

**Ontario Youth Gambling Report:
Data from the 2009 Ontario Student Drug Use and Health Survey**

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Executive Summary

The Centre for Addiction and Mental Health's Ontario Student Drug Use and Health Survey (OSDUHS) is the longest ongoing school survey of adolescents in Canada, and the second longest in North America. The study has been conducted every two years since 1977. Between November 2008 and June 2009, 9,112 students (65% of selected students) in grades 7 to 12 from 47 school boards, 181 schools, and 573 classes participated in the survey administered by the Institute for Social Research, York University. All data are based on self-reports derived from anonymous questionnaires administered in classrooms.

This report describes gambling activity and gambling problems among Ontario students in 2009, and also examines the relationship between gambling problems and substance use problems, mental health problems, and delinquent behaviours.

Gambling is common among Ontario adolescents, with 42.6% of students reporting involvement in at least one gambling behaviour in the past year. The most common gambling activities are cards and lottery tickets, and the least common are Internet gambling and casino gambling. Gambling increases with grade, and is more common among males than females. Multi-gambling (participating in five or more forms of gambling in the past year) is reported by 3.0% of students.

Problem gambling was defined as a positive response to two or more of the six problem areas identified on the reduced South Oaks Gambling Screen Revised for Adolescents (SOGS-RA-reduced). Problem gambling was seen in 2.8% of the sample and was more common among males than females. The results suggest that there are approximately 29,000 students across the province who are problem gamblers.

After controlling for age and sex, problem gamblers were significantly more likely to report substance-related problems, mental health problems, and delinquency. A total of 68.5% reported a substance use problem, and their odds of reporting these problems were six times higher than for other students. Among mental health problems, suicidality seemed to be a particular concern. A quarter of the problem gambling group reported a suicide attempt in the past year, and they were about 18 times more likely to report a suicide attempt than other students. Delinquent behaviours were also common, including theft and selling drugs. The problem gambling group was 11 times more likely report involvement in gang fights and carrying a handgun, and 20 times more likely to report selling drugs other than cannabis.

While gambling is common among Ontario students and the proportion of students who can be considered problem gamblers is relatively small, the problem gambling group demonstrates problems similar to those seen among adult problem gamblers, namely substance abuse and mental health, delinquency, and criminal problems. Successful measures to prevent gambling problems among adolescents may therefore also prevent serious problems in the adult population.

Table of Contents

1. Introduction and Background	1
2. Method	5
3. Results	10
3.1 Gambling Activity	10
3.2 Gambling Problems	15
3.3 Substance Use Problems	17
3.4 Internalizing Indicators	21
3.5 Delinquent Behaviour	25
4. Discussion	28
5. References	31

1. Introduction and Background

The prevalence of gambling has increased over the past decades. Gambling is now very common in Ontario and among all age groups (Adlaf & Ialomiteanu, 2000; McCready et al., 2008; Paglia-Boak et al., 2010). Among adults, 70% to 80% report participation in one or more forms of gaming at least once in the past year (McCready et al., 2008; Room, Turner, & Ialomiteanu, 1999; Turner et al., 2005; Wiebe, Single, & Falkowski-Ham, 2001; Wiebe, Mun, & Kauffman, 2005). Among adolescents, the rate of gambling participation also appears high (Adlaf & Ialomiteanu, 2000; Derevensky, Gupta, & Winters, 2003; Turner, Macdonald, & Somerset, 2008). The increase in gambling availability in the past decades has sparked concerns about youth gambling and questions about the extent of problems that gambling may be creating among young people (Gupta & Derevensky, 1998a, 1998b; Welte et al, 2008, 2009).

Youth Gambling Prevalence in Ontario

Little information on the prevalence of gambling and gambling problems in Ontario adolescents before the 1990s is available. Based on data collected in 1994, Govoni, Rupcich, and Frisch (1996) reported that in a sample of 965 high school students in Windsor, Ontario, 90% reported participation in one or more gambling activities in the previous year. Govoni and colleagues (1996) noted that this estimate was similar to other estimates of adolescent gambling participation rates at that time. More recently, in a sample of 2,328 adolescents aged 11 to 19 in schools in Southern Ontario, Gupta and Derevensky (2002) reported that 66.7% participated in one or more gambling activities in the past year. Turner and colleagues found that 65% of the students were involved in at least one form of gambling (Turner et al., 2008a). Gambling participation increased steadily with age from only 39% in grade 5 to 65% in grade 7, 80% in grade 9, and 83% in grade 11. Card games were the most common form of gambling (34%), followed by scratch tickets (32%), lottery tickets (26%), games of skill (22%), bingo (22%), sporting events (16%), dice (14%), and pull tabs (12%). Participation was strongly tied to age, with only 39% of grade 5 students reporting gambling and over 80% of grade 11 reporting gambling. A large percentage of the gambling involvement was on non-commercial private bets such as card games, dice games, sports bets, and games of skill. Welte and colleagues (2009) have shown that the availability of legal gambling is tied to gambling participation and problems amongst older youth and young adults.

Questions on gambling began to be included in the Ontario Student Drug Use and Health Survey (OSDUHS) in 1999. The OSDUHS is based on a representative sample of Ontario students in grades 7 to 12, and thus can be used to measure general population estimates for the province. The proportion of Ontario students in 2003 (the first year for which this measure is available) reporting at least one gambling activity during the past year was 57.3%. Males were significantly more likely to report gambling than females, and past year gambling increased significantly with grade. Between 2003 and 2007, the prevalence of gambling among Ontario students declined slightly to 53.2%, while the demographic differences in gambling prevalence remained stable (Paglia-Boak et al., 2010).

Problem Gambling Rates among Adolescents

Problem gambling is a growing concern among adolescents, and according to some studies, rates of problem gambling among youth are higher than those reported by adults (Gupta & Derevensky, 1998a; Jacobs, 2000; National Research Council, 1999; Shaffer & Hall, 1996). Overviews of adolescent problem gambling rates suggest that they may range between 3.4% and 7.4% (Derevensky, Gupta, & Winters, 2003; Shaffer & Hall, 1996), and differences in rates could be related to the populations studied and the measures used to assess gambling problems.

Several studies have reported on adolescent problem gambling rates in Ontario. Govoni et al. (1996) estimated that 8.1% of their sample of Windsor adolescents were problem gamblers, and a further 9.4% were at-risk gamblers, based on the adolescent version of the South Oaks Gambling Screen (SOGS-RA). Gupta and Derevensky (2002) estimated that 4.9% of their Southern Ontario sample were probable pathological gamblers, and an additional 8.0% were at-risk gamblers, based on the DSM-IV-Multiple Response-Juvenile (DSM-IV-MR-J) scale. They also observed that problem gambling rates were higher among males than females and increased with grade.

The first estimate of gambling problems in the OSDUHS was reported by Adlaf and Ialomiteanu (2001). Using the 12-item SOGS-RA, they found that, in 1999, 7.5% of Ontario students in grades 7 through 13 met the criteria for at-risk gambling and 5.8% met the criteria for problem gambling. They also found that more males than females reported at-risk and problem gambling. They found fewer differences by grade than Gupta and Derevensky (2002), although they did observe that rates of problem gambling were lowest in grades 7 and 13.

The 12-item version of the SOGS-RA was used in the OSDUHS between 1999 and 2003. Beginning in 2005, a reduced 6-item version was included based on a ROC (receiver operating characteristic) analysis of the 12-item version. Thus, comparisons of estimates of rates of problem gambling in the OSDUHS must keep this modification in mind. Subsequent estimates of problem gambling in the OSDUHS have been based on a reduced SOGS-RA, with a score of 2 or more on the modified instrument indicating a possible gambling problem. In 2007, 2.3%, or about 24,000 students in the province were classified with a potential gambling problem. Rates of potential gambling problems were higher among males than females (3.5% vs. 1.1%), and increased with grade (reaching 4.1% and 3.2% in grades 11 and 12, respectively).

Relationship of Problem Gambling to Other Problems among Adolescents

Among adults, problem gambling is associated with a wide range of comorbid conditions including other addictions, depression, impulsivity, suicide, alcohol and drug problems, injury, and criminal involvement (Blażczynski & Nower, 2002; McCready et al, 2008; Turner et al., 2008; Turner, et al., 2009). Studies of adolescents suggest similar patterns of comorbidity (Barnes et al., 2005; Gupta & Derevensky, 1998a, 1998b; Magoon, Gupta, & Derevensky, 2005; Turner et al, 2008a; Turner et al., in press). Adolescent problem gamblers may begin gambling at

an early age (Gupta & Derevensky, 1997, 1998b; Wynne et al., 1996) and progress rapidly to problem gambling (Gupta & Derevensky, 1998a). Youth with gambling problems may be deficient in coping skills (Nower, Gupta, & Derevensky, 2004). Welte et al. (2004) found that probable pathological gamblers were significantly more likely to also report alcohol abuse or dependence. Barnes et al. (2005) also reported strong correlations among gambling, drug use, alcohol use, and delinquency. In general, problem gambling is correlated with other addictive behaviours (smoking, drinking, drug use/abuse), and with emotional problems such as depression, low self-esteem, and suicide ideation (Derevensky & Gupta, 2000; Gupta & Derevensky, 1998a; Haroon & Derevensky, 2002). Vitaro et al. (2004) observed that the nature of gambling problems may vary depending on the age at which gambling starts. They found that adolescents who had an early or late onset of gambling took more risks than those adolescents who did not gamble, and that adolescents who had an early onset of gambling showed lower inhibition and were more impulsive than non-gamblers.

Several studies have looked at the prevalence of problem behaviours among adolescents with gambling problems. Research suggests that adolescent problem gamblers may be more likely to use alcohol and other substances and to experience problems with these substances (Gupta & Derevensky, 1998a, 1998b; Kusyszyn, 1972; Lesieur & Klein, 1987; Winters & Anderson, 2000). Turner and colleagues (in press) observed that clusters of young gamblers could be discerned, and that while heavy gamblers and drug-takers formed separate clusters, there were substantial numbers of problem gamblers in both clusters.

Other researchers have examined the association of adolescent problem gambling with the internalizing of problems. Adolescent problem gamblers have been found to be more likely to experience psychological distress, anxiety, and depression (Derevensky & Gupta, 2004; Gupta & Derevensky, 1998). As well, it has been reported that adolescent problem gamblers may be at increased risk for suicidality (Derevensky & Gupta, 2004; Kaminer et al., 2002; Lower et al., 2004).

Available evidence does suggest a relationship between adolescent problem gambling and criminal or delinquent behaviour. Rates of gambling problems appear substantially elevated among incarcerated adolescents (Westphal et al., 1998). Examinations of delinquent behaviours among adolescents often find them associated with gambling or gambling problems (Yeoman & Griffiths, 1996). Adolescent problem gamblers also report higher rates of such behaviours, for example, stealing money (Derevensky & Gupta, 2000).

Purpose of This Report

Gambling problems occur in adolescence and may occur at a higher rate than those seen among adults. It is therefore important to monitor rates of gambling and gambling problems in the adolescent population in order to plan appropriate prevention and treatment initiatives. It is also important to document the kinds of risks or comorbid problems faced by adolescent problem gamblers in order to respond effectively to these problems.

This report will describe gambling behaviour and gambling problems among Ontario adolescents in grades 7 to 12, using data from the 2009 OSDUHS. The value of using data from the OSDUHS is that it permits general population estimates of gambling and gambling problems. The large sample of the OSDUHS also permits an examination of more uncommon behaviours in the problem gambling population.

The main purposes of the report are as follows:

- a) to describe the prevalence of gambling behaviour among Ontario students in grades 7 to 12;
- b) to describe the prevalence of gambling problems among Ontario students in grades 7 to 12;
- and
- c) among students identified with a gambling problem, to describe co-occurring or comorbid problems that they may be experiencing.

2. Method

This section provides an abridged description of the methods used for the 2009 OSDUHS. A more complete description of these methods can be found in Paglia-Boak et al. (2010).

Sampling Design

The OSDUHS employs a stratified (region and school type), two-stage (school, class) cluster sample design. The target population of the OSDUHS is all students enrolled in Ontario's public and Catholic regular school systems. Thus it excludes those enrolled in private schools, those institutionalized for correctional or health reasons, and those on First Nations reserves, military bases, and in the far northern region of Ontario (a total of about 7% of Ontario students).

School and Class Selection

Schools in the public and Catholic school systems in Ontario were eligible to participate. Private schools, schools on Native reserves and Canadian Forces bases, and certain geographically inaccessible northern schools were excluded. The school sample selection occurred as follows:

- (a) To select the initial 2001 sample, schools were drawn from Ontario's Ministry of Education and Training's enrolment data and were stratified according to the four design regions.
- (b) Within each regional stratum, random selections were drawn from both elementary/middle schools and secondary schools. Schools were selected with probability proportional to enrolment size (meaning that larger schools have a greater probability of being selected). The schools that participated in 2001 were invited to participate in cycles since then, including the 2009 cycle. In addition, in 2009 new schools were also selected for specific regional over-samples (see below).
- (c) If a selected school could not participate, or if it had closed, a replacement school from the same region was selected. The sampling frame for new schools and replacement schools was based on the Ministry of Education and Training's 2006/2007 enrolment data (the most recent available), again with probability of selection proportional to size.

Within each selected school, classes were randomly selected by the Institute for Social Research (ISR), which administers the survey on behalf of CAMH. In elementary/middle schools, two classes were randomly selected—one 7th-grade and one 8th-grade. In secondary schools, four classes were randomly selected, one in each grade from 9 to 12. All students in the selected classes were eligible to be surveyed. Special education classes, English as a Second Language (ESL) classes, and classes in which there were fewer than five students were excluded from selection. If a selected class was unable to participate, a replacement class was randomly selected whenever possible.

OSDUHS Regions

Historically, the survey design divided Ontario into four regional strata based on the following boundaries: Toronto; Northern Ontario (Parry Sound District, Nipissing District and farther north); Western Ontario (Peel District, Dufferin County and farther west); and Eastern Ontario (Simcoe County, York County, and farther east).

Over-Sampling for Ontario Public Health Units in 2009

In addition to the four regions described above, the 2009 OSDUHS incorporated six Ontario public health regions as regional strata. The over-sampling of students in these public health regions was conducted in order to provide better regional estimates for the health units. Schools in the following areas of the province were over-sampled: Haliburton-Kawartha-Pine Ridge, Leeds-Grenville-Lanark, Durham Region, York Region, the City of Ottawa, and the City of Hamilton. The class selection procedure in the secondary school over-samples did not differ from the standard procedure. However, in the elementary/middle schools, rather than the standard selection of one class per grade, two 7th-grade and two 8th-grade classes were selected to participate (or all students in these grades if there was fewer than two classes in each).

Procedures

The 2009 OSDUHS protocol was approved by the research ethics boards at CAMH and York University. For each school board associated with a randomly selected school, permission to survey students was first requested from the director of education. Depending on the school board's policy, agreement to participate was conditional upon approval from board research review committees (20 reviewed the protocol), as well as from school principals, classroom teachers, and parents. If a school board did not allow its schools to participate, replacement schools from the same stratum were randomly selected and the respective boards were contacted again for permission. ISR randomly selected the classes to survey in each school.

Consent forms were then distributed to students, who, if they were under age 18, sought the signature of one parent or guardian. Students themselves were also required to provide a signature of assent. Those who did not return a signed consent form before the survey date were not allowed to participate. If a student did not participate, no substitution took place. Instead, the data were statistically weighted to correct for nonresponse.

Survey administration procedures were designed to protect students' privacy by allowing for anonymous and voluntary participation. The survey was administered by trained ISR field staff in the classrooms of the randomly selected classes between November 2008 and June 2009.

The Questionnaire

In addition to alcohol and other drug use, the OSDUHS covers an array of health-related issues. To cover as many content areas as possible in a fixed time period, we employed two versions of the questionnaire, Form A and Form B (www.camh.net/research/osdus.html). In each classroom, half the students were randomly assigned either Form A or Form B. Form A

contained 167 items and Form B contained 169 items, with about two-thirds of the content overlapping. The questionnaire, printed in booklet format, took about 30 to 40 minutes to complete (average time was 32 minutes).

Most of the OSDUHS questionnaire items were derived from other large-scale student surveys such as the American Monitoring the Future (MTF) survey, the American Youth Risk Behavior Survey (YRBS), and the international Health Behaviour of School-Aged Children (HBSC) survey, and have been shown to produce valid and reliable data (Brener, Billy, & Grady, 2002; Currie et al., 2008; Johnston et al., 2008; O'Malley, Bachman, & Johnston, 1983). Also included were valid and reliable screeners and scales, such as the WHO's Alcohol Use Disorders Identification Test (AUDIT) to assess drinking problems (Saunders et al., 1993), the CRAFFT screener to assess drug use problems (Knight et al., 1999), and the Severity of Dependence Scale (SDS) for cannabis (Martin et al., 2006). Each of these screeners was included only in Form A of the questionnaire.

Data Quality

2009 Sample Participation and Characteristics

A total of 181 schools (80 elementary/middle and 101 secondary) in 47 school boards participated in the survey, and a total of 573 classes participated in the survey (207 from elementary/middle schools, 366 from secondary schools). Of the 14,196 students enrolled in these classes, 9,241 participated in the survey. The student participation rate was 65%. Thirteen percent (13%) were lost due to absenteeism, and 22% were lost due to either unreturned consent forms or parents' refusal.

Exclusion criteria were established to enhance data quality. Students were excluded from the final analytic sample if they (1) did not report a valid age; (2) did not report a valid sex; (3) reported the use of a fictitious drug; (4) reported using 10 or more of 13 illicit drugs (excluding cannabis) 40 or more times during the past year ("faking bad"); or (5) did not respond to half or more of the core substance use questions. If a case met any one of these criteria, it was excluded. In 2009, 129 cases were dropped from the data set, comprising a proportion similar to that of past survey cycles. This resulted in 9,112 minimally complete cases used in the data analyses. Form A was completed by 4,851 students, and Form B was completed by 4,261 students. Since the gambling items were included only on Form A, the analyses of gambling and gambling problems reported here are based on the Form A sample of 4,851.

Both the single item nonresponse rate and overall item nonresponse rate were low. Item nonresponse averaged less than 1%. Across all the core questions (i.e., both forms), the average proportion of unanswered questions was 1.5%. All core substance use questions were answered by 96% of respondents. Missing responses to questions were not statistically imputed.

Data Weighting

For several reasons, including the over-sampling of schools/students in various regions, the sample design requires weights to ensure the proper representation of students in relation to the Ontario student population. For each student, the weight is based on the product of five factors: (1) the probability of a school being selected, with probability proportional to size;

(2) the probability of a class being selected; (3) a student nonresponse correction factor; (4) a regional post-stratification adjustment to restore regional representation; and (5) a final post-stratification adjustment to restore the sex distribution by grade, using the most current provincial enrolment numbers. Therefore, our weighted estimates are representative of all students in grades 7 to 12 enrolled in publicly funded schools in Ontario. In other words, our sample of 9,112 students represents about 1,023,900 Ontario students in grades 7 to 12.

2009 Analysis

All 2009 confidence intervals (CIs) were corrected for characteristics of the sampling design (i.e., stratification, clustering, and weighting) using Stata 11.0 Taylor series survey routines (StataCorp, 2009). The analysis was based on a design with 19 strata (region * school type), 181 primary sampling units (schools), and 9,112 students. The statistical significance of subgroup (i.e., sex, grade, region) differences in 2009 was assessed using univariate Pearson chi-square tests corrected for the survey design, at the $p < .05$ level of significance. Odds ratios were calculated using logistic regression models correcting for the survey design, and controlling for the significance of grade and sex. The logistic regression models were assessed at the $p < .05$ level of significance.

Readers should also note the following regarding our analyses:

- Statistically significant differences must be carefully evaluated. First, our analyses do not consider the large number of statistical tests performed. For example, for every 20 statistical tests, one significant difference could occur by chance. Second, outcomes that are statistically significant tell us only that the difference is probably not due to chance.
- Our report is descriptive. Associations found in these data do not imply causal relationships.
- Small percentages and estimates based on a small number of respondents can produce wide confidence intervals and are likely unstable. In this report, estimates were suppressed if they met any one of the following conditions:
 - (i) the estimate was less than 0.5%;
 - (ii) the base sample size was less than 50 students; or
 - (iii) the relative standard error, also known as the coefficient of variation, was greater than a value of 33.3.

Table 2.1 Definitions of Terms Used in this Report

Term	Definition
Any Gambling Activity	Reporting gambling money at 1 or more of 10 gambling activities during the 12 months before the survey
Multi-Gambling Activity	Reporting gambling money at 5 or more of 10 gambling activities during the 12 months before the survey
Gambling Problem	Reporting at least 2 of 6 items from the South Oaks Gambling Screen Revised for Adolescents (SOGS-RA), which measures problems due to gambling during the 12 months before the survey
Hazardous/Harmful Drinking	Scoring at least 8 out of 40 (Likert scoring) on the World Health Organization's Alcohol Use Disorders Identification Test (AUDIT) screen, which measures heavy drinking and alcohol-related problems during the 12 months before the survey
Drug Use Problem	Reporting experiencing at least 2 of the 6 items on the CRAFFT screener, which measures a drug use problem that may require treatment (in the past 12 months)
Cannabis Dependence	Scoring at least 4 out of 15 (Likert scoring) on the cannabis "Severity of Dependence Scale" (SDS). The SDS is a valid and reliable 5-item scale used to screen for drug dependence in adolescent populations.
Any Substance Use Problem	Screening positive on one or more of the three substance problem measures: AUDIT, CRAFFT and SDS
Low Self-Esteem	Reporting at least 3 out of 6 items from the Rosenberg Self-Esteem Scale
Depressive Symptoms	Reporting "often" or "always" experiencing all 4 symptoms on the Centre for Epidemiological Studies Depression (CES-D) subscale during the past 7 days
Elevated Psychological Distress	Reporting experiencing at least 3 of the 12 symptoms on the General Health Questionnaire (GHQ). The GHQ measures symptoms of anxiety, depression, and social dysfunction during the few weeks before the survey
Suicide Ideation	Reporting having seriously considered suicide during the 12 months before the survey
Delinquent Behaviour	Reporting at least 3 of the following 11 delinquent behaviours in the 12 months before the survey: vandalized property, theft of goods worth less than \$50, theft of goods worth \$50 or more, stole a car/joyriding, break and entering, sold cannabis, sold other drugs, ran away from home, assaulted someone (not a sibling), gang fighting, carried a weapon

3. Results

3.1 Gambling Activity

(Figures 3.1 to 3.4)

Starting in 2001, the OSDUHS included questions about gambling activity during the past year. A random half sample of students was asked “*How often (if ever) in the last 12 months have you done each of the following?*” The 11 activities listed below were asked about in 2009.

- *played cards for money?*
- *played bingo for money?*
- *played dice for money? (added in 2003)*
- *bet money in sports pools?*
- *bought sports lottery tickets (such as Sports Select or Proline)?*
- *bought any other lottery tickets, including instant lottery (such as 6-49, Scratch & Win, pull-tabs)?*
- *bet money on video gambling machines, slot machines, or other gambling machines?*
- *bet money at a casino in Ontario?*
- *bet money over the Internet? (added in 2003)*
- *bet money on poker over the Internet? (added in 2007)*
- *bet money in other ways? (added in 2003)*

In this section, we present the percentage of students who report gambling money on each activity at least once in the past 12 months, and the percentage who report at least 1 of 10 activities (excluding Internet poker). In addition, the percentage reporting gambling on 5 or more out of 10 activities (excluding Internet poker) is also presented as an indicator of multi-gambling activity.

3.1.1 Individual Gambling Activities in 2009 (Grades 7 to 12):

- Among all students, the 11 activities ranked in the following manner, from most to least prevalent:

Cards	20.2%
Gambled in other ways	18.8%
Lottery tickets	15.5%
Sports pools	12.6%
Bingo.....	7.2%
Dice.....	6.1%
Sports lottery tickets	5.1%
Video gambling machines..	3.9%
Any Internet gambling	3.0%
Internet poker.....	2.7%
Ontario casinos	1.3%

- ❑ Eight of the 11 gambling activities significantly vary by sex. Males are significantly more likely than females to play cards for money, play dice for money, bet in sports pools, buy sports lottery tickets, play video gambling machines or slots, bet over the Internet, bet at Internet poker, and gamble in other ways not listed. The activities that do not differ by sex are playing bingo, buying lottery tickets, and betting in casinos.
- ❑ There are significant grade differences for 6 of the 11 gambling activities: playing cards, sports pools, sports lottery tickets, other lottery tickets, casino gambling, and playing dice. Generally, these activities increase with grade and peak in grade 12.
- ❑ Only two gambling activities significantly vary by region. Toronto students are least likely to gamble at sports pools compared with students in the other regions. Northern students and western students are most likely to gamble at video gaming machines.

Figure 3.1
Percentage Reporting Gambling Activities in the Past Year by Sex, 2009 OSDUHS

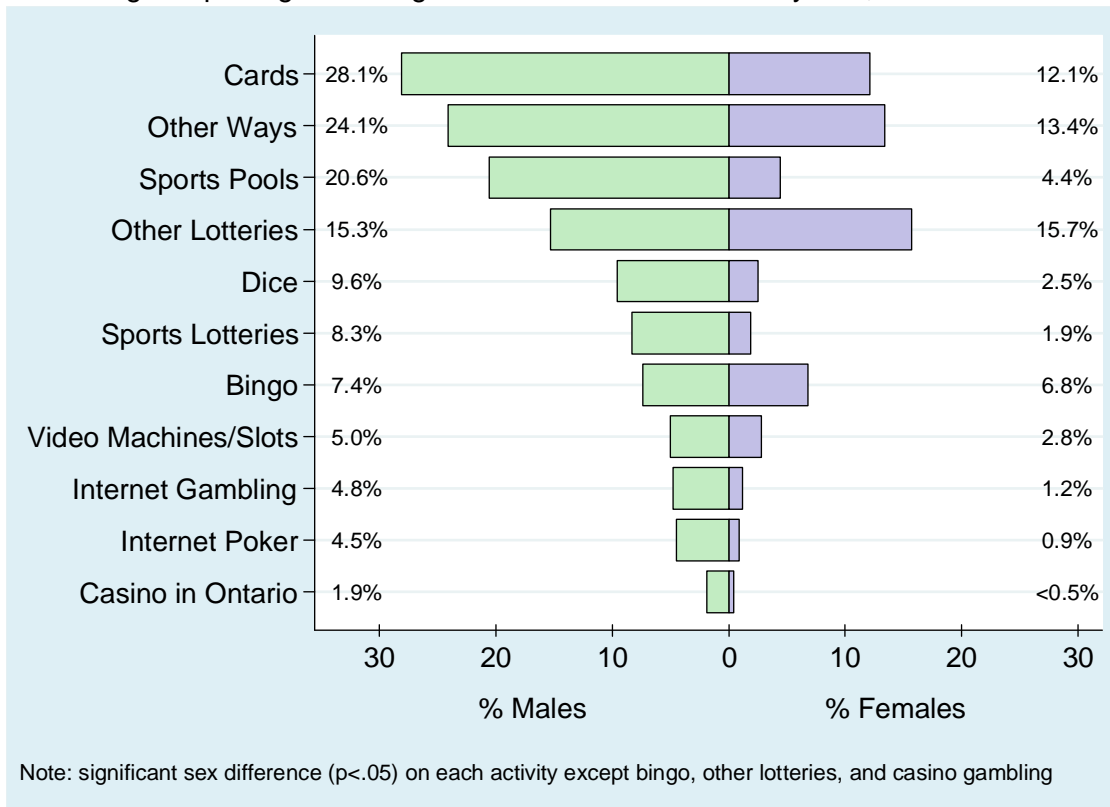
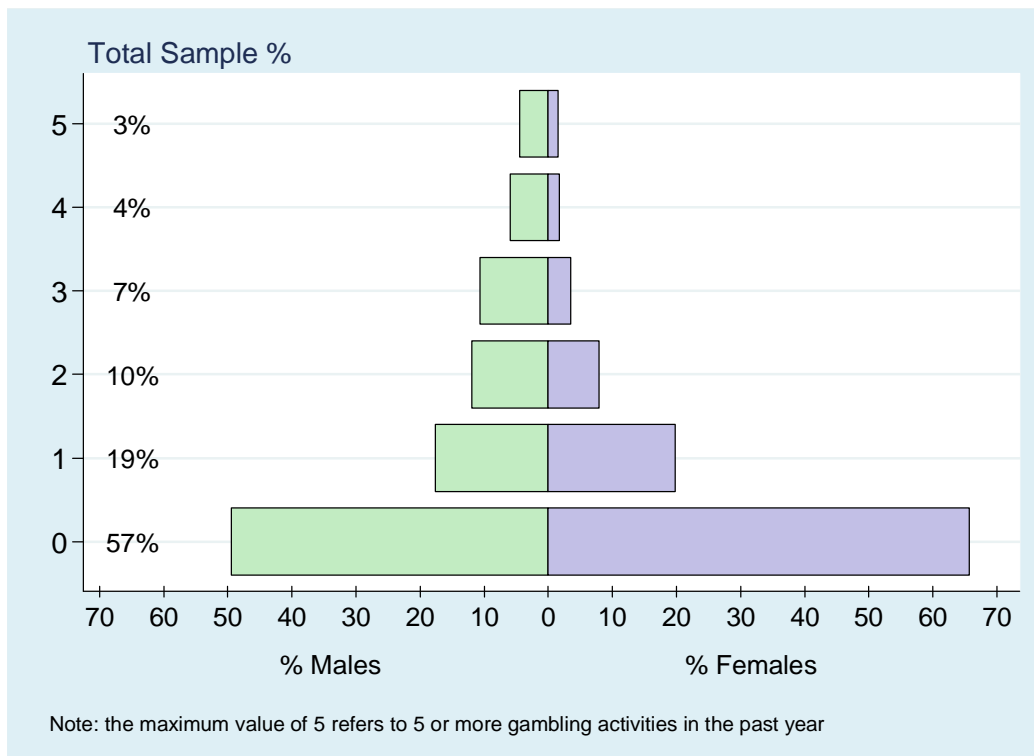


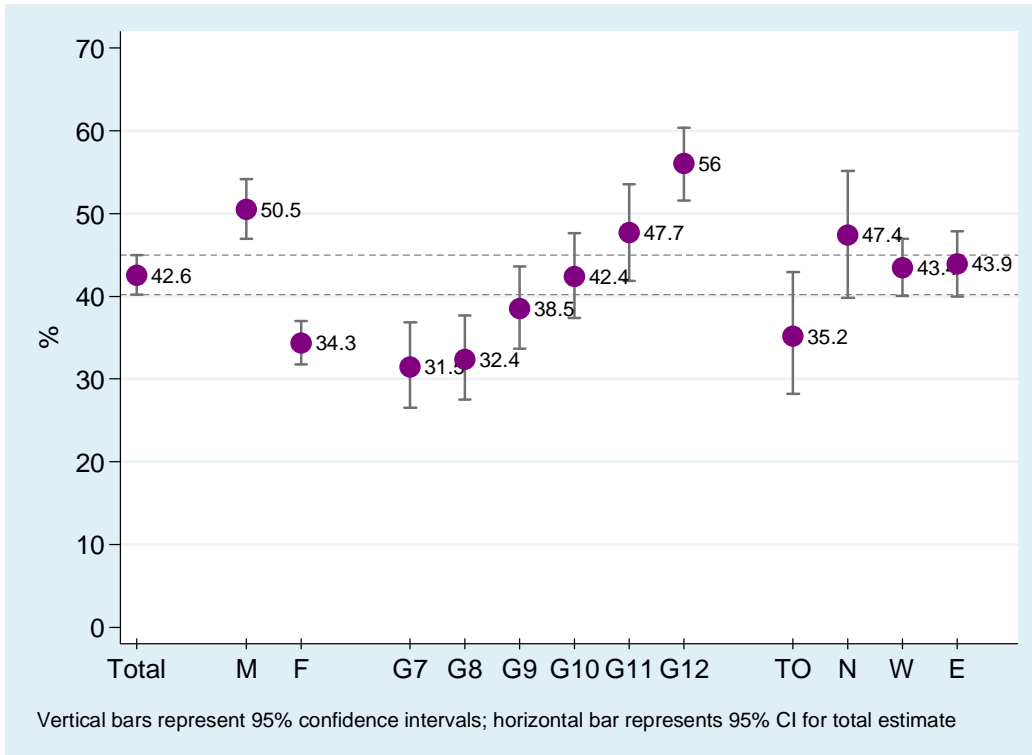
Figure 3.2
Percentage Reporting Number of Gambling Activities (of 10) in the Past Year
by Sex, 2009 OSDUHS



3.1.2 Any Gambling Activity in 2009

- ❑ Among all students, 42.6% (95% CI: 40.2%–45.0%) report at least 1 of 10 gambling activities during the past 12 months. This percentage represents about 452,000 students across Ontario.
- ❑ Males are more likely to report any gambling activity than females (50.5% vs. 34.3%, respectively).
- ❑ There is variation by grade, with 12th-graders (56.0%) most likely to report any gambling activity.
- ❑ There are no significant differences among the regions.

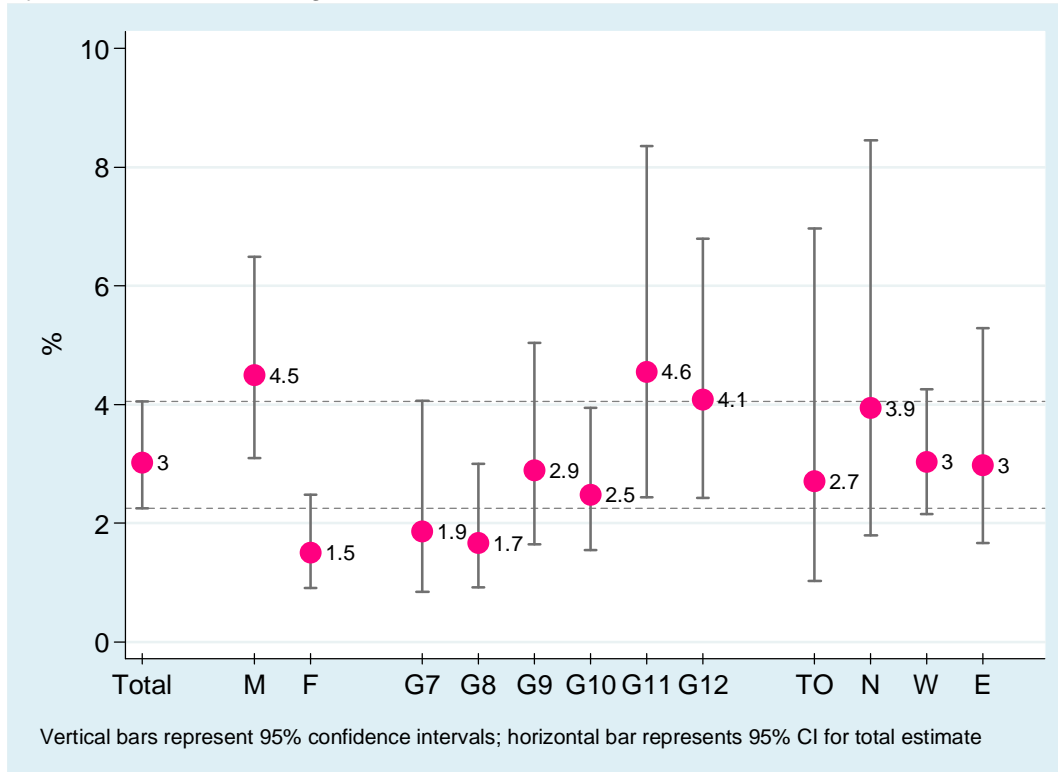
Figure 3.3
Percentage Reporting Any Gambling Activity (of 10 Activities) in the Past Year by Sex, Grade, and Region, 2009 OSDUHS



3.1.3 Multi-Gambling Activity in 2009

- ❑ Among all students, 3.0% (95% CI: 2.2%–4.0%) gambled at five or more activities during the past 12 months. This percentage represents about 32,000 students across Ontario.
- ❑ Males are more likely to report multi-gambling activity than females (4.5% vs. 1.5%, respectively).
- ❑ Despite some variation among the grades regarding multi-gambling activity, these differences are not statistically significant.
- ❑ There are no significant differences among the regions.

Figure 3.4
Percentage Reporting Multi-Gambling Activity (5+/10 Activities) in the Past Year
by Sex, Grade, and Region, 2009 OSDUHS



3.2 Gambling Problems

(Figure 3.5; Table 3.2.1)

Starting in 1999, the OSDUHS asked students about gambling problems using the South Oaks Gambling Screen Revised for Adolescents (SOGS-RA; Winters, Stinchfield, & Fulkerson, 1993). Between 1999 and 2003, the 12-item screen was used, but in 2005 this scale was reduced to 6 items.¹ The following 6 questions were asked, each referring to the past 12 months:

- *Has your betting ever caused any problems for you such as arguments with family/friends, problems at school/work?*
- *Have you ever gambled more than you had planned to?*
- *Has anyone criticized your betting or told you that you had a gambling problem, regardless of whether you thought it was true or not?*
- *Have you had arguments with family/friends because of the money you spend on gambling?*
- *Have you ever skipped or been absent from school or work due to betting activities?*
- *Have you borrowed money or stolen something in order to bet or to cover gambling debts?*

Students were also asked about the largest amount of money gambled in the past 12 months, with response options ranging from \$1 or less to \$200 or more.

To identify those who may have a gambling problem, we examined the percentage that answered positive to two or more of the six questions. The reliability coefficient (α) for these items is 0.71.

- Among only those indicating that they gambled in the past year, the majority (87%) report that the largest amount of money gambled was less than \$50. About 6% report gambling between \$50 and \$99; 2% report between \$100 and \$199; and another 5% report spending \$200 or more.
- Overall, 2.8% (95% CI: 2.0%–3.9%) of students have a gambling problem. This percentage represents about 29,000 Ontario students.
- Males are more likely than females to be at risk for a gambling problem (4.3% vs. 1.2%, respectively).
- Although there is some variation among the grades regarding the likelihood of a gambling problem, these differences are not statistically significant.
- There is no significant variation by region.

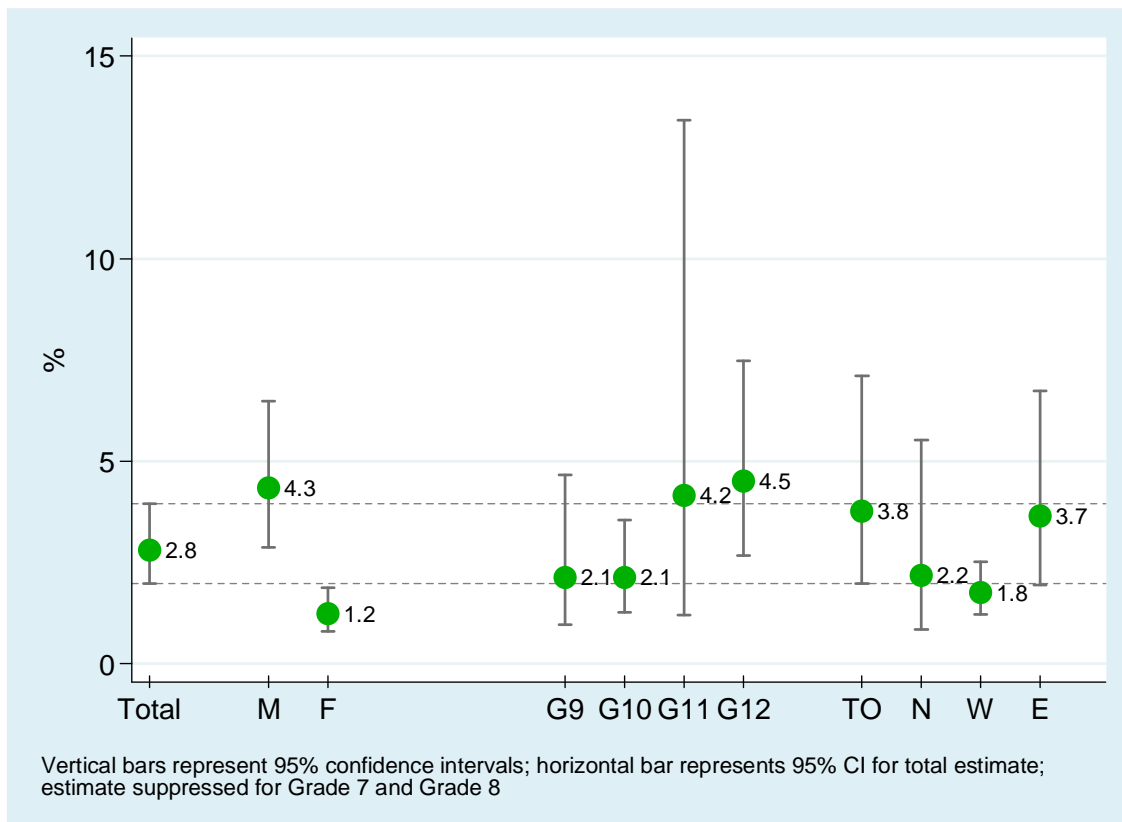
¹ A ROC analysis on the 2003 data was performed to reduce the number of SOGS items from 12 to 6 in 2005, and to determine the corresponding cut-off for a gambling problem.

Table 3.2.1 Percentage of All Students Reporting SOGS-RA-Reduced Gambling Problem Indicators Experienced During the Past Year, 2009 OSDUHS (Grades 7 to 12)

South Oaks Gambling Screen Items (Reduced)	Total Sample (N=4,851)	Males (N=2,286)	Females (N=2,565)
1. Gambled more than you had planned to	4.3	7.0	1.6 *
2. Betting caused problems such as arguments with family/friends, problems at school/work	1.9	2.6	1.3 *
3. Skipped or been absent from school or work due to betting activities	1.9	2.6	1.2
4. Anyone criticized your betting or told you that you had a gambling problem, regardless of whether you thought it was true or not	1.6	2.6	0.5 *
5. Borrowed money/stolen something in order to bet or to cover gambling debts	1.5	2.0	1.0
6. Had arguments with family/friends because of the money you spend on gambling	1.4	2.1	0.6 *

Notes: (1) entries are the percentages responding “Yes”; (2) N=number of students surveyed; (3) * indicates significant sex difference, $p < .05$; (4) based on a random half sample

Figure 3.5
Percentage of All Students Indicating a Gambling Problem (Reduced SOGS-RA) by Sex, Grade, and Region, 2009 OSDUHS



3.3 Substance Use Problems

(Table 3.3.1)

This section examines the relationship between problem gambling and the following substance use problems: hazardous drinking, drug use problems, and cannabis dependence. These three measures will first be considered individually, and will then be aggregated as a composite measure of a substance use problem. While it could be argued that each of these substances has a unique etiology and developmental trajectory, the aggregation of a broad substance use measure allows us to estimate the prevalence of *any* substance use problem among youth with a gambling problem.

3.3.1 Hazardous/Harmful Drinking (AUDIT)

The OSDUHS includes the Alcohol Use Disorders Identification Test (AUDIT), which was developed by the World Health Organization (Saunders et al, 1993). This instrument is designed to detect problem drinkers at the less severe end of the spectrum of alcohol problems. The AUDIT assesses hazardous and harmful drinking. Hazardous drinking refers to an established pattern of drinking that increases the likelihood of future medical and physical problems (e.g., accidents), whereas harmful drinking refers to a pattern of drinking that is already causing damage to one's health (e.g., alcohol-related injuries). Those with a score of 8 or more (out of 40) are considered to be drinking at a hazardous or harmful level. We restrict the term to "hazardous" for convenience.

The 10 AUDIT questions ask students "*How often during the past 12 months, have you...*"

- *frequently drunk alcohol?*
- *usual number of drinks on a typical day when drinking*
- *had five or more drinks on one occasion?*
- *found that you were not able to stop drinking once you started?*
- *often done things not supposed to because of drinking?*
- *often needed a drink first thing in the morning to get yourself going after a heavy drinking session?*
- *had a feeling of guilt or remorse after drinking?*
- *been unable to remember what happened the night before because you had been drinking?*
- *or someone else been injured as the result of your drinking?*
- *had someone suggest that you cut down on your drinking?*

Problem Gambling and Hazardous Drinking Behaviour in 2009:

- ❑ Overall, 20.8% (95% CI: 18.8% –22.9%) of students in grades 7 to 12 report drinking at a hazardous level. This represents approximately 211,000 students in grades 7 to 12 across Ontario.
- ❑ According to problem gambling status, 48% of problem gamblers report hazardous drinking behaviour versus only 20% of non-problem gamblers.

- After controlling for the effects of sex and grade, problem gamblers are three times more likely than non-problem gamblers to report hazardous drinking behaviour.

3.3.2 Drug Use Problem

The OSDUHS includes the six-item “CRAFFT” screener in order to gauge drug use problems experienced by students (Knight et al., 1999). The six items pertain to problems experienced during the past year. A total score of two or more problems is used to identify adolescents who have a drug use problem—that is, those who may be in need of treatment.

The students were asked: “*During the past 12 months, have you...*”

- *used drugs to relax or fit in?*
- *used drugs alone?*
- *forgotten things while using drugs?*
- *gotten into trouble while on drugs?*
- *had family say to cut down on drugs?*

The reliability coefficient (α) for these six items is 0.78.

Problem Gambling and Drug Use Problems in 2009:

- Overall, 15.5% (95% CI: 14.2%–16.9%) of students report a drug use problem. This represents approximately 164,000 students in grades 7 to 12 across Ontario.
- According to problem gambling status, 46.5% of problem gamblers report a drug use problem versus approximately 14.8% of non-problem gamblers.
- After controlling for the effects of sex and grade, problem gamblers are four times more likely than non-problem gamblers to report a drug use problem.

3.3.3 Cannabis Dependence

The OSDUHS includes the Severity of Dependence Scale (SDS) for cannabis use (Martin et al., 2006). The SDS is a valid and reliable five-item scale used to screen for dependence in adolescent populations.

The five questions used were:

- 1) *In the last three months, how often was your use of cannabis out of control?*
- 2) *In the last three months, how often did the idea of missing a smoke of cannabis make you feel very anxious or worried?*
- 3) *In the last three months, how much did you worry about your use of cannabis?*
- 4) *In the last three months, how often did you wish you could stop using cannabis? And*
- 5) *How difficult would it be for you to stop or go without using cannabis?*

The response options for items #1, 2, and 4 were: never used, did not use in the last three months, never, sometimes, often, and always. Responses for item #3 were: never used, did not use in the last three months, not at all, a little, quite a lot, and a great deal. Responses for item #5 were: don't use, not difficult, quite difficult, very difficult, impossible. Each item was scored on a 4-point scale and scores were summed. A total score of 4 or more (out of 15) indicates cannabis dependence. The reliability coefficient (α) for these five items is 0.77.

Problem Gambling and Cannabis Dependence in 2009:

- ❑ Overall, 2.8% (95% CI: 2.2%–3.7%) of students report cannabis dependence. This represents approximately 29,000 students in grades 7 to 12 across Ontario.
- ❑ According to problem gambling status, 24% of problem gamblers report cannabis dependence versus 2.3% of non-problem gamblers.
- ❑ After controlling for the effects of sex and grade, problem gamblers are 11 times more likely than non-problem gamblers to report cannabis dependence.

3.3.4 Any Substance Use Problem

This section examines the substance use problems as a composite measure, with any one of hazardous drinking, drug use problems, or cannabis dependency being considered under the umbrella of a substance use problem.

Gambling Problems and Any Substance Use Problem in 2009:

- ❑ Overall, 26% (95% CI: 23.4%–27.9%) of students have at least one substance use problem. This represents approximately 259,000 students in grades 7 to 12 across Ontario.
- ❑ Among those with a gambling problem, 68.5% have at least one substance use problem.
- ❑ After controlling for the effects of sex and grade, problem gamblers are approximately six times more likely than non-problem gamblers to have at least one substance use problem.

Table 3.3.1 Percentage of Problem Gamblers and Non-Problem Gamblers Reporting Substance Use Problems, 2009 OSDUHS (Grades 7 to 12)

Indicator	Problem Gamblers (N=95)	Non-Problem Gamblers (N=4,603)	Odds Ratio	95% CI
Hazardous drinking	48.0%	20.0%	3.0	1.0–9.3
Drug use problem	46.5%	14.8%	4.0	2.2–7.2
Cannabis dependence	24.0%	2.3%	11.0	5.3–22.6
Any substance use problem	68.5%	24.9%	6.1	2.2–17.4

Notes: (1) odds ratios based on logistic regression models controlling for the effects of age and sex; (2) all odds ratios are significant, $p < .01$; CI=confidence interval

3.4 Internalizing Indicators

(Table 3.4.1)

This section examines the relationship between problem gambling and the following internalizing indicators: elevated psychological distress, low self-esteem, depression symptoms, and suicidality.

3.4.1 Elevated Psychological Distress

The General Health Questionnaire (GHQ; Goldberg et al., 1997; Goldberg & William, 1988) is a screening instrument used to detect current psychological distress. The GHQ-12 uses 12 items to screen for three overarching problems: depressed mood, anxiety, and problems with social functioning. It is important to note that this instrument is used as a screener and not for clinical diagnosis.

The GHQ items have the following wording: “*Over the last few weeks, have you...*” Response categories are on a 4-point scale ranging from “better [more so] than usual” to “much less than usual”; or “not at all” to “much more than usual.” The following items were used:

- *been able to concentrate on whatever you’re doing?*
- *felt that you are playing a useful part in things?*
- *felt capable of making decisions about things?*
- *been able to enjoy your normal day-to-day activities?*
- *been able to face up to your problems?*
- *been feeling reasonably happy, all things considered?*
- *lost much sleep because you were worried about something?*
- *felt constantly under stress?*
- *felt you couldn’t overcome difficulties?*
- *been feeling unhappy and depressed?*
- *been losing confidence in yourself?*
- *been thinking of yourself as a worthless person?*

The GHQ yields a summary measure to estimate the percentage experiencing “elevated psychological distress,” defined as reporting at least 3 of the 12 symptoms (positive statements were reverse-coded). The reliability coefficient (α) for these 12 items is 0.87.

Problem Gambling and Elevated Psychological Distress in 2009:

- ❑ Overall, elevated psychological distress is reported by 31.0% (95% CI: 29.1%–32.9%) of students. This represents about 327,000 Ontario students.
- ❑ According to problem gambling status, elevated psychological distress is reported by 61% of problem gamblers. Approximately 30% of non-problem gamblers report elevated psychological distress.

- ❑ After controlling for the effects of sex and grade, problem gamblers are approximately four times more likely than non-problem gamblers to report elevated psychological distress.

3.4.2 Low Self-Esteem

Items adapted from the Rosenberg Self-Esteem Scale (Rosenberg, Schooler, & Schoenback, 1989) have been in the OSDUHS since 1993. The following six items were used:

- *I feel good about myself*
- *I feel that I am a person of worth*
- *I am able to do most things as well as other people can*
- *Sometimes I feel that I can't do anything right*
- *I feel I do not have much to be proud of*
- *Sometimes I think I am no good at all*

Each item has a 5-point response scale, ranging from “never true” to “almost always true.” An overall indicator of low self-esteem is defined here as responding negatively (lower esteem) to at least three of the six items listed above (i.e., “always” or “often true” for negative statements; “never” or “seldom true” for positive statements). The reliability coefficient (α) for these six items is 0.73.

Problem Gambling and Low Self-Esteem in 2009:

- ❑ Overall, under one in ten (8.3%; 95% CI: 7.3%–9.5%) students indicate low self-esteem.
- ❑ Broken down by problem gambling status, only 7.8% of non-problem gamblers indicate low self-esteem while 28.8% of problem gamblers indicate low self-esteem.
- ❑ After controlling for the effects of sex and grade, problem gamblers are approximately six times more likely than non-problem gamblers to indicate low self-esteem.

3.4.3 Depressive Symptoms

Depressed mood is a relatively common occurrence during adolescence and is characterized by pervasive feelings of sadness and worthlessness, loss of interest in activities, and disturbances in sleep, appetite, and concentration. Depression can range from mild to severe, and can adversely affect all areas of life. The Center for Epidemiologic Studies Depression (CES-D) subscale is a self-report scale used to screen for depressive symptomatology in the general population (Radloff, 1977). Note that this is a screening tool and cannot be used for a clinical diagnosis of depression.

The following four CES-D questions were asked, with the time referent being the “past 7 days.”

- *How often have you felt sad?*
- *How often have you felt lonely?*
- *How often have you felt depressed?*
- *How often have you felt like crying?*

The response options were based on a 4-point scale, ranging from “never or rarely” to “always.” To gain a sense of the prevalence of depression in the student population, we provide a measure of depressive symptoms as indicated by those responding “often” or “always” on all four symptoms. The reliability coefficient (α) for these four items is 0.85.

Problem Gambling and Depressive Symptoms in 2009:

- ❑ Overall, 16.4% of students felt sad often or always during the seven days before the survey; 12.8% felt lonely; 11.4% felt depressed; and 13.3% felt like crying often or always during the past seven days.
- ❑ About one in twenty (5.4%; 95% CI: 4.4%–6.6%) students report depressive symptoms. This represents about 56,000 Ontario students.
- ❑ According to problem gambling status, 14.7% of problem gamblers report depressive symptoms, while 5.2% of non-problem gamblers report depressive symptoms.
- ❑ After controlling for the effects of sex and grade, problem gamblers are approximately five times more likely than non-problem gamblers to indicate low self-esteem.

3.4.4 Suicide Ideation and Suicide Attempt

Starting in 2001, the OSDUHS included a question about suicide ideation. Specifically, students were asked: “*In the last 12 months, did you ever seriously consider attempting suicide?*” Starting in 2007, students were also asked about attempts: “*In the last 12 months, did you ever actually attempt suicide?*” Response options to both questions were yes or no.

Problem Gambling and Suicidality in 2009:

- ❑ About 9.5% (95% CI: 8.3%–10.8%) of students reported that they had seriously considered suicide in the past year. This percentage represents about 99,000 Ontario students. About 2.8% (95% CI: 2.2%–3.5%) of students report attempted suicide in the past year. This represents about 29,000 Ontario students.
- ❑ Approximately 26% of problem gamblers report seriously considering a suicide attempt during the past year, and one-quarter (25%) of all problem gambling students report a suicide attempt during the past year.

- After controlling for the effects of sex and grade, problem gamblers are four times more likely than non-problem gamblers to have seriously considered committing suicide, and are nearly 18 times more likely to report a suicide attempt.

Table 3.4.1 Percentage of Problem Gamblers and Non-Problem Gamblers Reporting Internalizing Problems, 2009 OSDUHS

Indicator	Problem Gamblers (N=95)	Non-problem Gamblers (N=4,603)	Odds Ratio	95% CI
Elevated psychological distress	61.0%	30.2%	4.2	2.4 - 7.6
Low self-esteem	28.8%	7.8%	5.7	2.7 - 11.8
High risk for depression	14.7%	5.2%	4.8	1.9 - 12.2
Suicide ideation	26.1%	9.0%	4.0	1.9 - 8.2
Suicide attempt	25.3%	2.2%	17.8	6.5 - 44.7

Notes: (1) odds ratios are based on logistic regression models controlling for the effect of age and sex; (2) all odds ratios are significant, $p < .01$; (3) CI=confidence interval

3.5 Delinquent Behaviour

(Table 3.5.1)

Since 1991, the OSDUHS has asked students about engaging in violent and non-violent delinquent behaviours. This section looks at the percentage of students engaging in delinquent behaviours at least once during the past year. Specifically, the questions used were: “*How often (if ever) in the last 12 months have you done each of the following...*”

Non-Violent Acts

- *taken a car without permission*
- *banged up or damaged something on purpose (vandalism)*
- *sold marijuana or hashish*
- *taken things worth \$50 or less*
- *taken things worth more than \$50*
- *broken into a locked building (excluding home)*
- *sold drugs other than marijuana or hashish*
- *run away from home*
- *set something on fire that you weren't supposed to*

Violent Acts

- *beat up or hurt anyone (excluding sibling fights)*
- *taken part in gang fights*
- *carried a weapon (e.g., gun or knife)*
- *carried a handgun*

An overall measure of delinquency was created, based on the 11 items used since 1991 (this excludes “set something on fire” and “carried a handgun”). Overall delinquent behaviour is defined here as participating in 3 or more of the 11 delinquent acts during the past year.

3.5.1 Problem Gambling and Overall Delinquent Behaviour in 2009:

- ❑ Overall, 10.7% (95% CI: 9.3%–12.2%) of students report delinquent behaviour (defined as 3 or more of 11 behaviours). This percentage represents approximately 113,000 students.
- ❑ 62.2% of problem gamblers report 3 or more delinquent behaviours during the past 12 months versus 9.7% of non-problem gamblers.
- ❑ After controlling for the effects of sex and grade, problem gamblers are 12.5 times more likely than non-problem gamblers to report overall delinquent behaviour.

3.5.2 Problem Gambling and Non-Violent Delinquent Behaviour in 2009:

- Among problem gamblers, the nine non-violent behaviours ranked in the following manner, from most to least prevalent:

Vandalism	53.7%
Theft under \$50.....	51.4%
Theft over \$50.....	44.5%
Ran away from home	42.7%
Fire setting	41.8%
Take car without consent	41.7%
Sell marijuana or hashish	31.1%
Sell drugs other than marijuana	29.2%
Break and enter	24.7%

- Problem gamblers are much more likely than non-problem gamblers to engage in all of these non-violent behaviours. Specifically, after controlling for the effects of sex and grade, problem gamblers are 5 times more likely than non-problem gamblers to report selling marijuana and approximately 20 times more likely to sell drugs other than marijuana; problem gamblers are five times more likely than non-problem gamblers to report stealing something worth \$50 or less, and are 14 times more likely to report stealing something worth \$50 or more; problem gamblers are eight times more likely than non-problem gamblers to report taking a car for a ride without permission, and six times more likely to report a break and entry during the past 12 months; problem gamblers are more than nine times more likely than non-problem gamblers to report running away from home during the past 12 months; problem gamblers are three times more likely than non-problem gamblers to report fire setting and seven times more likely to report vandalism.

3.5.3 Problem Gambling and Violent Delinquent Behaviour in 2009:

- Among problem gamblers, the four violent behaviours ranked in the following manner, from most to least prevalent:

Assault.....	47.4%
Carry a weapon	31.8%
Gang fight	23.8%
Carry a handgun.....	14.4%

- Problem gamblers are much more likely than non-problem gamblers to engage in each of these violent behaviours. Specifically, after controlling for the effects of sex and age, problem gamblers are over 11 times more likely than non-problem gamblers to report participating in a gang fight or carrying a handgun; problem gamblers are seven times more likely than non-problem gamblers to engage in assault; problem gamblers are almost five times more likely than non-problem gamblers to carry a weapon.

Table 3.5.1 Percentage of Problem Gamblers and Non-Problem Gamblers Reporting Non-Violent Delinquent Behaviours, 2009 OSDUHS

Indicator	Problem Gamblers (N=95)	Non-Problem Gamblers (N=4,603)	Odds Ratio	95% CI
Non-Violent Behaviour				
Theft under \$50	51.4%	13.4%	5.5	3.1–9.8
Theft over \$50	44.5%	4.3%	14.5	7.9–26.6
Vandalism	53.7%	12.7%	6.8	3.9–11.9
Break and enter	24.7%	4.0%	6.1	3.4–11.0
Take car without consent	41.7%	29.4%	8.2	3.9–17.2
Sell marijuana or hashish	31.1%	5.9%	5.3	2.9–9.5
Sell other drugs	29.2%	1.5%	19.6	10.4–36.9
Ran away from home	42.7%	7.9%	9.3	4.9–17.2
Fire setting	41.8%	14.1%	3.4	1.9–6.2
Violent Behaviour				
Assault	47.4%	9.0%	7.6	3.5 - 16.3
Gang fight	23.8%	2.3%	11.3	5.0 - 25.2
Carry weapon	31.8%	6.8%	4.8	2.4 - 9.6
Carry handgun	14.4%	1.1%	11.2	3.8 - 33.0
Delinquency Scale (3+)	62.2%	9.5%	12.5	6.1 - 24.7

Notes: (1) odds ratios based on logistic regression models controlling for the effect of age and sex; (2) all odds ratios are significant, $p < 0.01$; (3) CI=confidence interval

4. Discussion

Limitations

Several limitations must be kept in mind when interpreting these results. The results are based on self-reports, and thus could be subject to bias from under-reporting or over-reporting. However, self-reports of substance use and other sensitive behaviours have been found to have acceptable validity when information is provided anonymously and with no associated consequences (Adlaf, 2005; Hibell et al., 2003). It is important to note that the results are derived from a cross-sectional survey, and thus causation cannot be inferred from our data. These observations are based on Ontario students in grades 7 to 12, and may not be generalizable to other groups. Finally, our measure of problem gambling is based on a shortened version of the SOGS-RA. Thus, prevalence estimates derived from this instrument may vary from prevalence estimates derived from the full version of the SOGS-RA, or from other measures of gambling problems.

Prevalence of Gambling among Ontario Youth

As with adults, gambling is common among Ontario youth, reported by nearly half (42.6%) of the students. Gambling participation increases with grade, reaching its highest levels in grade 12 at 56%. The most common specific gambling activities reported are cards, lottery tickets and sports pools, and the least common are Internet gambling (including Internet poker) and gambling at casinos. Significant differences in gambling participation by gender exist, with males more likely to gamble than females; the most common activity reported by females is “other lotteries.” Multi-gambling activity (reporting gambling at five or more activities) is not common. A total of 3% of students reported multi-gambling, and this was more common among males (4.5%) than females (1.5%).

In Ontario, the legal age for gambling in casinos is 19, and the data suggest that this regulation is being enforced, in that the proportion of young people reporting casino gambling, at 1.3%, was the lowest of all forms of gambling assessed. The legal age for purchase of lottery tickets is 18, but the evidence reported here suggests that many young people under this age limit may purchase lottery tickets. Further research to understand how lottery tickets may contribute to gambling problems, and how young people are able to obtain them, would seem warranted by these observations.

Consistent with previous studies, much of the gambling among youth involved non-regulated forms of gambling such as card games and sports bets (Gupta & Derevensky, 2002; Welte et al., 2008). As well, it is interesting to note that the prevalence of Internet gambling is low in comparison to other forms of gambling.

Problem Gambling Prevalence, Substance and Mental Health Problems, and Delinquency

The prevalence of gambling problems among Ontario students in grades 7 to 12, as estimated by the SOGS-RA-reduced, is 2.8%. This estimate is similar to those seen in 2005 and 2007 using the brief instrument (4.5% and 2.3%, respectively). While this prevalence is relatively low, it means that there are about 29,000 Ontario students experiencing a gambling problem. Problem gambling is higher among male students than female students (4.3% vs. 1.2%, respectively).

Rates of substance abuse, mental health problems, and delinquency among adolescent problem gamblers appear to be very high. Our results confirm the results of other studies in demonstrating high rates of substance problems among adolescent problem gamblers (e.g., Barnes et al., 2005; Derevensky & Gupta, 2000), and provide a clear indication of the extent of that elevation. While alcohol problems were about three times more likely in the problem gambling group, the increased likelihood of other drug problems was even more pronounced, resulting in a six-times increase in the likelihood of any substance problem.

Similar elevations were seen for mental health problems. Significantly higher levels of psychological distress, risk for depression, low self-esteem, and suicidal ideation were seen among problem gamblers. Other studies have observed higher levels of mental health problems in this group (Derevensky & Gupta, 2000), and our analyses confirm that these problems are common in Ontario adolescent problem gamblers. A very striking finding was that about a quarter of the problem gambling group reported a suicide attempt in the past year, for a risk of suicide attempts about 18 times higher than in the general student population. This finding points to a very serious health risk that this group may be facing. The link between gambling problems and suicide has been reported before (Hodgins et al., 2006; Nower et al., 2004), but this finding is particularly alarming because of the high incidence of reported suicide attempts (25%) among young problem gamblers.

Significantly higher rates of both violent and non-violent delinquency were observed among adolescent problem gamblers. This is consistent with the published literature on gambling problems (Williams et al., 2009). Illegal behaviours that may progress to create significant criminal involvement in adulthood appeared common in this group, including theft, selling cannabis and other drugs, gang involvement, and carrying weapons. While these may result in part from a need to obtain funds to support gambling habits, they also point to the links between gambling and a more deviant lifestyle (Zangeneh et al., 2010), and point to the possible criminogenic influence of gambling involvement among young people, which could account for at least part of the strong relationship between gambling and criminal involvement among adults (Abbott, McKenna, & Giles, 2005).

Implications for Prevention

These results demonstrate that gambling is a common activity among Ontario adolescents. Because of the problems that may occur related to gambling, the prevalence of gambling and gambling problems should continue to be monitored in the province. While the prevalence of gambling problems is relatively low, nevertheless there appears to be about 29,000 students in the province who are experiencing a gambling problem. This group is of particular concern because of the extent of comorbidities they appear to be experiencing. Adolescent problem gamblers are already demonstrating the substance abuse, mental health and delinquency/criminal behaviour problems that are of concern among adult problem gamblers (Derevensky & Gupta, 2004; Turner et al., 2008a). Efforts to prevent gambling problems, and also to identify and intervene with those who have developed a gambling problem, are supported by these data. Effective intervention at this early stage may also prevent a large number of substance abuse, mental health, and criminal problems in the adult population.

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