculated in these respective units. Annual costs of lifetime pathological gamblers are estimated at \$1,195, compared to \$715 for lifetime problem gamblers. However, substantial additional costs are present that can only be estimated on a lifetime basis, as they did not occur frequently enough in the past year to be estimated with the current sample size. Lifetime impacts were \$10,550 and \$5,130 for pathological and problem gamblers.

**Table 19. Selected Economic Costs of Pathological and Problem Gambling: Costs per Pathological and Problem Gambler**

Type of Cost	Who Pays (Primary)	Problem Gambler Costs		Pathological Gambler Costs	
		Lifetime	Past Year	Lifetime	Past Year
Job loss	Employer	n.e.	\$200	n.e.	\$320
Unemployment benefits	Government	n.e.	\$65	n.e.	\$85
Welfare benefits	Government	n.e.	\$90	n.e.	\$60
Filed bankruptcy	Creditors	\$1,550	n.e.	\$3,300	n.e.
Arrests	Government	\$960	n.e.	\$1,250	n.e.
Corrections	Government	\$670	n.e.	\$1,700	n.e.
Divorce	Gambler/spouse	\$1,950	n.e.	\$4,300	n.e.
Poor health	Health insurance	n.e.	\$0	n.e.	\$700
Poor mental health	Health insurance	n.e.	\$360 <sup>@</sup>	n.e.	(\$330 <sup>@@</sup> )
Gamb. treatment	Government	0	0	n.e.	\$30
Total costs/impacts		\$5,130	\$715	\$10,550	\$1,195
Costs minus transfers		\$3,580	\$560	\$7,250	\$1,050
Transfers to gamblers		\$1,550	\$155	\$3,300	\$145

<sup>@</sup> This is a net increase in cost. <sup>@@</sup>This is a part of total health. n.e.: not able to be estimated in this survey.

We believe that the annual costs should be increased to incorporate some contribution from the lifetime costs. However, the basis for making such an allocation is weak at the present time. This study has found that past-year prevalence rates are about one-half of that for lifetime prevalence, indicating that pathological and problem gambling is a chronic problem for many, with the disorder going into remission and later recurring. Future studies should consider collecting data about the course of gambling problems, including the age of onset and the ebb and flow of gambling problems, in order to ascertain the period of time over which costs are incurred.

The sums indicated in the table include several types of costs that are termed “transfers” in the formal economic sense; they should be treated differently depending on the calculation one is making. Transfers are those costs that mainly represent a shifting of resources from one individual to another, with one person gaining what the other loses. The transfers of concern in this model are the costs of bankruptcy and the value of unemployment insurance and welfare benefits. These amounts accrue to the benefit of the problem and pathological gamblers and to the detriment of either their creditors or the government.

The costs of problem and pathological gambling minus transfers are \$1,050 and \$560 per year, and \$10,550 and \$5,130 per lifetime, respectively. When these sums are multiplied by the estimated prevalence of pathological and problem gamblers from the combined RDD+patron data file (which was used for the cost calculations), they translate into annual costs of about \$4 billion per year, and \$28 billion on a lifetime basis. If transfers to the gambler from creditors and other taxpayers are included, the costs rise to about \$5 billion per year and \$40 billion per lifetime.

Annualizing the lifetime estimates is difficult without a firm estimate of the average duration of problem and pathological gambling in the general population, which would provide a denominator for the lifetime costs. If the average age of onset were in adolescence or young adulthood and gambling persisted continuously or sporadically throughout the adult life, the average duration could be as long as 50 years. In this case, the lifetime costs would annualize to a present value in the neighborhood of \$1 billion. A lower estimate of the lifetime duration would increase the annual estimate.

### Summary

This section demonstrates that problem and pathological gamblers experience a variety of tangible consequences at rates that are significantly higher than would otherwise be expected based upon their sociodemographic (and substance abuse) characteristics. Such consequences include burdens to personal health, family, workplace, and the criminal justice system. In other words, such gamblers impose costs on themselves, their families, and on those around them, including employers, creditors, and taxpayers. It is possible to estimate economic impacts experienced by, or at the level of, the individual problem or pathological gambler. These estimates use standard and commonsense methods to attach valuations on the consequences that could be measured. Average annual costs per pathological gambler are about \$1,200 per year, and \$715 per year per problem gambler. “Lifetime” costs are estimated at \$10,550 and \$5,130. (Annual and lifetime costs should not be added together, since they are measured over different time periods.)

It is instructive to compare economic cost estimates from this study with measurable costs of other sources of morbidity, mortality, and productivity loss (see Table 20). The annual cost estimate for pathological and problem gambling in 1998 of \$5 billion (somewhat more if we annualize the lifetime costs) compares with 1995 estimates for drug abuse of \$110 billion and alcohol abuse of \$166.5 billion (Harwood et al. 1998). Motor vehicle crashes in 1992 cost \$71 billion (Blincoe and Faigin 1992). The most recent estimates for other major health problems such as diabetes, stroke, and heart disease have been compiled and compared by the National Institutes of Health (1997). The current economic impact of problem and pathological gambling, in terms of population or cost per prevalent case, appears smaller than the impacts of such lethal competitors as alcohol abuse and heart disease. However, the costs measurable by health-based estimation methods do not capture all of the consequences important to the person, family, or society. The burden of family breakdown, for example, is outside of these measures. And the value of further attention at the policy level may depend more on the quality of efforts to respond as on the extent of costs we can presently measure.

**Table 20. Economic Impacts of Major Health Problems**

Type of Problem	Annual Cost (billions)	Prevalence (millions)	Annual Cost per Prevalent Case
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			<b>(\$ per person)</b>
Path./prob. gambling	\$5	5.4	\$900
Drug abuse	\$110	6.7	\$10,000
Alcohol abuse	\$166	13.8	\$7,000
Mental illness	\$105	44	\$2,300
Stroke	\$30	3	\$10,000
Heart disease	\$125	21	\$6,000
Diabetes	\$92	15.5	\$5,800
Motor vehicle crashes	\$71	19	\$3,600
Smoking	\$72	46	\$1,500

A major component of cost for most of these problems is the cost of treatment, which is much more universally available, and administered much more often, to sufferers of trauma, organic illnesses, and other mental and behavioral disorders than to pathological or problem gamblers. Health care accounts for about one-half of the economic impact of mental illness, stroke, heart disease, and diabetes. The measured economic impacts therefore include the cost of society’s determination to respond directly to such problems.

The findings of this part of the report directly raise the question of the extent to which problem gambling behavior is the cause of the higher rates of consequences. This analysis cannot rule out the possibility that the gambling problems are actually reflective of certain underlying inclinations or values of these persons, such as a reduced willingness to abide by social norms or an inclination to take extra risks (not simply in gambling). To the extent that this is true, the gambling problems are as much symptomatic of the other characteristics or issues as causes of difficulties in the life of gamblers and their families. This is not to say that the gambling behavior is not in itself damaging as documented in this study, but that the additional issues will probably need to be addressed in order to ameliorate the tangible negative consequences of problem and pathological gambling.

While the conclusions of this analysis are relatively robust, they must be tempered by several factors. The small sample size was a limiting factor in the analysis. There were too few problem and pathological gamblers in the survey, even after the random digit dial and the patron surveys were combined and weighted to generate cost estimates for consequences that were directly attributed by interviewees to “gambling problems.” All of the costs that have been estimated are associated with excess rates of consequences that can be caused by factors in addition to problem and pathological gambling. Analyses have been done to adjust for selected other factors such as alcohol and drug use, age and educational attainment. Adjustment for these factors does result in smaller estimates of costs than would otherwise result simply by comparing problem and pathological gamblers to nongamblers and those with no problems.

Finally, the costs that we measured are tangible and relatively amenable to economic analysis. However, many of the human burdens of pathological and problem gambling are not so readily quantifiable into dollars, for conceptual and practical reasons. For example, we calculated the cost of divorce in terms of the legal fees generated to complete divorce actions through the court system. The cost in legal fees hardly begins to capture all of the social and psychological meaning of divorce for the partners and families directly involved, and for society as a whole. The economic costs that we calculated are a lower bound. Without a substantially greater research base on the

characteristics and consequences of pathological and problem gambling, it is impossible to say with precision where the upper bound or midpoint of economic impact would lie.

### **Annex 1: Description of Outcome Variables**

The economic and econometric analysis of the consequences of gambling problems examined the following respondent-specific outcome variables:

- *Not working*, dummy variable set equal to one if the respondent is unemployed or not in the labor force;
- *Employed less than 12 months in past year*, dummy variable set equal to one if the respondent, if employed at all, was employed for less than 12 months in the past year;
- *Lost job in past year*, dummy variable set equal to one if the respondent lost or was fired from his or her job in the past year;
- *Employed in low-wage job*, dummy variable set equal to one if the respondent's hourly wage is \$10 per hour or less;
- *Received unemployment insurance in past year*, dummy variable equal to one if the respondent reported having received unemployment insurance/disability benefits in the past year and reported being in fair, good, or excellent health;
- *Received welfare benefits in past year*, dummy variable equal to one if the respondent reported having received any welfare benefits, including AFDC/TANF, general assistance, and foster care payments, in the past year;
- *Low-income household*, dummy variable set equal to one if the respondent's annual household income is less than \$24,000;
- *Bankruptcy*, dummy variable set equal to one if the respondent ever filed for bankruptcy;
- *In poor or fair health*, dummy variable equal to one if the respondent reported being in poor or fair health;
- *Mental health treatment in past year*, dummy variable equal to one if the respondent reported having gone to a clinic, doctor, or counselor, or outpatient treatment for problems with his or her emotions, nerves, or mental health in the past year;
- *Ever divorced*, dummy variable equal to one if the respondent reported ever having been divorced. This model only includes those respondents who have ever been or are currently married;
- *Ever arrested*, dummy variable equal to one if the respondent reported ever having been arrested; and

- *Ever incarcerated* variable equal to one if the respondent reported ever having been incarcerated. The patron survey does not ask about incarceration; therefore, this model only includes respondents from the RDD survey.

## **Annex 2: Description of Explanatory/Independent Variables**

All of the logistic regression models include the following respondent-specific explanatory variables:

- *Dummy variables for lifetime gambling behavior*, including never gambled in lifetime, gambled with one or two problems in lifetime, gambled with three or four problems in lifetime, and gambled with five or more problems in lifetime, with gambled with no problems in lifetime serving as the excluded base category;
- *Age*, included as a continuous variable in both linear and quadratic forms;
- *Dummy variable for sex*, set equal to one for men and equal to zero for women;
- *Dummy variables for race*, including black, Hispanic, and non-white other, with white serving as the excluded base category;
- *Dummy variables for current marital status*, including married, separated, divorced, and widowed, with never married serving as the excluded base category;
- *Dummy variable for household with children*, set equal to one if the respondent lives in a household that includes at least one child under the age of 18;
- *Dummy variables for educational attainment*, including did not attend 12<sup>th</sup> grade, attended 12<sup>th</sup> grade, attended technical school, attended one to three years of college, and attended four years of college, with attendance at graduate/professional school level serving as the excluded base category;
- *Dummy variables for alcohol and drug use and abuse*: Questions on alcohol and drug abuse were not included in the patron survey; therefore, this set of variables includes four variables specific to respondents to the RDD survey and two variables specific to respondents to the patron survey. The RDD variables are: use of alcohol at least 12 times in the past year; use of at least one drug on five or more days in the past year; abuse of/dependence on alcohol; and abuse of/dependence on drugs. RDD respondents coded as alcohol abusers/dependent and/or drug abusers/dependent are not coded as being alcohol and/or drug users, respectively. The patron variables are use of alcohol at least 12 times in the past year and use of at least one drug on five or more days in the past year;
- *Dummy variable for survey type*, set equal to one if the respondent participated in the patron survey and zero if the respondent participated in the RDD survey; and
- *Dummy variables for region of residence*, including dummy variables for the Midwest, South, West and Missing, with the Northeast serving as the excluded base category.

### **Annex 3: Methodological Notes for Costs**

The following table presents certain values and calculations used to estimate the cost per problem and pathological gambler. Specifically, the estimates of this study compare the rate of costly consequences for these gamblers relative to “predicted” or expected rates for individuals with similar characteristics, but who are low-risk gamblers (they have gambled, but never experienced any symptoms of problem gambling).

Specifically, the analysis adjusts for a standard set of characteristics that are believed to be predictive of the behaviors and outcomes of interest in this report. These factors were identified and the variables were defined in the body of the report. They include age, gender, ethnic identity, educational attainment, use/problems with alcohol and drugs, respectively, and region of the country in addition to variables representing the gambling Type of the individual. The purpose of these calculations is to adjust for basic and systematic differences between different types of gamblers that might be related to the outcomes of interest, rather than simply take the difference in outcomes for pathological and problem gamblers and compare them to those with no history of problems.

The analysis has compared problem and pathological gamblers to low-risk gamblers (never had any problems) rather than nongamblers for several reasons. First, nongamblers have lower rates of problems than low-risk, thus we get more conservative (smaller) cost estimates when we use low-risk gamblers for comparisons. Second, other researchers have found persons that have never gambled to be relatively distinct in their characteristics, e.g., less likely to work outside of the home, more likely to be female, and otherwise more conservative in certain behaviors.

The costs are based on the “excess” or difference between the actual rate and the predicted rate, where the predicted rate is calculated from the “odds ratio.” This yields a smaller or more conservative estimate than simple comparison of problem and pathological gamblers to the unadjusted rates for low-risk and nongamblers.

For all of the costs examined that rate of problems is materially greater for problem and pathological gamblers than for low-risk gamblers (and nongamblers). Costs have only been estimated where the rate for pathological and/or problem gamblers is statistically significantly different (worse) than low-risk gamblers (or alternatively nongamblers). For comparison purposes the rate of consequences/problems for low-risk gamblers is also presented. Note that for all types of consequences except one the “predicted” rate of problems for problem and pathological is greater than the unadjusted rate for low-risk gamblers. This indicates that problem and pathological gamblers on average are more likely to have characteristics that are associated with the consequences of concern, even if they were not problem gamblers. For example, other tabulations have shown that problem and pathological gamblers are more likely to have alcohol and drug problems and lower educational attainment. If these factors are not adjusted for the cost estimates will be somewhat inflated, as having these characteristics (alcohol and drug problems) is generally significantly and negatively related to measures such as divorce, health, and criminal justice involvement (as is the case in the analyses done for this study).

For example, the problem of “job loss” was reported by 13.8 percent of pathological gamblers who had been employed during the prior year, compared to a rate of 4.0 for low-risk gamblers. In the logistical regression the “odds ratio” is 2.62, which means that the odds of pathological gamblers experiencing job loss is 2.62 times greater than for low-risk after adjusting for other characteristics. These data imply that pathological gamblers without their gambling problems would have a predicted rate of 5.8 percent.

This is greater than the value for low-risk gamblers of 4.0 percent, due to the other characteristics which indicate that pathological gamblers are at higher risk of job loss even without the gambling issues.

Predicted rates are estimated from the rates for pathological and problem gamblers, respectively, and their “odds ratios” from multivariate logistical regressions comparing each respective type of gamblers to low-risk gamblers. Odds ratios (and accordingly costs) are only used where problem and pathological gamblers are significantly worse than low-risk gamblers or those that have never gambled at the  $p < 0.10$  significance level (one-tailed test) or better.

**Table 21. Summary of Comparisons Between Pathological, Problem, and Low-Risk Gamblers**

Type of Costly Consequence/Problem	Rate of Consequence per Problem	Odds Ratio Relative to Low Risk	Predicted Rate without Gambling	Rate for Low-Risk Gamblers
<b>Pathological Gamblers</b>				
Job loss	13.8%	2.62	5.8%	4.0%
Unemployment Insurance	15.0%	2.81	5.9%	4.0%
Welfare benefits	4.6%	1.94	2.4%	1.3%
Bankruptcy	19.2%	1.97	10.8%	5.5%
Divorced ever	53.5%	2.29	33.5%	29.8%
Health poor or fair	31.1%	2.43	15.7%	13.9%
Mental health utilization	13.3%	2.12	6.7%	6.5%
Arrested ever	32.3%	2.00	19.3%	11.1%
Incarceration ever	21.4%	4.38	6.3%	4.0%
<b>Problem Gamblers</b>				
Job loss	10.8%	2.07	5.5%	4.0%
Unemployment Insurance	10.9%	2.21	5.3%	4.0%
Welfare benefits	7.3%	3.35	2.3%	1.3%
Bankruptcy	10.3%	1.71	6.3%	5.5%
Divorced ever	39.5%	1.38	32.1%	29.8%
Health poor or fair	16.4%	n.s.	n.s.	13.9%
Mental health utilization	12.8%	2.47	5.6%	6.5%
Arrested ever	36.3%	3.15	15.3%	11.1%
Incarceration ever	10.5%	2.34	6.2%	4.0%

## References

- Blincoe, L., and Faigin, B. 1992. The Economic Cost of Motor Vehicle Crashes. Washington DC: Office of Plans and Policy, National Highway Traffic Safety Administration, U.S. Dept. Of Transportation.
- Everett, C., ed. 1991. The Consequences of Divorce: Economic and Custodial Impact on Children and Adults. New York, The Haworth Press, Inc.
- Frazis, Harley, et al. 1998. Results from the 1995 Survey of Employer-Provided Training. *Monthly Labor Review*, June 1998, v121, n6, pp. 3–13.

- Gropp, R., Scholz, J, and White, M.J. 1997. Personal Bankruptcy and Credit Supply and Demand. *The Quarterly Journal of Economics*, 112(1), February.
- Harwood, H., Fountain, D., And Livermore, G. 1998. Economic Costs of Alcohol Abuse and Alcoholism. In *Recent Developments in Alcoholism*, Vol. 14. Marc Galanter, Editor. Plenum Press, New York and London.
- Lesieur, H.R. 1998. Costs and Treatment of Pathological Gambling, *Annals of the American Academy of Political and Social Science* (Gambling: Socioeconomic Impacts and Public Policy, J.H. Frey, special editor). March 1998.
- Mark T., McKusick, D., King, E., Harwood, H., Genuardi, R. 1998. *National Expenditures for Mental Health, Alcohol and Other Drug Treatment 1996*. For the Substance Abuse and Mental Health Service Administration, DHHS Publication No. SMA 98–3255, Rockville, MD.
- Mincer, J. and Polachek, S. 1978. “Women’s Earnings Re-Examined.” *Journal of Human Resources* 13(1):113-34.
- National Institutes of Health. 1997. *Disease-Specific Estimates of Direct and Indirect Costs of Illness and NIH Update*. Department of Health and Human Services.
- Paringer, L., and Berk, A. 1977. *Cost of Illness and Disease, Fiscal Year 1975*. Washington D.C.: Georgetown University, Public Services Laboratory.
- Thompson, W., Gazel, R., and Rickman, D. 1996. *The Social Costs of Gambling in Wisconsin*. A Report prepared for the Wisconsin Policy Research Institute.
- U.S. Department of Commerce. 1998. *Statistical Abstract of the United States, 1997*. U.S. Government Printing Office, Washington, DC.
- U.S. Department of Justice. 1993. *Correctional Populations in the United States, 1991*. Bureau of Justice Statistics Publication NCJ–142729, Washington, D.C.
- U.S. Department of Justice. 1996. *Sourcebook of Criminal Justice Statistics 1995*. Bureau of Justice Statistics Publication NCJ–158900, Washington, D.C.
- Volberg, R.A., Moore, W.L., Christiansen, E.M., Cummings, W., and Banks, S.M. 1998. Unaffordable Losses: Estimating the Proportion of Gambling Revenues Derived from Problem Gamblers, *Gaming Law Review* 2 (4): 349–360.
- Volberg, R.A. 1998. *Gambling and Problem Gaming in Oregon. A Report to the Oregon Gambling Addiction Treatment Foundation*. Gemini Research, Ltd., Northampton, MA. Also at <http://www.gamblingaddiction.org/oregonreport/frame.htm>
- WEFA Group. 1998. *The Financial Costs of Personal Bankruptcy*. Burlington, MA, February. Available online at <http://www.wefa.com/wefabkr.html>.
- WEFA Group. 1998. *A Study Concerning the Effects of Legalized Gambling on the Citizens of the State of Connecticut*. Burlington, MA.
- Weitzman, L.J. 1985. *The Divorce Revolution: The Unexpected Social and Economic Consequences for Women and Children in America*. New York: The Free Press.
- Westphal, J., Rush, J., and Stevens, L. 1998. *Problem and Pathological Gambling Behaviors Within Specific Populations in the State of Indiana*. A Report to the Indiana Department of Administration and Family Social Services Administration.

Wilson, C.A., as reported in *Marital Status: The Comprehensive On-Line Resource for Divorce and Remarriage*. Internet at: [http://www.maritalstatus.com/divorce/articles/dividing\\_cover.html](http://www.maritalstatus.com/divorce/articles/dividing_cover.html).