FINAL REPORT

THE DEMOGRAPHIC SOURCES OF ONTARIO GAMING
REVENUE

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EXECUTIVE SUMMARY

The source of government gaming revenue has important philosophical, sociological and government policy implications. The legitimacy of government-sponsored gambling and its continued expansion depends in part on the impact that gambling has on society and the extent to which gambling revenue is derived from vulnerable individuals. An argument can also be made that the amount of money spent on treatment of problem gambling should be proportionate to the amount that comes from people with gambling addictions. Unfortunately, the actual proportion of revenue that problem gamblers account for is unclear. Although several studies have investigated this issue, the figures obtained have been inconsistent between studies and inconsistent with actual jurisdictional gaming revenues. These inconsistencies appear to derive from three factors. The first concerns problems in determining the prevalence rate of problem gambling; the second concerns methodological problems in assessing self-reported expenditures; and the third concerns the difficulty in tabulating revenues from people resident in the jurisdiction.

The present study reinvestigated the gaming revenue contributions of Ontario problem gamblers. An attempt was made to exclude out-of-province expenditures as well as revenues from non-Ontario residents. Better methods were used to establish the prevalence rate (better instrument; more exhaustive RDD sampling to achieve a better response rate; adjustments for populations not available for sampling). Improved methodology was used to obtain self-reported net expenditures (prospective 4 week diaries of gambling expenditures; clear, non-biasing questions explaining what is meant by 'net expenditure'). Various methods were used to establish the validity of these self-reported expenditures, including comparison with actual Ontario gaming revenues collected in this time period.

Results showed that:
- The past year prevalence rate of moderate and severe problem gambling in Ontario adults in 2003 is estimated to be 4.8%.
- Retrospective estimates of gambling expenditures tend to be unreliable and strongly influenced by question wording. However, certain question wordings appear to elicit estimates with adequate reliability and validity.
- Data from the prospective diaries tentatively indicates that about 35% of Ontario gaming revenue is derived from moderate and severe problem gamblers, with even higher proportions for gaming machines and horse racing.

The present study contributes to converging lines of evidence indicating that a substantial portion of gaming revenue derives from people who are negatively impacted by their involvement in this activity. An argument can be made that government-sponsored gambling is therefore contrary to the interests of the general populace and contrary to the purpose of government. However, an argument can also be made that the economic benefits of gaming in Ontario may offset the social and economic costs. What is clear is that if government-sponsored gaming is to continue then there needs to be maximum effort to minimize its negative impact (including the disproportionate financial draw from problem gamblers). Ontario does more in this regard than most jurisdictions. However, the present results indicate that considerably more needs to be done.

INTRODUCTION

<u>Importance of Understanding the Demographic Source of Gaming Revenue</u>

Gambling is an important and expanding economic growth industry in Canada. Net revenue from government-run lotteries, video lottery terminals, and casinos rose from $2.7 billion in 1992 to $11.3 billion in 2002 (Statistics Canada, 2003a). Gambling is also a socially acceptable activity, with 76% of Canadians reporting that they gamble at least once in the past year, and 38% on a weekly basis (Statistics Canada, 2003a). It is not surprising to observe such high proportions of gamblers in light of the many gambling opportunities available to Canadians. Lotteries, instant-win tickets, sports betting (Sports Select), gaming machines (video lottery terminals and slot machines), bingo and horse racing are available in every province. In addition, all provinces except New Brunswick, Newfoundland and Prince Edward Island have permanent casinos (Azmier, 2001).

Government's role in gambling varies from country to country. In jurisdictions such as the United States, the government primarily serves as a regulator and receives revenues mostly through taxation of private operators. Canada has much more government involvement than most jurisdictions. Here, provincial governments not only serve as regulators, but are often involved in the actual ownership and operation of gambling and are the primary recipients of revenue from these operations (Azmier, 2001).

Direct government involvement in gambling is a contentious issue, with some people arguing this enterprise is incompatible with serving the best interests of the people. It is clear that there are many positive social and economic benefits to government-sponsored gambling. In addition to being a desirable source of entertainment, it also provides employment for many people and injects large sums of much needed revenue into government and charity coffers (Azmier, Kelley, and Todosichuk, 2001; Wynne and Anielski, 2000). Most of this revenue is then redirected to fund important public services, programs, and facilities (Azmier et al., 2001).

However, not all Canadians benefit from gambling. On the contrary, a minority of Canadians suffer from very serious gambling problems. Nine recent provincial prevalence studies have found rates of problem gambling ranging from 3.1% to 5.9% of the adult population, with an average of 4.2% (Addictions Foundation of Manitoba, 2002; Baseline Marketing Research, 1996; Doiron and Nicki, 1999; Ipsos-Reid & Gemini Research, 2003; Ladouceur, Jacques, Ferland, and Giroux, 1999; New Brunswick Department of Health & Wellness & Focal Research, 2001; Smith and Wynne, 2002; Wiebe, Single, and Falkowski-Ham, 2001; Wynne, 2002). Moreover, the problems associated with pathological gambling, such as marital breakdown, unemployment, mental illness and crime, all place a significant strain on Canada's social infrastructure.

Many governments justify their involvement in gambling by their belief that the social and economic benefits outweigh the negative effects. The argument can also be made that the situation is analogous to alcohol where the government is mandated with regulating and managing a product that is supported by the majority of the population despite having adverse effects for a minority. However, there are a couple of problems with these arguments. First, it is not clear that the benefits of gambling outweigh the negative effects in places that do not attract a substantial portion of their patrons from other jurisdictions (Grinols, 2004). Secondly, unlike

alcohol, most governments have yet to develop or implement effective policies to minimize the harm caused by gambling (Blaszczynski, 2003; Nowatzki and Williams, 2002; Quinn, 2001).

Of final note, and most relevant to the present paper, there has been no thorough or conclusive determination of what proportion of government gambling revenue derives from problem gamblers. Even if effective prevention policies were in place and the benefits of gambling did outweigh the negative effects, important consideration has to be given to the source of the money. It seems doubtful that government alcohol revenue derives primarily from alcoholics due to the fairly low cost of alcohol and limits on how much alcoholics can consume (although we are unaware of any studies investigating this issue). However, this may not be the case with problem gamblers, many of whom lose their homes and entire life savings in relatively short periods of time (Gerstein et al., 1999; National Research Council, 1999; Productivity Commission, 1999). To our minds, the very legitimacy of government-sponsored gambling and its continued expansion hinges on the assumption that a large portion of the revenue does not come from people who are negatively impacted by their involvement in gambling (i.e., problem gamblers).

A second reason to better understand the source of gaming revenues is to shed light on potential ways to minimize the harmful effects of gambling. Even if revenues do come disproportionately from vulnerable individuals, elimination of government-sponsored gambling may not be a viable or appropriate solution. This might just result in gaming activity and revenue being redirected to neighbouring jurisdictions, and the creation of an underground gambling industry to serve problem gamblers. However, a better understanding of the source of gaming revenue could suggest ways to minimize gambling's harmful effects. For example, it would be useful to know whether there are particular forms of gambling whose revenues derive disproportionately from problem gamblers or lower socio-economic levels (so as to limit or eliminate their availability).

A third reason for investigating the source of gaming revenue is to help determine the amount of money that should be spent on prevention, treatment, and research. Ontario spends 2% of gross gaming machine revenue from racetracks and charity casinos on prevention, treatment and research, which represented $36 million dollars in 2003/2004 (OLGC, 2004). Arguably, the amount of money spent on treatment should be somewhat proportionate to the government revenues derived from problem gamblers. If problem gamblers are found to contribute 20-40% of revenues then current spending amounts would appear inadequate.

Inconsistent Findings

Unfortunately, the demographic sources of gaming revenue are not totally clear. Estimates suggest that the top 10% of spenders account for the majority of gaming revenues (e.g., 80% of revenues in Australia) (Gerstein et al., 1999; Nova Scotia, 1999; Productivity Commission, 1999). Yet very little is known about the socioeconomic characteristics of these individuals. People in the gaming industry point to the huge revenues derived from "premium international players", who comprise less than .1% of all gamblers (Walker & Miller, 2001). However, while there is evidence that higher-income households may spend more on gambling, evidence also suggests that lower-income households spend a higher portion of their income on gambling (Marshall, 1998; 2000; Nova Scotia, 1999; Productivity Commission, 1999; Smith &

Wynne, 2000). A recent survey found that Canadian households earning less than $20,000 annually report spending an average of $296 on gaming, or 2.2% of their annual income, whereas households earning $80,000 annually report spending $536, or 0.5% of their total income (Korn, 2000).

Several jurisdiction-wide prevalence surveys have investigated the proportion of revenues derived from problem gamblers. The results of these investigations are reported in Table 1. All of these studies have found problem gamblers to account for a disproportionate share of gaming revenue (Lesieur, 1998; Productivity Commission, 1999; Smith & Wynne, 2000; Volberg et al., 1998; 2001; Williams & Wood, 2004a). However, there has been much less consistency in what that actual portion is. In a comparative study in three Canadian provinces and four American states, Lesieur (1998) found the contribution of problem gamblers to total gaming revenues to range from 23% to 41%, with an average of 30%. A U.S. national survey estimated that problem gamblers account for only 15% of revenues (Gerstein et al., 1999). An Australian study of this issue estimated that problem gamblers account for about 33% of gambling revenues in that country (Productivity Commission, 1999). A New Zealand study estimated that problem/pathological gamblers were responsible for approximately 19% of gaming expenditure (Abbott & Volberg, 2000). A recent Canadian study by Williams & Wood (2004a) found a range between 6% and 38% depending on the province, with an average of 23%. All of these studies also found that the proportion of revenues derived from problem gamblers was very much dependent on the type of gambling (Lesieur, 1998; Nova Scotia, 1999; Productivity Commission, 1999; Volberg et al., 1998). Volberg et al. (2001), using information from six recent U.S. state surveys, estimated the proportion to be 14% for lotteries, 19% for pari-mutuel betting, 25% for bingo, 26% for VLT/slot machines, and 27% for casino table games.

It is unclear whether the variability in the above estimates reflects measurement error or true differences in the proportion between different jurisdictions. However, the fact that the proportion of revenue from problem gamblers bears a strong linear relationship to the respective rates of problem gambling in each of these countries lends some support to the contention that these differences are real.

However, a more worrisome inconsistency concerns the difference between self-reported expenditures and actual government gaming revenues. These inconsistencies comprise cases of over-estimation as well as under-estimation. In Washington State, for example, Volberg et al. (1998) found that reported losses were 2 to 10 times higher than government revenues, depending on the type of gambling. In the study of Canadian provinces by Williams & Wood (2004a), self-reported expenditures were 2.1 times higher than actual provincial gaming revenues in that time period. In contrast, Australian and New Zealand studies have found self-reported expenditures to be between ½ to ¾ of actual revenues (Abbott & Volberg, 2000; Productivity Commission, 1999). In a recent study of Ontario residents, severe problem gamblers report winning significantly more than moderate problem, at risk, and non-problem gamblers, but claim not to have lost any more than other gamblers (Wiebe et al., 2001). In the national survey of Americans by the National Opinion Research Center, gamblers reported being ahead $3 billion at the casinos in the past year instead of having left more than $20 billion, the revenues reported by the casino industry. Gamblers also reported being ahead $2 billion at the racetrack and $4 billion in private gaming. Only when it came to lotteries did they admit to a loss of $5 billion (Gerstein et al., 1999).

Table 1. Jurisdictional Estimates of Proportion of Revenue from Problem Gamblers

Jursidiction	Prevalence of Past Year Problem Gamblers	Proportion of Revenue from Problem Gamblers
Australia (Productivity Commission, 1999)	4.9% SOGS (3+)	33%
4 U.S. States and 3 Canadian Provinces (Lesieur, 1998)	N/A	30% (range: 23-41%)
Canadian Provinces (Williams and Wood, 2004a)	4.6% CPGI (3+) or SOGS (3+)	23% (range: 6-38%)
New Zealand (Abbott and Volberg, 2000)	1.3% SOGS (3+)	19%
United States (Gerstein et al, 1999)	.5%; DSM-IV (3+)	15%

Reasons for Inconsistent Findings: Problems with Determining the Prevalence Rate of Problem Gambling

False Positives

The prevalence rate of problem gambling will directly impact on the proportion of revenue that is derived from problem gamblers.   Almost all studies that have estimated revenues derived from problem gamblers have identified problem gamblers using the South Oaks Gambling Screen (SOGS). This instrument was designed principally for use in clinical settings rather than epidemiological work. Clinical screening measures typically try to guard against false negatives, at the expense of creating an excess of false positives. Compounding this false positive bias is the way in which the SOGS computes prevalence rates to include people who have had a problem in the past, in addition to people currently with a problem (Dickerson, 1993; Walker & Dickerson, 1996). The inclusion of both current and past problem gamblers stems from the assumption that problem gambling is an enduring, chronic problem, whereas current evidence suggests it may be transient for some (Abbott, Williams, & Volberg, 1999; Wiebe, Single, Falkowski-Ham, 2003). In recognition of this, the SOGS-Revised was developed, that also asks about "current gambling problems" (past 6 or 12 months). Although the SOGS-R produces fewer false positives, evidence indicates it still has a significant false positive bias relative to other instruments or clinical interviews (Abbott & Volberg, 1996; Ladouceur et al., 2000; Ferris & Wynne, 2001).

A high false positive rate is a particularly problematic issue when investigating gaming expenditures and revenues. Overestimates of problem gambling among the general population will produce an inflated estimate of the proportion of gambling revenues stemming from problem gamblers. This, in turn, will lead to an underestimate of the average net expenditure of individuals who actually are problem gamblers. Thus, in examining the relationship between problem

gambling and gambling revenues, it is imperative to utilize a measurement that keeps false positive assessment to a minimum.

False Negatives

Participants' responses to questions are often shaped by their perception of how positively or negatively others (particularly the interviewer) will evaluate their behaviour (Fowler, 1993). This is particularly true of sensitive issues, which would presumably include gambling behaviour. As evidence of this, an Australian study of 401 problem gamblers in treatment found that only 29% of them indicated they would have participated in a survey and answered questions about their gambling honestly before seeking help (Productivity Commission, 1999).

Different prevalence rates will be obtained with different methods of survey administration. There is consistent evidence that the validity of self-report is enhanced using procedures that enhance anonymity (e.g., Aquilino, 1997; McAllister and Makkai, 1991; Supple et al, 1999; Tourangeau and Smith, 1996; van der Zouwen and de Leeuw, 1990).
Evidence of this is seen in a recent large face-to-face survey of problem gambling in Canada (Canadian Community Household Survey 1.2; Statistics Canada, 2002). The prevalence rates for problem gambling were less than half the rates obtained by means of several provincial surveys conducted in 2001 and 2002, despite using the same instrument (Canadian Problem Gambling Index). The difference is most likely attributable to the face-to-face format of the CCHS versus the more anonymous telephone administration of the provincial surveys.

Under-Sampling of Problem Gamblers

Most studies reporting gambling expenditures have employed telephone surveys. While this procedure does have its advantages, it also has its problems. For one, it almost certainly results in an under-representation of problem gamblers, as they are more likely to have the phone disconnected; more likely to be in residential treatment; more likely to be in prison; less likely to answer the phone; and perhaps less likely to be at home (Ferris, Wynne & Single, 1999; Lesieur, 1994; Walker & Dickerson, 1996). A Swedish national survey found that the rates of probable pathological gambling were 3 times higher for people who could not be contacted by telephone, but did complete survey information by mail (Rönnberg, Volberg, Abbott, et al., 1999). Surveys of residential treatment facilities have typically yielded probable pathological gambling prevalence rates 2 to 4 times higher than those obtained from general adult population surveys (Abbott & Volberg, 1999).

Reasons for Inconsistent Findings: Problems with the Methodology Used to Obtain Self-Reported Expenditures

Ambiguous Question Wording

Exactly how a question is worded strongly shapes the reply (Schwarz, 1999). Virtually all studies have obtained self-reported expenditures as part of a telephone survey investigating the prevalence of problem gambling in their particular jurisdiction. Certain questions in these surveys have asked people how much they spend on a specific gambling activity in a "typical" month. Figures for each activity are then added up to arrive at a typical monthly expenditure.

The usual intent of these questions is to obtain an estimate of the respondent's <u>average net</u> monthly gambling loss or win (i.e., the amount of money they have at the end of the month compared to the beginning of the month). However, even among educated medical students, only 32% to 64% interpret "how much do you spend gambling?" to mean <u>net</u> expenditure (Blaszcynski, Dumlao, & Lange, 1997). Many interpret it as initial outlay or total outlay (initial outlay + reinvestment of winnings). Volberg et al. (1998) have speculated this was the interpretation in the Washington state study where self-reported estimates were 2-10 times higher than revenues. Blaszcynski et al. (1997) also found that some people include travel and meal costs when calculating gambling expenditures.   Also problematic, it is unknown whether people interpret "typical" as mean, median or modal expenditures. It is quite plausible that people believe "typical" to mean their usual (modal) expenditure, rather than their statistical average that takes into account occasional large losses.

Social Desirability Bias

As mentioned earlier, the validity of reports concerning sensitive subject matter is strongly influenced by respondents' perceptions of the social desirability of their behavior (Fowler, 1993; Schaeffer, 2000; van der Heijden et al, 2000). The question wording that conveys the clearest meaning is not necessarily the one that obtains the most valid answers. The National Opinion Research Center study (Gerstein, Volberg et al., 1999) is one study that asked respondents whether they had "come out ahead or behind on your gambling", with the choices being "ahead, behind, or broke even". With this wording, a majority of people reported winning rather than losing money in the past year.

Most studies asking about expenditures have asked people how much they "spent" in the past month. While this may counteract the social desirability bias, it would potentially also bias people toward reporting losses rather than wins. Although losses are much more common than wins, there are a few gamblers who do come out ahead (e.g., infrequent gamblers, lottery winners, professional sports handicappers, professional poker players). Moreover, if gambling activities also include the stock market, as they do in several of these surveys, then many more people are "winners". Not only do people minimize their losses, but there is evidence that people tend to exaggerate their wins and losses to convey the impression they are high rollers (Ruehlman, 2001).

Fallible Memory

Even if people correctly interpret question wording, and even if question wording does not bias them, their ability to accurately provide average net monthly win/loss is doubtful. This is a difficult statistical calculation to make in a few seconds that most researcher-administered surveys provide. The fact is that these figures are usually not available and the person is just relying on their memory of these expenditures to make these calculations. Even if people are encoding their daily/weekly/monthly expenditures in terms of net win/loss, memories have differing valence, making them more or less available for retrieval (Tourangeau, 2000). Indeed, selective memory is a characteristic and well-documented feature of problem gambling (McCusker & Gettings, 1997; National Research Council, 1999; Toneatto, 1999; Toneatto, et al., 1997).

Seasonality of Gambling Behaviour

It is a well-established fact that much human behaviour has seasonal variations

(Uitenbroek, 1993). There are seasonal variations in criminal behavior (Cohn, 1990), mood (Wehr & Rosenthal, 1989), suicide (Araki and Murata, 1987), substance use (Cho et al., 2001; Kovalenko et al., 2000), and sexual activity (Rodgers et al, 1992). Although there is no published literature on this topic, the seasonal nature of gaming revenues is well known to casino and lottery operators. Revenues tend to be higher in the summer and lower in the fall (particularly noticeable in jurisdictions that attract tourists) (Fenney, 2001). Thus, gambling studies that sample respondents at a single time point overlook the potentially seasonal nature of gambling activity. This could partly account for some of the variability in prevalence estimates or gambling expenditures. Further studies need to employ a sampling strategy that can mitigate the impact of seasonal trends.

Reasons for Inconsistent Findings: Problems in Tabulating Jurisdictional Gaming Revenues

Out-of-Jurisdiction Revenue and Expenditures

The ability to validate self-reported expenditures against actual revenues depends on the extent to which residents are gambling in their own jurisdiction and the extent to which revenues are derived primarily from within-jurisdiction residents. Certain jurisdictions (e.g., Las Vegas) derive most of their revenue from out-of-state residents. In places with limited gambling opportunities it might be expected that many residents travel to other jurisdictions to gamble. A comparison between expenditures and revenues is possible only if there is accurate information concerning the percentage of gaming that residents engage in out of jurisdiction and the percentage of revenues derived from out-of-jurisdiction residents. Australia derives a significant portion of their gaming revenue from Asian customers (CNN, 2001), which might help explain why Australian self-reported expenditures fall short of Australian gaming revenue.

Not Reporting all the Revenue

It is possible that in some jurisdictions not all gaming revenue is reported to the regulatory authorities. This could be done to reduce taxes by the owners/operators or could be the result of embezzlement or 'skimming' by employees. It is unclear how serious or pervasive a problem this is. However, the potential for these problems exists in any commercial enterprise with a high turnover of cash.

Using Improved Methodology to Investigate this Issue

Thus, the primary intent of the present project was to reinvestigate the gaming revenue contributions and spending patterns of problem gamblers in Ontario using improved methodology:

Better Assessment of the Problem Gambling Prevalence Rate

Using a more appropriate instrument will improve the accuracy of the problem gambling prevalence rate. As opposed to being developed for use in clinical settings, the Canadian Problem Gambling Index (CPGI) was designed to assess gambling behaviour in general populations and is

geared towards the gambling opportunities available in the Canadian context (Ferris and Wynne, 2001). According to Ferris and Wynne (2001), who developed the CPGI, the instrument produces a reasonably high level of reliability. Moreover, it is characterized by high levels of face, criterion, and construct validity (Ferris and Wynne, 2001), and should produce relatively few false positives. Prevalence studies suggest that problem gambling exists on a continuum (e.g. Productivity Commission, 1999). Thus, another attractive feature of the CPGI is that its 4 levels of gambling (Severe Problem, Moderate Problem, Low Risk, Non-problem Gambler) make it less categorical than other instruments (e.g., DSM-IV), and render it more accommodating to the continuous nature of problem gambling.

Better sampling techniques will also improve the accuracy of the prevalence rate. Random digit dialling telephone sampling is the most common way of conducting prevalence studies. This procedure has excellent potential to be a good sampling technique due to the high percentage of households with telephone service (98.8% in Ontario; CRTC, 1999). However, survey firms vary widely in the procedures they use and resultant ability to achieve good response rates and true random sampling. A prevalence study of problem gambling in the Ontario populace was conducted in 2001 using the CPGI (Wiebe, Single and Falkowski-Ham, 2001). However, the validity of these rates is uncertain due to a low response rate. Response rates can be improved with more attempts to contact the designated person, a longer sampling period, more sampling during the evenings and weekends, shorter surveys, and recontacting refusals at a later time.

Even the most rigorous and exhaustive RDD sampling typically achieves differential response rates depending on age (fewer young people), gender (fewer males), and ethnicity (fewer ethnic minorities due to language difficulties). Giving appropriate weightings to these characteristics is sometimes not done in prevalence studies, but is necessary in order to approximate the true population prevalence. In addition, adjustments to the prevalence rate also need to be made to take into account individuals not available for sampling because of incarceration, being in a residential treatment facility or serving at an Armed Forces base at the time of the survey.

In the present study, all of these features were incorporated into the RDD protocol.

Better Assessment of Self-Reported Expenditures

Prospective diaries involve participants recording relevant behaviors or experiences in a logbook or diary, on a daily basis, for a certain period of time. There is substantial support for the contention that prospective diaries provide the most valid data concerning sensitive and socially undesirable behaviour (e.g., unsafe sex, alcohol use). They consistently produce higher estimates of sensitive and socially undesirable behaviour than do retrospective diaries or global estimates, and they also come closest to matching objective measures of the behaviour when they have been available (e.g., per capita alcohol revenues) (Carney et al., 1998; Corti et al., 1990; Lemmens, Tan & Knibbe, 1992). It is thought that the self-administered format enhances anonymity and the daily recording of behaviour minimizes memory demands. Thus, the present study investigated the utility and validity of obtaining reports of gambling expenditure by means of -week prospective diaries. Included in these diaries were very explicit and clear instructions on what constituted 'net expenditure'.

Unfortunately, prospective diaries are a very time consuming way of obtaining gambling expenditures and cannot be routinely used in survey research. Thus, a secondary purpose of the

present project was to compare the results of 12 different versions of a question inquiring about the person's retrospective estimate of past month gambling expenditure against the amounts obtained by means of prospective diary. The version that comes closest could potentially be used in future survey research.

Better Tabulation of Ontario Expenditures and Revenues

   The present study will assess all gambling expenditures and eliminate spending that does not contribute to documented Ontario revenue (out-of-province casinos; internet betting; betting with friends; speculative stock market investments). Similarly, when tabulating government, charity, and horseracing revenues, an attempt will be made to determine the percentage of revenue derived from out-of-province residents and exclude this amount from the total.

METHOD

Telephone Survey

The Institute for Social Research (ISR) at York University was contracted to conduct a random digit dialling telephone survey of 6654 Ontario adults using a computer-assisted telephone interview (CATI). The following procedures were used to ensure optimal random sampling and valid self-report:

- The telephone number databank from which numbers were randomly drawn included unlisted numbers (12.4% of Ontario households have unlisted numbers), and excluded cell phones to prevent multiple sampling of the same household.
- The household interviewee was randomly determined by requesting the interview be conducted with the adult (18+) having the next birthday.
- Maximal effort was made to complete an interview with the randomly designated person.
  - There were exhaustive attempts to contact the person. In some cases this meant phoning 36 times over several months to establish contact.
  - The majority of the phoning occurred in the evening and on weekends.
  - Most refusals were contacted again at a later time and asked to reconsider doing the survey.
  - The survey was kept very short to increase the chances the person would participate (5.5 minutes for screener and 9.6 minutes for full interview).
- Phone calls were spread over a 9 month period, from March to November 2003, to mitigate against seasonal fluctuations in gambling behaviour and to maximize the chances of contacting the person.
- The interviewer's work received periodic visual and audio monitoring for quality control by a supervisor.
- The need for honesty was stressed at the beginning of the interview.

The survey itself (Appendix A) had six sections:

1. Eligibility Question

The person was first asked how much money they had spent in a typical month in the past year on lottery, raffle or instant win tickets; playing Sports Select; playing slot machines and table games at Ontario casinos and racetracks; horse race betting; and bingo. People who indicated $9 or more were administered the entire 10 minute survey. People who indicated less than $9 were just administered the 5 minute Demographics Section.

2. Retrospective Gambling Expenditure Question

People were randomly administered one of 12 different questions asking for a retrospective estimate of gambling expenditures. Each of these questions used different wordings. The following indicates the various segments of the question that were manipulated:

Roughly how much money do/did you	spend	on gambling		in a typical month?	What we mean here is how much you are ahead or behind, or your net win or loss.
		in total on lottery, raffle and instant win tickets, Sports Select, slot machines and table games at Ontario casinos and racetracks, horse race betting, and bingo		last time you purchased/played (this activity)?; How often do you purchase/play (this activity)?	
	come out ahead or behind		on specific gambling activity (8 different types)		

The validity of the responses for each question was established in a couple of ways. First, by comparison of the aggregate expenditures of that version of the question to actual Ontario gaming revenues. Secondly, by comparison of the aggregate expenditures of that version of the question to the aggregate expenditures of the prospective diaries (assuming the prospective diary expenditures are a better indication of true expenditures).

3. Canadian Problem Gambling Index

The nine questions from the Canadian Problem Gambling Index that determine problem gambling status were asked. This was done both to establish the prevalence rate of problem gambling in Ontario and to determine whether the person would be asked to complete a prospective diary of gambling expenditure.

4. Reliability Question for Retrospective Expenditure

The reliability of the answer on the Retrospective Gambling Expenditure Question was assessed by adding a tenth question to the CPGI that asked the person whether they had spent an amount gambling in the past year that was at least 2/3rds of what they had reported earlier (a computer algorithm determined what this amount was and rounded it off). It was hoped the person would believe this question to be a routine part of the CPGI because it was asked right after the other 9 CPGI questions, because it used the same phraseology as the other CPGI questions, and because it asked about past *year* spending (the Retrospective Estimate question asked either about past month or past day spending). People who failed to endorse that their spending was at least 2/3rds of what they had reported earlier were excluded from some of the subsequent analyses. (People who reported *winning* money were not asked this reliability question).

5. Demographics Section

People were asked their age, gender, postal code, number of adults in the household, marital status, race/ethnicity, highest level of education completed, household income, and

household debt.

6. Prospective Diary

One of the primary purposes of the RDD prevalence study was to provide the basis for selecting a random sample of individuals from each of the 4 categories of the Canadian Problem Gambling Index to complete the prospective diary of gambling expenditure. Once the gambling category of the person had been established during the telephone interview, then a determination was made about whether the person would be asked to complete a 4-week diary of gambling expenditures (and receive $50 in reimbursement). All severe problem gamblers and most moderate problem gamblers were asked due to their low prevalence rate. A small percentage of the nonproblem gamblers and low risk gamblers were randomly selected for this request. Requests continued until 100 completed diaries per group were met or all 6654 telephone interviews had been completed, whichever came first.

Prospective Diary

People who agreed to complete the prospective diaries were sent four 1-week diaries (Appendix B) and four pre-paid envelopes. They were instructed to record their gambling activities starting on the first Monday after receiving the package and to continue for 4 consecutive weeks. Each day of the diary asked whether there had been any gambling activity or not. If there was, the person was asked to identify the type of gambling, the time spent, and their net win/loss. Clear and complete instructions on how to calculate net daily wins or losses was provided for different types of gambling. At the end of each week the person was asked to mail their completed diary to the Institute for Social Research. As a reminder, each Sunday someone from the ISR phoned the person to remind them to send the diary in. Participants were sent a cheque for $50 upon receipt of all four diaries. The diaries were then sent to the University of Lethbridge where their content was tabulated.

As a reliability check, the person was asked to estimate their total household income and current household debt in week 4 of the prospective diary. Individual's whose estimates were not within 33% of what they had reported in the telephone interview were excluded from some of the analyses.

Research Questions & Hypotheses

1. What is the prevalence rate of problem gambling in Ontario using optimal RDD assessment methodology and adjusting for individuals not available for sampling? Our hypothesis is that the prevalence rate will be higher than previously reported. A secondary question concerns the average number of attempts it takes to contact problem gamblers compared to nonproblem gamblers Our hypothesis is that the average number of phone attempts will be significantly higher.
2. Which retrospective gambling expenditure question will provide the most valid estimate of true expenditures? Our hypothesis is that questions that ask about aggregate expenditures on

all types of gambling will produce lower estimates than questions that ask about expenditure on each type of gambling. We also predict that questions that ask about 'win/loss' will produce lower estimates than questions that ask about 'spending'.

3. Which method of determining net monthly expenditures (retrospective estimates, or the prospective diary) yields the most valid estimate of the net expenditures of gamblers based on comparison with actual provincial gaming revenues? Based on previous research, our hypothesis is that the prospective diary will be the most valid.

4. Based on the most valid estimate of expenditures, what proportion of gaming revenue in Ontario derives from moderate and severe problem gamblers? Our hypothesis is that problem gamblers will account for a disproportionate share, but the actual proportion is uncertain.

5. Which forms of gambling derive the greatest proportion of revenue from problem gamblers? Our prediction is that continuous forms of gambling (i.e., slot machines, VLTs) and casino games will derive their revenues from problem gamblers to a greater extent than other forms of gambling.

6. How does the amount of money the Ontario government spends on treatment of problem gambling compare to the amount of money derived from problem gamblers? Our hypothesis is that government spending will represent only a small fraction of the money derived from problem gamblers.

RESULTS

Prevalence Rate of Problem Gambling

CASRO Response Rate

The most appropriate method of calculating response rates is the one recommended by the Council of American Survey Research Organizations criteria (CASRO, 1982). Essentially, this is the number of completed interviews divided by the number of eligible telephone numbers. All of the following are deemed to be eligible telephone numbers: completed interviews; refusals; prematurely terminated interviews; numbers that are known to be eligible residences (e.g., by means of an answering machine message) that never answer; individuals who are not able to do the interview because of being too ill, not mentally competent, or because of language problems; and telephone numbers that are never answered and whose eligibility cannot be determined (this latter number is multiplied by the fraction of telephone numbers that the survey generally found to be eligible). An overall response rate of 51% was achieved for the telephone survey using this method of calculation.

Contrary to our expectation, problem gamblers were no more difficult to reach than nonproblem gamblers. The correlation between the person's CPGI score and the number of phone calls to establish contact was $r = -.02$, NS. The average number of attempts to establish contact for the entire sample was 5.2 (median = 4; mode = 1). For the moderate and severe problem gamblers the average number of attempts was 5.7 (median = 4; mode = 1). Ninety-five percent of the total sample was contacted within 15 phone calls. Ninety-five percent of both moderate problem and severe problem gamblers were contacted within 16 phone calls.

Weighting the Sample

The representativeness of the sample was assessed by comparing characteristics of the RDD sample against Statistics Canada census data for Ontario adults (18+) in 2001 (Statistics Canada, 2001a). The Statistics Canada data is considered to be the 'gold standard' because it assesses the entire Ontario population, achieves a very high response rate, and its self-administered format is more conducive to valid self-report. Weightings were assigned to the RDD sample to approximate the general Ontario population in terms of age, gender, and ethnicity. In addition, each case was given a 'household weighting' to offset the unequal probabilities of being selected for the interview in a one-person household, versus two-person, three-person, etc.

Unadjusted Prevalence of Problem Gambling in Ontario

There were approximately 9,441,668 Ontario residents 18 and older in 2003 (Statistics Canada, 2004). Of these, the prevalence survey estimated that approximately 87.78% were either nongamblers or nonproblem gamblers; 7.51% were low risk gamblers; 3.74% were moderate problem gamblers; and .99% were severe problem gamblers.

Adjusted Prevalence Rate

A portion of the Ontario adult population was not available for sampling because of attending a residential treatment facility, incarceration, or serving at an Armed Forces base at the time of the survey. An examination was made concerning whether this would have any impact on true prevalence rates of problem gambling.

In 1996/97 there were approximately 174,279 health care and long-term care beds in Ontario (Statistics Canada, 1999). Roughly 7,000 of these are for psychiatric patients and/or substance abusers, who are known to have significantly higher rates of problem gambling (Crockford & el Guebaly, 1998; Spunt, 2002; Spunt et al., 1998). On the other hand, it is to be expected that the majority of people in long-term care facilities are frail elderly people with significantly lower rates of gambling and problem gambling. The higher and lower rates in these two subsets may offset each other. It is difficult to speculate on the rates of problem gambling in beds not occupied by these two groups. Thus, for the present analysis, it would seem that there is no compelling justification for adjusting the problem gambling prevalence rate because of not having sampled people from residential treatment/care.

In 2001 there were approximately 7,850 adults incarcerated in Ontario correctional facilities (Statistics Canada, 2001b). Research indicates that approximately 33% of these individuals can be expected to meet criteria for problem gambling (Williams, Royston & Hagen, in press). In 2003 there were approximately 10,000 adults serving in Canada's Armed Forces in Ontario bases. The prevalence rate of problem gambling is unknown, but likely higher than average due to higher rates of male gender and depression (Statistics Canada, 2003b). For the purposes of this analysis, it will be assumed that the rate is 1.5 times the rate in the general population: 7.1%. Thus, among incarcerated individuals and members of the Armed Forces, there is estimated to be approximately 3301 problem gamblers out of a population of about 17,850. Factoring this in to the overall prevalence rate for Ontario has only a very small effect, increasing the rate from 4.73% to 4.76%, or 449,423 individuals.

Even if some of these above estimates are considerably higher or lower than projected, it is evident that there are too few people attending a residential treatment facility, incarceration, or serving at an Armed Forces base to have any significant impact on the prevalence of problem gambling in the general Ontario population (i.e., even if all of these people were problem gamblers the overall prevalence rate would only increase by 0.2%).

As expected, this **prevalence rate of 4.76%** is higher than both the 3.8% obtained by Wiebe et al. in 2001 and the 2.0% obtained by the Canadian Community Household Survey (CCHS 1.2) in 2002. Table 2 reports the prevalence rate for each group. Table 3 reports the demographic characteristics of each group. No statistical analysis of demographic characteristics has been carried out. Nonetheless, it would appear that problem gamblers are more likely to be male, of Aboriginal descent, single or divorced, have lower family income, and have less education.

Table 2. Prevalence of Problem Gambling in Ontario using the CPGI

Category	Percentage	Projected Number in the General Ontario Adult Population
Nongamblers and Nonproblem gamblers CPGI 0	87.75%	8,283,175
Low Risk Gamblers CPGI 1-2	7.51%	709,069
Moderate Problem Gamblers [1] CPGI 3-7	3.76%	355,007
Severe Problem Gamblers CPGI 8+	1.00%	94,417

1. The Moderate Problem Gambling category is also known as the Moderate Risk Gambling category. We believe the 'moderate problem gambling' description is more appropriate for two reasons. The first concerns comparability to other instruments, as people who score 3 to 7 on the CPGI most typically score in the 'problem gambling' range on the SOGS (3 to 4) and people who score 8 and above on the CPGI tend to score in the 'pathological gambling' range on the SOGS and DSM-IV. Secondly, almost everyone scoring 3 and above on the CPGI is reporting problems associated with their gambling. In the present study (as well as other CPGI studies), this most commonly is: feeling guilty about gambling, chasing losses, and betting more than they can afford to lose. Score distributions for the CPGI and SOGS show gambling to exist on a continuum with problem and pathological gambling with no clear pattern of scores or symptoms clearly differentiating 'problem gamblers' from nonproblem gamblers. Thus, self-report of 'problems' would appear to offer the best method of making this demarcation.

Table 3. Demographic Characteristics of the Four Categories of Ontario Gamblers.

	Nongamblers and Nonproblem gamblers (CPGI 0)	Low Risk Gamblers (CPGI 1-2)	Moderate Problem Gamblers (CPGI 3-7)	Severe Problem Gamblers (CPGI 8+)
Age	44.5 (16.6)	39.4 (17.1)	39.9 (15.1)	40.1 (14.5)
Gender	43.6% male	56.4% male	60.7% male	61.6% male
Race/Ethnicity [1]	69.7% European-Canadian 7.0% Asian-Canadian 1.6% Aboriginal 20.2% Canadian 1.4% Other	73.0% European-Canadian 6.3% Asian-Canadian 2.8% Aboriginal 16.8% Canadian 1.1% Other	73.8% European-Canadian 6.0% Asian-Canadian 1.8 Aboriginal 17.4% Canadian 1.0% Other	65.9% European-Canadian 6.2% Asian-Canadian 7.0% Aboriginal 16.2% Canadian 5.0% Other
Marital Status	59% married or common-law 19% widowed, divorced, or separated 21% single (never married)	56% married or common-law 17% widowed, divorced, or separated 27% single (never married)	52% married or common-law 21% widowed, divorced, or separated 26% single (never married)	40% married or common-law 28% widowed, divorced, or separated 30% single (never married)
# Adults in Household	2.0 (0.9)	2.2 (1.0)	2.1 (0.9)	2.3 (1.1)
Household Income	$70,980 (55,482)	$70,289 (59,811)	$60,801 (46,745)	$58,536 (73, 264)
Level of Education	61.4% some education beyond high school	42.4% some education beyond high school	43.2% some education beyond high school	35.1% some education beyond high school
Median Retrospective Estimate of Past Month Gambling Expenditure [2]	0	-$20	-$50	-$200
Average Retrospective Estimate of Past Month Gambling Expenditure[2]	+$10 (16)	-$496 (10,268)	-$615 (4,905)	-$6327 (36,803)

1. Primary ethnic/racial group as identified by the respondent.
2. This is just for the 2528 individuals who reported spending more than $9 in a typical month on gambling. Numbers in brackets are standard deviations.

Ontario Gaming Revenues from Ontario Residents in 2003

The Ontario provincial government owns, operates, and collects the revenue for all lotteries, instant win scratch tickets, sports betting (Pro Line, Point Spread, Pro Pick), linked satellite bingo, gaming machines, and casinos (except for the one Aboriginal casino). The business management of these gaming operations is conducted by the Ontario Lottery and Gaming Corporation (OLGC). The OLGC divides these operations into 'Lottery Products & Satellite Bingo'; 'Commercial Casinos'; 'Charitable Casinos'; and 'Slots at Racetracks'. There are 3 large commercial casinos whose revenues go to the provincial government (Casino Windsor, Casino Niagara, and Casino Rama); 5 smaller charity casinos whose revenues are used to support charities (Brantford Charity Casino, Point Edward Charity Casino, Casino Sault Ste. Marie, Thousand Islands Charity Casino, Thunder Bay Charity Casino, Great Blue Heron Charity Casino (gaming machines only)); and gaming machines at 15 horserace tracks. Table 4 reports OLGC gaming revenues for fiscal year April 2002 to March 2003. These are revenues after prizes and winnings are deducted, but before operating expenses (e.g., salaries, marketing, building maintenance, etc.). Nongaming revenue (e.g., food, alcohol; licensing fees, etc.) is not included.

Only a portion of this revenue is from Ontario residents however. In 2000 it was reported that approximately 42% of the 38 million patrons to OLGC facilities were U.S. visitors (OLGC, 2000). Table 4 projects expenditures for Ontario residents assuming that roughly 58% of the expenditures derive from Ontario residents and that the proportion of U.S. patrons in 2003 is unchanged. (A small percentage of visitors also come from other provinces or from outside North America, but this figure was not available).

Charitable organizations own, operate and collect the revenue for bingo, raffles, and break-open tickets. The Alcohol and Gaming Commission of Ontario (AGCO) is responsible for the regulation of all charitable gaming (and OLGC gaming). It estimates that the gross wager on charity bingo, break-open tickets, and raffles was $1,775,000,000 in fiscal year 2002/2003, and that net revenues were $563,000,000 (AGCO, 2003).

Ontario horse racing is regulated and supervised by the Canadian Pari-Mutuel Agency (CPMA). The CPMA reports that Ontario racetracks (on and off-track) had gross wagers of $1,205,193,343 in the calendar year 2003. Twenty three percent of these wagers are deducted from the pari-mutuel pool and are thus 'lost' by bettors: $277,194,500.

There is one Native owned casino (Great Blue Heron). It's gaming machines are owned and operated by the OLGC. However, revenue from the 50 table games goes directly to the band. Revenue from the Great Blue Heron's table games was unavailable. However, based on per table revenues at the other charity casinos, annual revenues are estimated to be approximately $20,000,000.

Table 4. Ontario Gaming Revenues (after prizes/winnings but before operating expenses).

	Total Revenue	Estimated Revenue from Ontario Residents
Gaming Machines [1]	$3,135,660,000	$1,818,682,800
Lottery Products & Satellite Bingo [1]	$1,074,080,000	$1,074,080,000
Casino Table Games [1]	$494,219,000	$286,647,000
Bingo, Raffles, Break-Open Tickets [2]	$563,000,000	$563,000,000
Horse Racing [3]	$277,194,500	$277,194,500
Aboriginal Casino [4]	$20,000,000	$18,000,000
TOTAL	$5,564,153,500	$4,037,603,000

1. As reported by OLGC in fiscal year 2002/2003. Lottery & Satellite Bingo revenue before prizes were deducted totalled $2,208,776,000.
2. As reported by AGCO in fiscal year 2002/2003.
3. As reported by CPMA in calendar year 2003.
4. Projected revenue based on per table revenue in other charity casinos.

Thus, total gambling expenditures by Ontario residents in 2003 is estimated to be $4,037,603,000. As there are approximately 9,441,668 adults (18+) in Ontario in 2003, the average yearly reported expenditure should be $427.64 and the average monthly expenditure should be $35.64. There is some degree of uncertainty in this figure due to the imprecision in calculating revenues coming exclusively from Ontario residents. However, the figure does not need to be exact, as its prime utility is to serve as a rough reference point to help validate self-reported expenditures.

Retrospective Estimates of Gambling Expenditure from the Telephone Survey

A total of 2528 people were administered one of the 12 different versions of the question that asked about past month gambling expenditure. A total of 2424 people provided answers. Table 5 below reports the mean, median, and modal expenditures for each of the 12 groups. Because the sample sizes are relatively small, the averages are significantly impacted by a few individuals reporting very large losses or wins (maximum reported monthly loss of $250,000; maximum reported win of $90,000). Thus, average expenditures are also calculated when:
   a) Winsorizing the top and bottom 1% of the data for each question (i.e., replacing the values with the next highest or lowest value plus one).
   b) Trimming (deleting) the top and bottom 1% of the data for each question.
   Also, in an attempt to improve the reliability and validity of the data, average expenditures are also calculated when:
   a) Eliminating anyone who failed the reliability question (i.e., failed to endorse that their yearly spending was at least 2/3rds of what they had reported earlier in the interview).

Because people who reported winning money were not asked the reliability question, they were also excluded in these figures.

b) Eliminating anyone who reported winning money or breaking even.

Table 5. Self-Reported Past Month Gambling Expenditure for Each Retrospective Expenditure Question.

Question	N	Average	Average (top & bottom 1% winsorized)	Average (top & bottom 1% trimmed)	Average (unreliable & winners removed)	Average (only people reporting losses)	Median	Mode	% breaking even	% winners	% reporting losses more than $1000	% reporting wins more than $1000
A	223	-$38.21	-$36.73	-$33.73	-$41.22	-$49.53	-$20.00	-$20.00	13.5%	3.6%	0%	0%
B	207	-$17.14	-$30.66	-$32.25	-$43.90	-$54.38	-$20.00	-$10.00	11.2%	4.3%	0%	1.0%
C	193	-$32.22	-$58.40	-$53.07	-$55.94	-$73.26	-$22.00	-$10.00	5.7%	5.7%	0.5%	1.0%
D	188	-$763.58	-$376.92	-$283.20	N/A[1]	-$858.42	-$49.85	-$20.00	0%	7.4%	6.4%	1.1%
E	197	-$28.71	-$25.66	-$23.08	-$37.37	-$57.67	-$10.00	0	27.4%	8.1%	0.5%	0%
F	188	-$87.35	-$20.32	-$18.60	-$14.05	-$157.89	-$10.00	0	26.6%	8.5%	1.1%	0.5%
G	219	-$24.20	-$30.22	-$24.73	-$28.86	-$89.51	-$10.00	0	15.5%	18.7%	1.4%	0.5%
H	217	-$1047.67	+$88.68	+$52.79	N/A[1]	-$2234.35	-$14.25	0	15.6%	17.6%	4.1%	3.7%
I	202	+$2.10	-$20.92	-$21.30	-$29.99	-$36.85	-$13.00	-$10.00	12.4%	9.9%	0%	0.5%
J	203	-$25.04	-$15.19	-$18.50	-$25.32	-$67.22	-$18.00	-$20.00	14.3%	8.9%	0.5%	0.5%
K.	194	+$430.48	-$42.02	-$43.60	-$42.44	-$65.36	-$24.00	-$10.00	8.7%	8.8%	0%	1.0%
L	193	-$1519.35	-$462.60	-$217.92	N/A[1]	-$1930.48	-$28.60	-$40.00	0%	15.5%	3.6%	1.6%
All Questions Combined	2424	-$255.03	-$45.93	-$42.62	N/A	-$471.45	-$20.00	0	11.8%	10.7%	1.5%	0.9%

1. The reliability question was not asked for people who received question D, H, and L as it was too complicated an algorithm.

Note: Bolded boxes indicate sums that are within 33% of the 'true value' (see section on *Which Question Wording Produces the Most Valid Estimate?*)

Previous research suggests that retrospective estimates of gambling expenditure have poor reliability and are very much influenced by social desirability bias and question wording. The present results strongly support this. First, only 37.3% of individuals 'passed' the reliability question, that is, endorsed that their yearly spending was at least 2/3rds of what they had reported it to be five minutes earlier. Much of this is probably due to the earlier question typically asking about monthly or last time expenditure on each form of gambling rather than an aggregate yearly amount. Nonetheless, it seems clear that most people either do not keep track of gambling expenditure, have a difficult time in quickly tabulating it, or else consider this such sensitive information that they distort the true figures.

Further evidence of the unreliability of retrospective estimates and the importance of question wording is the fact that expenditure estimates were considerably different for some question wordings compared to others. As seen in Table 6, asking people how much they 'came out ahead or behind' on gambling in the past month consistently produces the lowest median estimates (-$11.06). These amounts are much lower than obtained when asking people how much they 'spend' gambling (-$27.96). Asking people how much they 'spend' and then explaining that this means how much they 'come out ahead or behind', produces an intermediate amount (-$20.91).

Asking people how much they spend on 'gambling' (-$14.33) produces slightly lower amounts compared to asking how much they spend 'in total on lottery, raffle and instant win tickets, Sports Select, slot machines and table games at Ontario casinos and racetracks, horse race betting, and bingo' (-$16.00). Somewhat higher amounts are obtained when people are asked how much they spend on each specific type of gambling in the past month and adding the totals (-$18.67).

Finally, the highest amounts are obtained when asking people how much they spent on each specific activity 'the last time they purchased/played that activity' and then asking 'how often they purchase/play' that activity to derive a monthly estimate (-$30.90). As can be seen, this type of question evokes significantly more totals >$1000 than other types of questions.

Table 6. Rank Order of Question Wordings Producing the Lowest Median Monthly Expenditure Estimate to the Highest.

E	-$10.00	Roughly how much money do you come out ahead or behind on gambling in a typical month?
G	-$10.00	Roughly how much money do you come out ahead or behind on [specific gambling activity] in a typical month?
F	-$10.00	Roughly how much money do you come out ahead or behind in total on lottery, raffle and instant win tickets; Sports Select; slot machines and table games at Ontario casinos and racetracks; horse race betting; and bingo in a typical month?
I	-$13.00	Roughly how much money do you spend on gambling in a typical month? What we mean here is how much you are ahead or behind, or your net win or loss in a typical month.
H	-$14.25	Roughly how much money did you come out ahead or behind on [specific gambling activity] the last time you purchased/played [specific gambling activity]? Roughly how often do you purchase/play [specific gambling activity]. Would you say daily, 4-6 times a week, 1-3 times a month, 4-12 times a year, 1-3 times a year, or less than once a year?
J	-$18.00	Roughly how much money do you spend in total on lottery, raffle and instant win tickets; Sports Select; slot machines and table games at Ontario casinos and racetracks; horse race betting; and bingo in a typical month? What we mean here is how much you are ahead or behind, or your net win or loss in a typical month.
A	-$20.00	Roughly how much money do you spend on gambling in a typical month?
B	-$20.00	Roughly how much money do you spend in total on lottery, raffle and instant win tickets; Sports Select; slot machines and table games at Ontario casinos and racetracks; horse race betting; and bingo in a typical month?
C	-$22.00	Roughly how much money do you spend on [specific gambling activity] in a typical month?
K	-$24.00	Roughly how much money do you spend on [specific gambling activity] in a typical month? What we mean here is how much you are ahead or behind, or your net win or loss in a typical month.
L	-$28.60	Roughly how much money did you spend on [specific gambling activity] the last time you purchased/played [specific gambling activity]? What we mean here is how much you are ahead or behind, or your net win or loss on that occasion. Roughly how often do you purchase/play [specific gambling activity]. Would you say daily, 4-6 times a week, 1-3 times a month, 4-12 times a year, 1-3 times a year, or less than once a year?
D	-$49.85	Roughly how much money did you spend on [specific gambling activity] the last time you purchased/played [specific gambling activity]? Roughly how often do you purchase/play [specific gambling activity]. Would you say daily, 4-6 times a week, 1-3 times a month, 4-12 times a year, 1-3 times a year, or less than once a year?

These results help explain findings from other jurisdictions where reported expenditures were significantly below actual revenues in some cases and significantly higher than actual revenues in other cases. Table 7 lists these studies rank ordered by their ratio of reported expenditures to actual revenues. As can be seen, studies that have asked about 'win/loss' have consistently produced the lowest ratios. Studies that have asked about 'spending' on each type of gambling and then added the totals have produced the highest reported expenditures relative to actual revenues.

Table 7. Reported Gambling Expenditures versus Actual Gaming Revenues in Different Studies.

Jurisdiction	Expenditure Question(s)	Ratio of Reported Expenditures to Actual Gaming Revenues [1]
United States (Gerstein et al. 1999)	1. Did you come out ahead or behind on your [gambling activity] in the past year → then asked how much 2. On the last day you gambled at [gambling activity] did you come out ahead or behind (choices being ahead, behind, broke even) → then asked how much	• 0.0 casinos (reported winning $3 billion) • 0.0 racetrack (reported winning $2 billion) • 0.0 private gaming (reported winning $4 billion) • 0.9 lotteries • Last day sums 3-4 times higher than past year sums.
Ontario (Wiebe et al., 2001)	1. In the past 12 months how often did you bet or spend money on [gambling activity] (daily, at least 1/wk; at least 1/mo; < 1/mo)? 2. On a typical occasion when you spend money on [gambling activity], how much money do you spend, not including winnings? 3. On a typical occasion when you spend money on [gambling activity], how much money do you win? 4. On a typical occasion when you spend money on [gambling activity], how much money do you lose?	• win-loss method resulted in reported net winnings for sports with bookie and card/board games with friends; no losses for casino table games; losses for everything else • "spent" resulted in much higher reported losses than (win – loss) with the exception of lottery tickets, which were the same
Australia (Productivity Commission, 1999)	1. In the past 12 months how many times per week or per month or per year have you played [gambling activity]? 2. How much money do you usually take with you (VLT, horses) or how much money do you usually outlay each time you buy (scratchies, lotteries)? 3. How much money do you usually have left when you leave?	• < 1.0 on wagering (sports; horses) and gaming machines • 1.4 lotteries
New Brunswick (N.B. Health, 2002) [2]	1. On average, approximately how many times per week, per month, or in the last year did you play/purchase [gambling activity]? 2. On average, how much did you spend, out of pocket (i.e., excluding any winnings) each time you played [gambling activity]?	0.8 (.6)
British Columbia (Ipsos Reid, 2003)	About how much do you spend on gambling in an average month?	1.1 (.7)
New Zealand (Abbott & Volberg, 2000)	What amount of money do you spend on [gambling activity] in a typical month?	1.1 overall • casino & gaming machines much lower than actual; lotteries & raffles higher than actual
Manitoba (AFM, 2002)	How much money, not including winnings, did you spend on [gambling activity] in a typical month?	(1.2)

Alberta (Smith & Wynne, 2002)	In the past 12 months, how much money, not including winnings, did you spend on [gambling activity] in a typical month?	1.7 (1.1)
Saskatchewan (Wynne, 2002)	How much money, not including winnings, did you spend on [gambling activity] in a typical month?	1.7 (1.3)
Iowa, Mississippi, New York; Louisiana; Montana & Washington (Volberg, et al., 2001)	How much do you spend on [gambling activity] in a typical month?	3.9 bingo 3.9 casino table 2.5 pari-mutuel 1.9 lottery 0.6 gaming machines
Nova Scotia (Baseline Marketing, 1996) [2]	Can you give me an idea of the amount that you spend on [gambling activity] in a typical month?	4.1 (3.5)
P.E.I. (Dorion & Nicki, 1999) [2]	Approximately how much money do you spend on [gambling activity] in a typical month?	4.2 (2.9)

1. Numbers in brackets are the ratios calculated from revenues <u>before</u> prizes are paid out for lottery and charity gaming.
2. Small sample size (n = 800).

Which Question Wording Produces the most Valid Retrospective Estimate?
<u>Inter-jurisdictional Comparisons of Expenditure to Revenue</u>

The degree to which reported expenditures match up with actual revenue is one way of establishing the validity of question wording. The inter-jurisdictional comparisons in Table 7 indicate that questions asking about win/loss produce expenditure estimates that are much too low. The studies with the closest ratios have either asked "About how much do you spend on gambling in an average month" (equivalent to **Question A**) or "What amount of money do you spend on [gambling activity] in a typical month?" (equivalent to **Question C**). However, this latter question has also produced some estimates that are too high. Williams & Wood (2004a) have argued that people are most likely reporting outlay rather than net win/loss when asked about monthly spending on types of gambling where the outcome is not immediately determined (i.e., lotteries, raffle tickets, bingo, sports betting). The ratio of reported expenditure to actual revenue (in the studies with ratios that are too high) are much closer when revenue figures for lottery and charity gaming <u>before prizes</u> are used.

<u>Expenditure to Revenue Comparisons in the Present Study</u>

As reported earlier, total gambling expenditures by Ontario residents in 2003 is estimated to be $4,037,603,000. As there are approximately 9,441,668 adults (18+) in Ontario in 2003, the average yearly expenditure should be -$427.64 and the average reported monthly expenditure should be -$35.64. In the present study, 59.9% of people did not receive the full survey (including the expenditure question) because they indicated they spent less than $9 in a typical month on gambling in the past year. The average monthly expenditure of this 59.9% of the sample is -$1.71. Thus, for the total sample average to be -$35.64, the average monthly expenditure of the remaining 40.1% should be -$86.29.

Before considering which question average comes closest, it is important to determine the best way of calculating the averages. There are two problems to consider. First, because the sample sizes for each question are small, large wins or losses are likely to have a disproportionate

impact on the overall average. To offset this, winsorized and trimmed averages were also calculated. The second consideration concerns whether more valid estimates can be achieved either by eliminating people who are not consistent in their estimate of expenditure and/or report typically winning money or breaking even.

The evidence is contained in Table 5:

- As expected, very few of the unadjusted averages come close to the true figure of -$86.29. A few large wins and losses have resulted in many of the averages being considerably higher or lower than they should be. Only **Question F** has an unadjusted average that is close (-$87.35). However, this may be coincidental, as there was one individual reporting a $10,000 loss in a typical month. When this person is eliminated the average falls to -$34.24. There is good reason to suspect this $10,000 monthly estimate is not valid, as this person failed to endorse that his yearly spending was at least $80,000 in the reliability question.
- The winsorized and trimmed averages decrease the impact of outliers and improve these figures somewhat. However, only **Question C** has an average that approximates the true figure.
- Unfortunately, there was a positive correlation between the size of a person's expenditure estimate and the likelihood of the estimate being unreliable. As a consequence, eliminating unreliable estimates had the effect of producing averages that were consistently lower than the 'true' figure. (This indicates that not only are larger estimates of expenditures more likely to be exaggerated, but that true large losses appear to be more difficult for people to accurately tabulate or remember).
- The type of average that seems to produce the best estimates are averages when eliminating people reporting that they typically win or break even. In this column, **Questions C, G, J, and K** have averages close to the true figure.

There are also ways of establishing the relative validity of each question in addition to how well the average matches up with the true expenditure:

- Questions D, H, and L all have averages that are far too large relative to actual revenues. (All three of these questions ask about expenditure the last time the person played and then multiply this amount by frequency of play). These overestimates are unlikely to change with a larger sample size because these questions consistently evoke a significant percentage of people to report large losses or wins (see last two columns in Table 5).
- Questions E, F, G, I, J, K all produce a significant percentage of people reporting 'winning' or 'or breaking even' in a typical month. (All six of these questions ask how much the person is 'ahead or behind'). Winning or breaking even is implausible for regular gamblers, as the activities contributing to these totals all have negative expected returns (forms of gambling not contributing to Ontario revenues were not included, e.g., stock market, betting with friends). Furthermore, all of these people previously reported that they spent at least $9 in a typical month gambling in order to be administered the full survey.
- That leaves **Questions A, B, C** as the best options, with Question C perhaps being the best of the three on the basis of these attributes.

Comparison with Figures from the Prospective Diary

Comparison with figures from the Prospective Diary is a third method for establishing the relative validity of the retrospective estimates (assuming the prospective diary gives more accurate accounting). A total of 364 people who gave a retrospective estimate on the telephone

subsequently completed a 4 week prospective diary of their expenditures. Table 8 reports their retrospective estimates, their expenditure from their 4 week prospective diaries, and the Pearson correlations between the retrospective estimates and the diary amounts. In general, there was poor consistency between retrospective estimates and actual figures obtained from prospective diaries. The greatest consistency occurred with the retrospective estimates obtained for people administered **Question C**.

Table 8. Retrospective Estimates of Expenditure Compared to the Prospective Diary Amounts as a Function of Retrospective Question.

Question	n	Retrospective Average	Prospective Average	Pearson Correlation	Pearson Correlation (winsorized data)
C	27	-$65.76	-$118.64	.72	.52
K	37	-$75.11	-$121.04	.40	.45
J	30	-$35.57	-$128.88	.39	.34
L	33	-$9272.01	-$91.80	.27	.61
F	28	-$374.07	-$31.76	.24	.41
E	22	-$33.14	-$33.24	.23	-.03
D	31	-$418.22	-$347.92	.02	.12
H	36	+$463.93	+$656.00	0	.30
B	25	-$23.40	-$71.48	-.11	-.18
G	30	-$8.77	-$133.12	-.17	.03
I	36	-$34.67	+$67.68	-.17	-.24
A	29	-$76.00	+$31.32	-.51	-.04

Table 9 reports Pearson correlations between retrospective estimates and prospective amounts as a function of gambling category. As can be seen, retrospective estimates are very poor predictors of amounts obtained by means of prospective diaries. Furthermore, this lack of consistency is true for all categories of gamblers.

Table 9. Correlations between Retrospective Estimates of Expenditure and Prospective Diary Amounts as a Function of Gambling Category.

	Unadjusted Data	Winsorized Data
NonProblem Gamblers	-.05	-.22
Low Risk Gamblers	.26	.29
Moderate Problem Gamblers	.18	.19
Severe Problem Gamblers	.09	.05

How well do Reported Retrospective Expenditures on Specific Forms of Gambling Match up to Actual Revenues for that Form?

Table 10 reports these ratios using the reported expenditures from Question C. These figures must be seen as very tentative, however, as the validity of Question C responses has not been clearly established and the sample size is very small (n = 193). Similar to other studies, reported gaming machine expenditures are significantly below what they should be. Unlike other studies, lotteries expenditures are not higher than actual revenues. This potentially could be because satellite bingo revenue is lumped together with lottery product revenue but reported expenditure on satellite bingo was not assessed separate from bingo.

Table 10. Ratio of Reported Expenditures to Actual Revenues for Retrospective Question C.

Gaming Type	Ratio of Expenditures to Revenue (only people reporting losses)
Gaming Machines	.49
Casino Table Games	2.27
Lottery Products & Satellite Bingo	.77
Bingo, Raffles, Break-Open Tickets	1.53
Horse Racing	.74
TOTAL	.85

Estimates of Gambling Expenditure from the Prospective Diary

Response Rates

        Eight hundred and eleven people were asked if they would be willing to complete the 1-month diary of gambling expenditures. Five hundred and twenty (64.1%) people agreed to do so. A total of 344 people returned four weeks of completed diaries and another 20 returned between one and three weeks of completed diaries. This return rate represents 70.0% (364/520) of people who agreed to complete the diary and 44.9% (364/811) of people who were asked if they would be willing to do so. The overall response rate as a function of gambling status is reported below in Table 11:

Table 11. Prospective Diary Response Rates as a Function of Gambling Status.

	Number Asked	Number Agreeing	Number returning diaries	Response Rate
Nonproblem Gambler	331	210	156	47.2%
Low Risk Gambler	239	157	116	48.5%
Moderate Problem Gambler	175	110	60	34.3%
Severe Problem Gambler	66	43	32	48.5%
TOTAL	811	520	364	44.9%

        An investigation was made to see whether there were any significant differences in the characteristics of the people who provided prospective diaries and people who did not. Variables tested were: age, gender, household income, retrospective expenditure estimate, and CPGI scores. These comparisons were made for each of the four categories of gamblers. As seen in Table 12, there were no significant differences in these characteristics for any of the four CPGI categories of gamblers.

Table 12. Comparison of Diary Participants and Diary Nonparticipants (unweighted values)

	Nonproblem Participants	Nonproblem Nonparticipants	Significance
age	45	48	$t = .03$, NS
gender	47.9% male	52.4% male	$\chi^2 = .65$, NS
household income	$79,170	$59,690	$t = .04$, NS
median retrospective expenditure estimate	-$15	-$11	$z = -1.2$, NS
average retrospective expenditure estimate	+$254	+$40	$t = .43$, NS
CPGI score	0	0	N/A
	Low Risk Participants	Low Risk Nonparticipants	Significance
age	43	42	$t = -.72$, NS
gender	48.6% male	50.8% male	$\chi^2 = .11$, NS
household income	$61,040	$67,180	$t = -.47$, NS
median retrospective expenditure estimate	-$20	-$20	$z = -.68$, NS
average retrospective expenditure estimate	-$2048	+$74	$t = -.25$, NS
CPGI score	1.3	1.3	$t = .29$, NS
	Moderate Problem Participants	Moderate Problem Nonparticipants	Significance
age	47	43	$t = -.10$, NS
gender	25/55 male	66/120 male	$\chi^2 = 1.37$, NS
household income	$54,061	$62,570	$t = -.25$, NS
median retrospective expenditure estimate	-$45	-$63	$z = -.75$, NS
average retrospective expenditure estimate	-$158	-$1034	$t = .33$, NS
CPGI score	4.4	4.6	$t = -.45$, NS
	Severe Problem Participants	Severe Problem Nonparticipants	Significance
age	41	44	$t = .41$, NS
gender	50% male	57% male	$\chi^2 = .28$, NS
household income	$46,330	$67,690	$t = -.46$, NS
median retrospective expenditure estimate	-$170	-$206	$z = -.33$, NS
average retrospective expenditure estimate	-$1610	-$9571	$t = .44$, NS
CPGI score	11.3	12.1	$t = -.53$, NS

Net Monthly Expenditure for People Completing the Prospective Diaries

Table 13 reports the mean, median and modal expenditures as reported by people in their prospective diaries organized by gambling category. For comparison purposes, the retrospective estimates of gambling expenditures reported by these individuals in the telephone survey are also reported below. Because the sample sizes are relatively small, the averages are significantly impacted by a few individuals reporting very large losses or wins. Thus, average expenditures are also calculated when:

a. Winsorizing the top and bottom 1% of the data within each category of gambler (i.e., replacing the values with the next highest or lowest value plus one) (miminum of 1 data point winsorized at each end).

b. Trimming (deleting) the top and bottom 1% of the data within each category of gambler (minimum of 1 data point deleted at each end).

Also, in an attempt to improve the reliability and validity of the data, average expenditures are also calculated when:

a. Eliminating people whose report of their total household income and total household debt in the prospective diary was not within 33% of what they reported during the telephone survey.

b. Eliminating anyone who reported winning money or breaking even.

Table 13. Four Week Expenditures from the Prospective Diaries (as well as their Retrospective Estimates from the Telephone Survey).

Prospective Diary Expenditures	N	Average	Average (top & bottom 1% winsorized within category)	Average (top & bottom 1% trimmed within category)	Average (unreliable removed)[1]	Average (only people reporting losses)	Median	Mode	% break even or no spending	% winners	Average Time Spent per Week[3]
NonProblem Gamblers	156	+$13.00	-$19.44	-$16.52	+$36.56	-$63.44	-$18.52	0	8.1%	12.8%	1.0 hrs
Low Risk Gamblers	116	-$91.48	-$96.00	-$89.68	-$85.88	-$127.28	-$27.00	-$24.00	1.7%	15.8%	1.2 hrs
Moderate Problem Gamblers	60	-$101.44	-$76.60	-$76.08	-$126.12	-$239.00	-$71.00	-$21.00	0%	16.9%	3.6 hrs
Severe Problem Gamblers	32	+$573.60	-$453.68	-$330.96	+$896.72	-$743.40	-$247.52	none	0%	18.2%	6.9 hrs
Retrospective Estimates from Telephone Survey	N	Average	Average (top & bottom 1% winsorized within category)	Average (top & bottom 1% trimmed within category)	Average (unreliable & winners removed)[2]	Average (only people reporting losses)	Median	Mode	% break even or no spending	% winners	Average Time Spent per Week
NonProblem Gamblers	156	+$240.45	-$23.51	-$26.30	-$43.59	-$50.64	-$12	-$10	12.8%	8.6%	N/A
Low Risk Gamblers	116	-$1832.37	-$49.35	-$44.56	-$40.00	-$2686.71	-$15	0	12.7%	11.8%	N/A
Moderate Problem Gamblers	60	-$139.83	-$114.07	-$104.02	-$123.53	-$218.00	-$45	-$100	10.9%	12.7%	N/A
Severe Problem Gamblers	32	-$1610.08	-$1163.88	-$785.27	-$201.67	-$1989.19	-$170	-$200	9%	9%	N/A

1. Eliminating people whose report of total household income and total household debt in the prospective diary was not within 33% of what they reported during the telephone survey (occurring for 18% of severe problem gamblers; 25% of moderate problem gamblers; 25% of low risk gamblers; 19% of nonproblem gamblers).
2. Eliminating people who failed to indicate their yearly expenditure was at least 2/3rds of what they had reported earlier and/or reported winning money.
3. Number of days gambled in the past 28 was 14.4 (severe problem gambler); 9.7 (low risk gambler); 13.1 (moderate problem gambler); 7.6 (nonproblem gambler).

Validity of Prospective Diary Expenditures

The prospective diary average expenditures suffer from the same problem as the retrospective estimates, which is that a few people with very high or low expenditures have a disproportionate impact on the group means. If the averages are taken at face value then both nonproblem gamblers and severe problem gamblers have, on average, *won* money in the four weeks they recorded their gambling expenditures. It is tempting to discount this data as invalid and unreliable, similar to many of the retrospective estimates. This is probably too hasty a conclusion. First, it is quite likely that a few regular gamblers will have quite large wins in any four week period (wins are much less plausible for the retrospective estimates where people are usually asked about 'typical' monthly win/loss). Secondly, there is substantial support from other areas that prospective diaries provide the most valid reports of sensitive behaviour because of less memory demands and the self-administered format enhancing anonymity. Evidence is this is typically seen in the increased frequency of the behaviours reported and better matching with objective data. Indeed, in the present study the median expenditures for all four categories of gamblers are significantly higher for the prospective diaries compared to the retrospective estimates. An additional benefit of the prospective diaries in the present study was the ability to clearly explain in the diary instructions (by examples) what was meant by 'spending money on gambling'. Previous research (e.g., Blaszcynski et al., 1997) has shown this to be a common area of confusion.

The winsorized and trimmed averages provide figures that appear more appropriate. All values are negative and there is generally an increase in expenditure from nonproblem gambler to severe problem gambler.

The prospective diary reliability question had the same problem as the retrospective reliability question. Namely, that people who were unreliable (and eliminated) tended to report larger losses than other people. Unfortunately, some of these losses appear to be valid losses, as without these individuals, both nonproblem and severe problem gamblers have, on average, won money.

As was the case with the retrospective estimates, the figures for only people reporting losses appear the most appropriate of all, with all values negative and a strong linear increase in expenditure from nonproblem to problem gamblers.

Of course, validity can again be examined by seeing how well these reported expenditures match up with actual revenue. Table 14 below presents the projected expenditure and ratio of expenditure to actual revenue using the winsorized, trimmed, and losses-only data. As can be seen, the total winsorized and trimmed expenditures are 37-46% below actual revenues, and the losses-only total is 37% higher than actual revenues. This makes sense considering that the largest expenditures have been winsorized or eliminated in the former and all wins have been eliminated in the latter. All in all, these ratios provide reasonable support for the contention that the prospective diary data is an accurate reflection of true expenditures (especially in light of some of the previous mentioned uncertainties involved in tabulating revenues).

Of final note, further corroboration of the validity of these reported expenditures is seen in the average amount of *time* gambling each category of gambler reports spending every week in Table 13 (time spent is perhaps less sensitive information compared to money spent). There appears to be a very close correspondence between time spent and money spent. Although not done in the present study, expenditures could also be determined simply on the basis of time spent

on each form of gambling multiplied by the expected loss per hour on that form. It is clear that problem gamblers will again account for a substantial portion of the total revenue based on their average of 5.3 hrs/week spent compared to < 1.1 hrs/week by the low risk and nonproblem gamblers.

Table 14. Projected Yearly Expenditures from the Prospective Diaries.

Category	%	Number in the General Ontario Adult Population	Total Yearly Expenditure (top & bottom 1% winsorized within category)	Total Yearly Expenditure (top & bottom 1% trimmed within category)	Total Yearly Expenditure (only people reporting losses)
Nongamblers (people reporting spending $0 in typical month)	40.87%	3,858,810	0	0	0
Nonproblem Gamblers spending $1-$8 in a typical month	17.99%	1,698,556	-$83,772,782	-$83,772,782	-$83,772,782
Nonproblem Gamblers spending >$9/mo and CPGI 0	28.87%	2,725,810	-$688,866,703	-$585,394,956	-$2,248,030,023
Low Risk Gamblers CPGI 1-2	7.51%	709,069	-$884,918,112	-$826,661,003	-$1,183,253,930
Moderate Problem Gamblers CPGI 3-7	3.76%	355,007	-$353,515,971	-$351,116,123	-$1,103,006,749
Severe Problem Gamblers CPGI 8+	1.00%	94,417	-$556,856,359	-$406,227,254	-$912,464,771
Total	100%	9,441,668	-$2,527,929,927	-$2,253,172,118	-$5,530,528,255
Ontario Revenues			-$4,037,603,000	-$4,037,603,000	-$4,037,603,000
Ratio of Expenditure to Actual Revenue			.63	.56	1.37

Table 15 reports the ratio of expenditures to revenue for each form of gambling. As was the case with the retrospective questions, reported expenditures for gaming machines and horse racing are somewhat below what they should be, and reported expenditures for lottery products, bingo, raffles and break-open tickets are higher than they should be. Here again, there is a close enough match for the majority of these figures to have some confidence in their validity.

Table 15. Ratio of Reported Expenditures in the Prospective Diaries to Actual Revenues for each form of Gambling.

	Ratio of Expenditures to Revenue (only people reporting losses)
Gaming Machines	.75
Casino Table Games	1.33
Lottery Products & Satellite Bingo	2.07
Bingo, Raffles, Break-Open Tickets	1.77
Horse Racing	.90

Proportion of Ontario Gaming Revenue Derived from Problem Gamblers

On the basis of the contention that reported expenditures are an accurate reflection of true expenditures, then Table 16 reports the proportion of revenue derived from the moderate and severe problem gamblers. Both the winsorized and losses-only data suggest that this proportion is approximately 36%. The trimmed data suggests it to be about 34%.

Table 16. Proportion of Revenue Derived from Problem Gamblers.

	Winsorized Data	Trimmed Data	Losses-Only Data
% Expenditure from Moderate Problem Gamblers	14.0%	15.6%	19.9%
% Expenditure from Severe Problem Gamblers	22.0%	18.0%	16.5%
% Expenditure from all Problem Gamblers	36.0%	33.6%	36.4%

Table 17 reports the proportion of revenue derived from problem gamblers as a function of type of gambling. This evidence indicates that gaming machines and horse racing contribute a much larger portion of their revenue from problem gamblers in comparison to other forms of gambling such as lottery products, bingo, raffle tickets, and break-open tickets. In rank order, the rough proportions are: 60% gaming machines; 53% horse racing; 22% casino table games; 22% bingo and raffles; and 19% lotteries, instant win, and Sports Select.

Table 17. Proportion of Revenue Derived from Problem Gamblers as a Function of Type of Gambling

	Winsorized Data	Trimmed Data	Only people reporting losses
Gaming Machines	62%	58%	61%
Lottery, Instant Win Tickets, & Sports Select	19%	20%	17%
Casino Table Games	30%	0%	35%
Bingo and Raffles	17%	22%	28%
Horse Racing	38%	69%	52%

DISCUSSION

Summary of Findings

The main findings of this study can be summarized as follows:

1. Based on a sample of 6,654 adults (18+), the past year prevalence of moderate and severe problem gambling in Ontario in 2003 was found to be 4.8% (3.8% moderate; 1.0% severe). This is higher than the 3.8% obtained by Wiebe et al. in 2001 and the 2.0% obtained by the Canadian Community Household Survey (CCHS 1.2) in 2002. The lower rates in the latter studies are likely attributable to lower response rates in the Wiebe et al. study and the face-to-face format used in the CCHS study.

2. Similar to other research, problem gamblers are more likely to be male, of Aboriginal descent, single or divorced, with lower family income, and less education.

3. Adjusting for people not available for telephone sampling because of incarceration, residential treatment, or being a member of the Armed Forces has a negligible impact on the rates of problem gambling (.02% increase).

4. Contrary to expectation, problem gamblers who participated in the study were not more difficult to contact than nonproblem gamblers. Using exhaustive attempts over several months, the average number of attempts to establish contact for the entire sample was 5.2 compared to 5.7 for moderate and severe problem gamblers. Ninety-five percent of the total sample was contacted within 15 phone calls and 95% of both moderate and severe problem gamblers were contacted within 16 phone calls. Subsequent prevalence studies may wish to use these numbers to guide their RDD protocol.

5. In general, retrospective estimates of gambling expenditures are unreliable. First, only 37% of people endorsed that their yearly spending was at least two-thirds of what they had reported it to be five minutes earlier in the survey. Secondly, there is very little correlation between retrospective estimates of expenditures and subsequent amounts obtained by prospective diaries. Thirdly, very few retrospective estimates come close to matching actual revenues. It seems clear that most people either do not keep track of gambling expenditure, have a difficult time in quickly tabulating it, or else consider this such sensitive information that they distort the true figures.

6. Retrospective estimates of gambling expenditures are also strongly shaped by how the question is asked.
   - Questions that ask people how much they 'come out ahead or behind' on gambling produce much lower amounts than asking people how much they 'spend' on gambling. Asking people how much they 'spend' and then explaining that this means how much they 'come out ahead or behind', produces an intermediate amount.
   - Asking people how much they spend on 'gambling' produces slightly lower amounts compared to asking how much they spend 'in total on lottery, raffle and instant win tickets, Sports Select, slot machines and table games at Ontario casinos and racetracks, horse race betting, and bingo'. The highest amounts are obtained when people are asked how much they spend on each specific type of gambling and adding the totals.
   - Asking people how much they spent 'the last time they purchased/played that activity' and

then asking 'how often they purchase/play' that activity produces much higher amounts than questions that ask for an aggregate estimate about monthly spending.

7. Certain retrospective question wordings appear to be able to elicit estimates with better reliability and validity than others. The question wording that appears best is Question C: "Roughly how much money do you spend on [specific gambling activity] in a typical month?" (with totals from each activity then added together). This is actually the question wording most often used in previous research.

8. Prospective diaries appear to offer more valid estimates of gambling expenditures based on their overall match with actual revenues.

9. Expenditures from the prospective diaries tentatively indicates that about 35% of Ontario gaming revenue is derived from moderate and severe problem gamblers.

10. The prospective diaries indicate considerable variability in the proportion of revenue derived from problem gamblers as a function of gambling type. Up to 60% of revenue from gaming machines in Ontario may derive from problem gamblers. By comparison, lotteries, instant win tickets, bingo, and raffles may only derive 19% of their revenue from problem gamblers.

Limitations of these Findings

The findings concerning gambling expenditure are tentative for the following reasons:

1. Regular gamblers occasionally have very large wins and losses. These statistical outliers have a major influence on the averages, making it very difficult with small sample sizes to establish what the 'true' average expenditures are, so as to compare them with actual revenues. Realistically, there would have to be thousands of people administered each retrospective question version and thousands of people completing prospective diaries from each of the four categories of gamblers to offset the impact of these outliers. The present study compensated for this by using winsorized data, trimmed data, and data sets that eliminated winners. This is a reasonable but not perfect solution to this problem.

2. The proportion of revenue from *severe* problem gamblers is very tentative because of the small number of severe problem gamblers completing prospective diaries (n = 32). There is more certainty in the proportion derived from moderate and severe problem gamblers combined (n = 92). Similarly, the proportion of revenue derived from problem gamblers for particular forms of gambling is also tenuous. Because not all problem gamblers participate in all forms of gambling some of these estimates are based on small sample sizes. It seems certain that gaming machines derive more revenue from problem gamblers then other forms of gambling. However, the actual portion for each form of gambling is much less certain.

3. There is not a perfect match between reported expenditure and revenue for either retrospective Question C or the prospective diaries. For the prospective diaries, the total winsorized and trimmed expenditures are 37-46% below actual revenues, and the losses-only total is 37% higher than actual revenues. This makes some sense considering that the largest expenditures have been winsorized or eliminated in the former and all wins have been eliminated in the latter. It should also be noted that expenditure for lottery products is double what it should be and 77% higher than it should be for bingo, break-open tickets, and raffles. On the other hand, it is also important to realize that the present study found gambling

expenditure exaggeration and minimization to be equally common for all four types of gamblers, as evidenced by the uniformly low correlations between retrospective estimates and subsequent prospective diary amounts. The implication here is that if there is an over or underestimate of expenditures relative to revenues, it probably does not affect the proportion derived from problem gamblers because of equivalent exaggeration/minimization in each group.

Converging Lines of Evidence

The present study contributes to converging lines of evidence indicating that a substantial portion of gaming revenue derives from people who are negatively impacted by their involvement in this activity. There will never be an unambiguous determination of what that proportion is because of the lack of objective data on individual gambling expenditures. Some casinos keep detailed files (including expenditures) of 'high-rollers', but there is no tracking of regular players. Some larger casinos have 'player cards' that allow people to earn credits depending on how much and how often they bet. However, only some gamblers sign up for these cards. Video Lottery Terminals (not available in Ontario) keep a daily record of how much money they earn, but there is no record of how much each individual player spends, let alone what type of player it is (problem or nonproblem). Players who win money from a VLT receive a winnings slip that they redeem for cash, but players receive no printout of the losses they incur. Certain European casinos (e.g., Casino Holland) keep track of the number of visits each individual makes, but not their expenditures.

Thus, self-report remains the best method of investigating individual gambling expenditures. Using this method, there is now consistent evidence from several studies that the proportion of revenue derived from problem gamblers is very substantial. In the present study this proportion was estimated to be about 35%. If our observed average prevalence rate of 4.8% is indeed correct, then problem gamblers report a proportion of expenditure that is more than *seven times* their proportion among the Ontario population. A similar study using similar prospective diary methodology has just been completed for the province of Alberta, but the results have not yet been analyzed (Williams & Wood, 2004b). Using secondary prevalence data from 9 Canadian provinces, Williams & Wood (2004a) estimated that the average province derives 23% of its gaming revenue from problem gamblers (32% for Canada as a whole, with each province weighted by population). In a comparative study in three Canadian provinces and four American states, Lesieur (1998) found the contribution of problem gamblers to total gaming revenues to range from 23% to 41%, with an average of 30%. The U.S. national survey estimated that problem gamblers account for 15% of revenues (Gerstein et al., 1999). An Australian study of this issue estimated that problem gamblers account for about 33% of gambling revenues in that country (Productivity Commission, 1999). A New Zealand study estimated that problem/pathological gamblers were responsible for approximately 19% of gaming expenditure (Abbott & Volberg, 2000).

As noted in the beginning of this paper, many of these above studies are hampered by the fact that reported expenditures did not match up to actual revenues. However, the proportion of revenue from problem gamblers bears a strong linear relationship to the respective rates of

problem gambling in each of these countries, lending some support to the contention that these proportions are valid. Also, if all types of gamblers minimize and exaggerate to the same extent (as was found in the present study), then the proportion of revenue derived from problem gamblers would be the same, regardless of how well total expenditures match up to actual revenue.

The Exact Proportion Derived from Problem Gamblers Depends on the Circumstances

The proportion of revenue a jurisdiction derives from problem gamblers depends on several things. First it depends on the jurisdiction. Certain jurisdictions derive a considerable amount of their revenue from 'premium players' or 'whales'. In Las Vegas, high-rollers make up only 5% of customers, but generate 40% of the revenue (Walker & Miller, 2001). Some of these people may be problem gamblers, but many are not. Thus, jurisdictions that derive a good portion of their revenue from 'premium players' probably derive a comparatively smaller portion from problem gamblers. The proportion of revenue derived from problem gamblers will also depend very much on how widely available gambling is in the jurisdiction, what forms of gambling are available, what preventative and policy practises exist to minimize problem gambling, and the proportion of the populace that may be vulnerable to addictions.

Secondly, the proportion of revenue derived from problem gamblers will probably depend on the time period studied. Gambling availability and government policies can change fairly rapidly in any jurisdiction. Also, places that have had gambling available for a longer period of time may have different rates of problem gambling compared to places that have more recently introduced it.

Lastly, the proportion of revenue derived from problem gamblers depends on how you define and measure problem gambling. Gambling exists on a continuum, with three distinctions along that continuum typically being made. The first is 'social or recreational gambling,' such as the occasional game of bingo or cards. The second is 'problem gambling', or gambling that is associated with some significant adverse consequences for the individual or people in his/her immediate social network (Ferris, Wynne, & Single, 1999). The third type is 'severe problem gambling' (more commonly known as 'pathological gambling'), a more extreme form where the person not only experiences persistent and recurrent problems, but also shows signs of being preoccupied by gambling, dependent on it (e.g., withdrawal symptoms if not engaged in), and some inability to resist engaging in it (American Psychiatric Association (APA), 1994; Rosenthal, 1992). The present study has calculated the proportion of revenue derived from problem and pathological gamblers combined. However, other people might consider that the proportion derived from 'addicts' (i.e., pathological gamblers) is the more relevant figure.

Policy Implications

The detailed policy implications of this research are beyond the scope of this paper. Nonetheless, some points can be made to stimulate discussion.

An argument can be made that because Ontario appears to derive a substantial portion of its gaming revenue from problem gamblers that government-sponsored gambling is therefore

contrary to the interests of the general populace and contrary to the purpose of government. This may be true. However, an argument can also be made that the economic benefits of gaming in Ontario may offset the social and economic costs. There is usually a significant economic gain in jurisdictions such as Ontario that derive a good portion of their gaming revenue from tourists (Grinols, 2004). Not only is there an influx of out-of-jurisdiction wealth from tourists, but many of the social problems that are created go home with the tourists.

Both of these arguments need further elaboration. The one thing that is certain is that if government-sponsored gaming is to continue then there needs to be maximum effort to minimize its negative impact, including the disproportionate financial draw from problem gamblers. Ontario does much more in this regard than most jurisdictions. However, the present results indicate that considerably more needs to be done. In 2003/2004 the Ontario government spent $36 million dollars on problem gambling prevention, treatment and research. While substantial, this only represents 2.6% of the $1.41 billion dollars estimated to have derived from problem gamblers.

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APPENDIX A: ONTARIO TELEPHONE QUESTIONNAIRE

Hello, I'm conducting a short 5-10 minute survey about gambling for the Institute for Social Research at York University and the University of Lethbridge. Do you have a couple minutes?

Record gender _____

IF YES: That's great. Now when I talk about gambling I mean things such as buying lottery, raffle or instant win tickets; playing Sports Select; playing slot machines and table games at Ontario casinos and racetracks; horse race betting; and bingo. Can you tell me roughly how much you have spent on these activities in a typical month in the past year? _____ (If reluctant, ask whether it was at least $9) CONTINUE TO EXPENDITURE QUESTION IF $9 OR MORE; GO TO DEMOGRAPHICS SECTION IF LESS THAN $9

When asking questions about gambling, we find that people do not always like to admit that sometimes they lose but it will help our research if you can be as honest as possible when you answer our questions.

EXPENDITURE *(randomly asked one of the following 12 questions)*

a. Roughly how much money do you spend on gambling in a typical month? *(Note: if asked, 'spend' means how much R is ahead or behind, or their net win or loss).*

b. Roughly how much money do you spend in total on lottery, raffle and instant win tickets; Sports Select; slot machines and table games at Ontario casinos and racetracks; horse race betting; and bingo in a typical month? *(Note: if asked, 'spend' means how much R is ahead or behind, or their net win or loss).*

c. Roughly how much money do you spend on [specific gambling activity -> *see below*] in a typical month? *(Note: if asked, 'spend' means how much R is ahead or behind, or their net win or loss).*

d. Roughly how much money did you spend on [specific gambling activity -> *see below*] the last time you purchased/played [specific gambling activity]? Roughly how often do you purchase/play [specific gambling activity]. Would you say daily, 4-6 times a week, 1-3 times a month, 4-12 times a year, 1-3 times a year, or less than once a year? *(Note: if asked, 'spend' means how much R is ahead or behind, or their net win or loss).*

e. Roughly how much money do you come out ahead or behind on gambling in a typical month? *(Note: if their answer does not clearly indicate up/down, probe with 'so are you up or down').*

f. Roughly how much money do you come out ahead or behind in total on lottery, raffle and instant win tickets; Sports Select; slot machines and table games at Ontario casinos and racetracks; horse race betting; and bingo in a typical month?   *(Note: if their answer does not clearly indicate up/down, probe with 'so are you up or down').*

g. Roughly how much money do you come out ahead or behind on [specific gambling activity -> *see below*] in a typical month? (*Note: if their answer does not clearly indicate up/down, probe with 'so are you up or down').*

h. Roughly how much money did you come out ahead or behind on [specific gambling activity -> *see below*] the last time you purchased/played [specific gambling activity]?   Roughly how often do you purchase/play [specific gambling activity]. Would you say daily, 4-6 times a week, 1-3 times a month, 4-12 times a year, 1-3 times a year, or less than once a year? *(Note: if their answer does not clearly indicate up/down, probe with 'so are you up or down').*

i. Roughly how much money do you spend on gambling in a typical month? What we mean here is how much you are ahead or behind, or your net win or loss in a typical month.

j. Roughly how much money do you spend in total on lottery, raffle and instant win tickets; Sports Select; slot machines and table games at Ontario casinos and racetracks; horse race betting; and bingo in a typical month? What we mean here is how much you are ahead or behind, or your net win or loss in a typical month.

k. Roughly how much money do you spend on [specific gambling activity -> *see below*] in a typical month? What we mean here is how much you are ahead or behind, or your net win or loss in a typical month.

l. Roughly how much money did you spend on [specific gambling activity -> *see below*] the last time you purchased/played [specific gambling activity]? What we mean here is how much you are ahead or behind, or your net win or loss on that occasion. Roughly how often do you purchase/play [specific gambling activity]. Would you say daily, 4-6 times a week, 1-3 times a month, 4-12 times a year, 1-3 times a year, or less than once a year?

Specific gambling activities *(Random order except for last item)*
• lottery and instant win tickets
• Sports Select
• raffle or fundraising tickets
• slot machines at Ontario casinos and racetracks
• table games such as blackjack, roulette, craps, and poker at Ontario casinos
• horse race betting
• bingo
• Gambling on anything else, such as out-of-province casinos; betting on sports with a bookie; internet gambling; or betting against other people on games such as pool, darts, video games, board games, cards, etc.

CANADIAN PROBLEM GAMBLING INDEX *(not randomized; also, if people insist they do not have gambling problems twice they are not asked the rest of the questions)*

Thinking about the past 12 months, have you bet more than you could really afford to lose? Would you say:
a) never   b) sometimes   c) most of the time   d) almost always   e) don't know

Thinking about the past 12 months, have you felt guilty about the way you gamble or what happens when you gamble? Would you say:
a) never   b) sometimes   c) most of the time   d) almost always   e) don't know

In the past 12 months, have you needed to gamble with larger amounts of money to get the same feeling of excitement? Would you say:
a) never   b) sometimes   c) most of the time   d) almost always   e) don't know

In the past 12 months, when you gambled, did you go back another day to try to win back the money you lost? Would you say
a) never   b) sometimes   c) most of the time   d) almost always   e) don't know

In the past 12 months, have you borrowed money or sold anything to get money to gamble? Would you say

a) never   b) sometimes   c) most of the time   d) almost always   e) don't know

In the past 12 months, has your gambling caused any financial problems for you or your household? Would you say:
a) never   b) sometimes   c) most of the time   d) almost always   e) don't know

In the past 12 months, has your gambling caused you any health problems, including stress or anxiety? Would you say:
a) never   b) sometimes   c) most of the time   d) almost always   e) don't know

In the past 12 months, have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true? Would you say:
a) never   b) sometimes   c) most of the time   d) almost always   e) don't know

In the past 12 months, have you felt that you might have a problem with gambling? Would you say
a) never   b) sometimes   c) most of the time   d) almost always   e) don't know

RELIABILITY QUESTION (R gets asked the question in the same way they were asked the EXPENDITURE question)
In the past 12 months, was you total spending on gambling more than_____ ? (2/3rds of the figure derived from the EXPENDITURE question)   yes/no

In the past 12 months, was your total amount you were behind/ahead on gambling, or your net loss/win for the year more than_____ (2/3rds of the figure derived from the EXPENDITURE question)   yes/no

In the past 12 months, was your total spending on gambling, that is, the total amount you were behind/ahead, more than_____ (2/3rds of the figure derived from the EXPENDITURE question)   yes/no

Note: this question is not asked of people who reported breaking even, winning money or who were asked d, h, l (too complicated an algorithm)

DEMOGRAPHICS
In what year were you born?_____

What are the first 3 digits of your postal code? (If unknown: What town or city do you live in?)_____

At the present are you married, living with a partner, widowed, divorced, separated, or have you never been married?

Could you please tell me how much income you and other members of your household received in the year ending December 31st 2002, before taxes? To the nearest thousand dollars, what was your total household income before taxes and other deductions were made?_____

To what racial or ethnic group do you belong to? (if needed, "Is your ethnic or cultural background English, French, Polish, Chinese or something else?   In addition to being Canadian to what ethnic or cultural group did you, or your ancestors belong on first coming to this continent?)

What is the highest level of education you have completed?_____

AT THIS POINT, SCORE THE CPGI SCORING QUESTIONS, THEN CHECK DIARY QUOTAS (need 100 people in each of the 4 CPGI categories) , IF RESPONDENT QUALIFIES CONTINUE, IF INELIGIBLE END THE INTERVIEW BUT ASK FOR CALLBACK PRIVILEGES FOR FUTURE STUDIES.

To the nearest thousand dollars, what do you estimate your current total household DEBT to be. This would include mortgages, credit cards, loans, etc. _____

DIARY (n=400; stratified by CPGI level)
Thank you. Would you be interested in earning $50 to keep a daily record of your gambling for a month? What we would want is for you to spend a minute each day to record whether you gambled that day or not. If you had, to record the type of gambling, how long you spent, and how much you spent. At the end of the month you would send us that information and we would send you $50. All the information would be strictly confidential and all the individual records will be destroyed once the data has been combined to provide the overall results. Are you interested?

We would like to contact people again to talk over the phone for future studies. Would you be willing to be contacted? (only asked of problem gamblers)

APPENDIX B: ONTARIO PROSPECTIVE DIARY

Dear participant,

Thank you for participating in our study. We would like you to record the amount of time and money you spend on gambling on the back of the 4 sheets we have sent you. Do not alter any of your typical gambling activities for this study. It is quite acceptable (and expected) that some or even most days will not involve any gambling. Just leave these days blank.

Please begin recording your activities on the first Monday after receiving this. Record your gambling activities at the end of each day. You will start a new sheet on each Monday for 4 consecutive weeks. As soon as each sheet is complete, mail it to the Institute for Social Research at York University using the enclosed prepaid envelope. Upon receipt of the final sheet you will be sent a cheque for $50.00.

It is essential that you fill out these sheets honestly and accurately without any exaggeration or minimization. All the sheets will be stored in a locked filing cabinet with no person outside the research team having access to it. Furthermore, all individual records will be destroyed once the data from individual subjects is combined to provide the overall results.

You are free to withdraw from the study at any time. If you have any questions please feel free to contact either Dr. Wood or Dr. Williams at the University of Lethbridge, Alberta.

Sincerely,

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WEEK 1

Today's Date: _____(month)_____(day)_____ (year)

First Name_____ Last Name_____

Sex_____   Birth Date: _____ (month)_____(day)_____(year)

Mailing Address_____

_____

_____

TIME INSTRUCTIONS
• Under "TIME SPENT" indicate the total amount of time you spent doing this activity during the day. This includes the amount of time you spent preparing the wager (e.g., choosing your lottery numbers; picking the sports teams you are going to bet on; picking the stocks you are going to purchase, etc.) plus the amount of time you actually spent doing it (in the case of lottery tickets this may only take a few minutes).
• Indicate whether you are referring to MINUTES or HOURS

$$$$$ INSTRUCTIONS
• Under "$$$$$" indicate how much you are ahead or behind on the activity (your net loss/win) at the end of the day. For example, if you started with $30 and have $10 left you have a LOSS of $20, recorded as - $20.
• In cases where the outcome is not determined on the same day (e.g., lottery tickets, raffles, stock market), your net loss/win for the day is the amount you spent on the tickets or stocks (e.g., "- $50"). If you later win money from these tickets, etc., record the winnings on the day the winnings occurred (e.g., "+ $10"). In the case of stocks, options or futures that you purchased during the week but have not yet sold, simply record their value on the Sunday of that week.
• In cases where you immediately reinvest your winnings (e.g., bought more lottery tickets or put the money back into the slot machine), your net loss/win for the day is how much money you are ahead or behind from that activity at the end of the day.
• Only include money you spent on gambling. Do not include money you spent going to the casino, bingo hall, etc. or money you spent on food, drinks, etc.

	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$
LOTTERY TICKETS														
INSTANT-WIN TICKETS (scratch tickets, pull tabs/break-open tickets)														
RAFFLE OR FUNDRAISING TICKETS														
BINGO														
VLT or SLOT MACHINES (at Ontario casinos or racetracks)														
CASINO TABLE GAMES (at Ontario casinos: roulette, blackjack, craps, poker, sic bo, pai gow tiles, big six, etc.)														
HORSE RACE BETTING (at the track or off-track)														
SPORTS SELECT (Pro Line, Over/Under, Point Spread)														
SPORTS BETTING WITH A BOOKIE														
BETTING MONEY AGAINST FRIENDS, FAMILY OR OTHER PEOPLE (e.g, cards, board games, pool, darts, video games, sporting events, etc.)														
CASINOS OUTSIDE OF ONTARIO														
INTERNET GAMBLING														
STOCKS, OPTIONS, COMMODITY MARKETS OR FUTURES														

WEEK 2

Today's Date: _____(month)_____(day)_____ (year)

First Name_____ Last Name_____

Sex_____   Birth Date: _____ (month)_____(day)_____(year)

Mailing Address_____

_____

_____

TIME INSTRUCTIONS
• Under "TIME SPENT" indicate the total amount of time you spent doing this activity during the day. This includes the amount of time you spent preparing the wager (e.g., choosing your lottery numbers; picking the sports teams you are going to bet on; picking the stocks you are going to purchase, etc.) plus the amount of time you actually spent doing it (in the case of lottery tickets this may only take a few minutes).
• Indicate whether you are referring to MINUTES or HOURS

$$$$$ INSTRUCTIONS
• Under "$$$$$" indicate how much you are ahead or behind on the activity (your net loss/win) at the end of the day. For example, if you started with $30 and have $10 left you have a LOSS of $20, recorded as - $20.
• In cases where the outcome is not determined on the same day (e.g., lottery tickets, raffles, stock market), your net loss/win for the day is the amount you spent on the tickets or stocks (e.g., "- $50"). If you later win money from these tickets, etc., record the winnings on the day the winnings occurred (e.g., "+ $10"). In the case of stocks, options or futures that you purchased during the week but have not yet sold, simply record their value on the Sunday of that week.
• In cases where you immediately reinvest your winnings (e.g., bought more lottery tickets or put the money back into the slot machine), your net loss/win for the day is how much money you are ahead or behind from that activity at the end of the day.
• Only include money you spent on gambling. Do not include money you spent going to the casino, bingo hall, etc. or money you spent on food, drinks, etc.

	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$
LOTTERY TICKETS														
INSTANT-WIN TICKETS (scratch tickets, pull tabs/break-open tickets)														
RAFFLE OR FUNDRAISING TICKETS														
BINGO														
VLT or SLOT MACHINES (at Ontario casinos or racetracks)														
CASINO TABLE GAMES (at Ontario casinos: roulette, blackjack, craps, poker, sic bo, pai gow tiles, big six, etc.)														
HORSE RACE BETTING (at the track or off-track)														
SPORTS SELECT (Pro Line, Over/Under, Point Spread)														
SPORTS BETTING WITH A BOOKIE														
BETTING MONEY AGAINST FRIENDS, FAMILY OR OTHER PEOPLE (e.g, cards, board games, pool, darts, video games, sporting events, etc.)														
CASINOS OUTSIDE OF ONTARIO														
INTERNET GAMBLING														
STOCKS, OPTIONS, COMMODITY MARKETS OR FUTURES														

WEEK 3

Today's Date: _____(month)_____(day)_____ (year)

First Name_____ Last Name_____

Sex_____   Birth Date: _____ (month)_____(day)_____(year)

Mailing Address_____

_____

_____

TIME INSTRUCTIONS
- Under "TIME SPENT" indicate the total amount of time you spent doing this activity during the day. This includes the amount of time you spent preparing the wager (e.g., choosing your lottery numbers; picking the sports teams you are going to bet on; picking the stocks you are going to purchase, etc.) plus the amount of time you actually spent doing it (in the case of lottery tickets this may only take a few minutes).
- Indicate whether you are referring to MINUTES or HOURS

$$$$$ INSTRUCTIONS
- Under "$$$$$" indicate how much you are ahead or behind on the activity (your net loss/win) at the end of the day. For example, if you started with $30 and have $10 left you have a LOSS of $20, recorded as - $20.
- In cases where the outcome is not determined on the same day (e.g., lottery tickets, raffles, stock market), your net loss/win for the day is the amount you spent on the tickets or stocks (e.g., "- $50"). If you later win money from these tickets, etc., record the winnings on the day the winnings occurred (e.g., "+ $10"). In the case of stocks, options or futures that you purchased during the week but have not yet sold, simply record their value on the Sunday of that week.
- In cases where you immediately reinvest your winnings (e.g., bought more lottery tickets or put the money back into the slot machine), your net loss/win for the day is how much money you are ahead or behind from that activity at the end of the day.
- Only include money you spent on gambling. Do not include money you spent going to the casino, bingo hall, etc. or money you spent on food, drinks, etc.

	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$
LOTTERY TICKETS														
INSTANT-WIN TICKETS (scratch tickets, pull tabs/break-open tickets)														
RAFFLE OR FUNDRAISING TICKETS														
BINGO														
VLT or SLOT MACHINES (at Ontario casinos or racetracks)														
CASINO TABLE GAMES (at Ontario casinos: roulette, blackjack, craps, poker, sic bo, pai gow tiles, big six, etc.)														
HORSE RACE BETTING (at the track or off-track)														
SPORTS SELECT (Pro Line, Over/Under, Point Spread)														
SPORTS BETTING WITH A BOOKIE														
BETTING MONEY AGAINST FRIENDS, FAMILY OR OTHER PEOPLE (e.g, cards, board games, pool, darts, video games, sporting events, etc.)														
CASINOS OUTSIDE OF ONTARIO														
INTERNET GAMBLING														
STOCKS, OPTIONS, COMMODITY MARKETS OR FUTURES														

WEEK 4

Today's Date: _____(month)_____(day)_____ (year)

First Name_____ Last Name_____

Sex_____   Birth Date: _____ (month)_____(day)_____(year)

Mailing Address_____

_____

To the nearest thousand dollars, what was your total household income before taxes and other deductions were made in the year ending December 31st 2002?   This is total income from you and other members of your household, including income from savings, pensions, rent, unemployment insurance, etc. $_____

To the nearest thousand dollars, what do you estimate your current total household debt to be (include mortgages, credit cards, loans, etc.) $_____

Gambling refers to things such as buying lottery, raffle or instant win tickets; playing Sports Select; playing slot machines, VLTs and table games at casinos and racetracks; horse race betting; bingo; betting money against friends, family or other people, etc.. Has your involvement in any of these activities caused you or anyone else any problems in the past 12 months? By this we mean things such as mental stress or anxiety, money concerns, health problems, problems at school or work, legal problems, or arguments with friends or family?
a.   No
b.   Yes; IF YES -> Which types of problems have been caused?:
                    a.   mental stress or anxiety
                    b.   money concerns
                    c.   health problems
                    d.   problems at school or work
                    e.   legal problems
                    f.   problems with friends or family

                    Overall, how serious have these problems been?
                    a.   very serious
                    b.   serious
                    c.   not very serious?

                    How often has your gambling caused these problems in the past 12 months?
                    a.   Once
                    b.   2 or 3 times
                    c.   4 or 5 times
                    d.   more than 5 times

Are there other people who would say that your involvement in gambling has caused serious problems for you or other people in the past 12 months?
a.   No, no one would say that
b.   Yes, there are other people who would say that

How typical has your gambling been in the past 4 weeks?

	Much more than usual	More than usual	typical	Less than usual	Much less than usual
Frequency of gambling					
Time spent gambling					
Amount of money lost					
mount of money won					

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	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$	TIME SPENT	$$$$$
LOTTERY TICKETS														
INSTANT-WIN TICKETS (scratch tickets, pull tabs/break-open tickets)														
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CASINOS OUTSIDE OF ONTARIO														
INTERNET GAMBLING														
STOCKS, OPTIONS, COMMODITY MARKETS OR FUTURES														