# 2013 Nova Scotia Adult Gambling Information Collection Project

*Technical Report*

NOVA SCOTIA

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## Acknowledgements

The *2013 Nova Scotia Adult Gambling Information Collection Project* has benefited from the collaboration and assistance of many individuals and groups across the province. The Nova Scotia Department of Health and Wellness wishes to thank the staff of R. A. Malatest & Associates Ltd, Linda Graham, and the adults in Nova Scotia who participated in the survey for their contributions.

Any errors or omissions are solely the responsibility of the Nova Scotia Department of Health and Wellness. This report contains information that was available at the time of data collection between March and June 2013; prevalence data after this period may not be reflected in this report.

The report is available online at
novascotia.ca/dhw/publications.asp
novascotia.ca/dhw/addictions/reports.asp

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# Message from the Deputy Chief Medical Officer of Health

Nova Scotia's Department of Health and Wellness (DHW) is responsible for supporting programs and services that protect and promote the health of Nova Scotians and their families. While gambling provides benefits to our province by generating revenue that can be invested in programs and services across Nova Scotia, we must recognize that gambling also inherently carries risks and can lead to harm, not only for the gamblers but their families and the communities in which they live. It is therefore important that we balance revenue generation with efforts aimed at protecting all Nova Scotians from gambling-related harm.

In order to get a better understanding of gambling behaviours in the Nova Scotia population and the factors contributing to gambling-related harm, DHW commissions population-based surveys and undertakes surveillance on behaviours that affect health. These endeavours help us to understand the health impact of gambling.

Studies concerning the prevalence of gambling and gambling-related harm have been conducted since 1993 to assess and track changes over time in general gambling behaviour and the prevalence of problematic gambling behaviour among Nova Scotians 19 years and older. In the spring of 2013, I invited a randomly selected number of Nova Scotians to participate in our latest survey. I am grateful to everyone who took the time to answer our questions and provide us with valuable information.

This report presents the survey findings and provides Nova Scotians with a picture of gambling in our province. It is aimed at a wide audience; it contains a wealth of technical data that will be of interest to those planning and managing health and community services, but it also aims to inform members of the general public who have an interest in health and well-being in our communities.

We can infer from this report that fewer people in Nova Scotia are gambling. However, those who gamble wager more of their money on gambling activities than reported in previous surveillance reports; this poses a risk for gambling-related harm. The report shows that the highest proportion of risky and problematic gambling behaviours is concentrated among single males, 19–24 years old, of non-European background, with less than high school education, a disability or chronic health condition, and a substance use and/or

mental health disorder. Increasing numbers of older adults are also displaying signs of at-risk and harmful gambling, and a disproportionate number of individuals who play VLTs on First Nations VLT sites are problem gamblers.

These findings highlight the need for better harm reduction and prevention efforts to protect and support Nova Scotians who gamble, their families, and their communities. This is going to require a combined effort from all stakeholders. We have to improve the safety of environments in which people participate in gambling. A focus on harm reduction and prevention in gambling policy decisions will help to achieve this and will allow us to balance the benefits of revenue generation with the need to protect Nova Scotians from gambling-related harm.

**Dr. Frank Atherton**,
Deputy Chief Medical Officer of Health,
Nova Scotia Department of Health and Wellness

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# Executive Summary

The *2013 Nova Scotia Adult Gambling Information Collection Project* (AGICP) explores population-based information about gambling participation and key factors associated with gambling-related harm among adult residents of Nova Scotia (aged 19 years and older),[1] and it is the fifth such project in Nova Scotia. The study examines gambling participation and activities by various demographics (sex, age, population group, income, education, marital status) and in accord with Nova Scotia Health Authority (NSHA) Management Zones to identify the prevalence, expenditures, and factors associated with low- to moderate-risk and problem gambling behaviours. Other components of the report include: general and mental health, well-being, and concurrent substance use among non-gamblers and gamblers; awareness of support services for people at risk of experiencing gambling-related harm; and Video Lottery Terminal (VLT) gambling at First Nations VLT sites. An overview of the socio-spatial configuration of VLTs in the province is also provided.

## Gambling Participation and At-Risk Gambling in Nova Scotia

**Participation –** In 2013, 72.8% of Nova Scotians aged 19 years and older engaged in one or more gambling activities. This represents a 14.2% decrease in gambling participation since 2007. Nevertheless, there were no reductions in low-risk, moderate-risk or problem gambling between 2007 and 2013. While it may appear that the total proportion of gamblers who scored at any level of risk has risen from 6.1% in 2007 to 6.8% in 2013, it is not a statistically significant finding.[2] Estimates from this study indicate that approximately 50,000 Nova Scotians are at some risk of harm related to their gambling, and an estimated 5,000 could be experiencing severe financial, health-related, and social harm as a result of gambling. As shown in this report, a substantial proportion of non-problem gamblers stopped gambling between 2007 and 2013, while a majority of at-risk gamblers continued to participate. This reduction of non-problem gambling creates a noticeable decrease in overall participation in certain gambling activities, a decrease that may lead to the

1 Where appropriate, tests for statistical difference have been conducted and noted throughout the report. As referred to here, statistical significance indicates that a specific result did not occur through random variation or chance and that the same estimated result would be found in the population 95% of the time or p<.05.

2 Small sub-samples of at-risk and problem gamblers decrease the possibility of detecting statistically significant differences.

conclusion that the prevalence of at-risk gambling has increased. However, it is actually the ratio of at-risk and problem gamblers to non-problem gamblers that has increased. For this reason, changes in participation across time should account for varying patterns of participation among risk-level groups and their activities, but such changes are difficult to illustrate accurately with prevalence data.

**Gambling Expenditures –** Self-reported gambling expenditures can be inaccurate due to the time-period covered and the sensitive nature of the questions, leading to problems with recall and social desirability biases. Accordingly, expenditures provided in this report must be viewed with prudence. The average reported monthly expenditure on gambling activities was $33 (standard deviation = $142), with above average expenditures found for the following groups: males, 19–24 years of age, of self-identified aboriginal descent, with less than high-school education, and who are single, separated, or divorced. Monthly expenditures among non-problem gamblers dropped 44% between 2007 and 2013, and those in the low-risk Problem Gambling Severity Index (PGSI) classification reported an average reduction of 72%. No statistically significant differences were found in expenditures between the two time periods for moderate-risk or problem gamblers. It is estimated that at-risk gamblers contributed approximately 42% of provincial gambling revenues in 2013, with 22% coming from gamblers in the PGSI problem category. This is similar to an estimated 40% in 2007, with 21% reported as contributed by problem gamblers (Nova Scotia Department of Health Promotion and Protection, 2008: 69).

**Participation by Gambling Activities –** Gambling in 2013 was highest with weekly lottery tickets and charity raffles and lowest with casino table games, horse-race wagering, and Internet gambling. Compared to 2007, participation has declined in most gambling activities with the exception of casino table games and Internet gambling. The largest decreases have occurred with daily lotteries, VLTs, casino slot machines, and scratch-n-win/breakopen tickets. Moreover, non-problem players were most likely to have stopped gambling which increased the proportion of at-risk and problem gamblers. A number of factors influenced the marketplace and have contributed to the changes in participation and/or expenditure across the risk categories.

**Participation by Demographics: Sex –** Men under the age of 35 reported gambling more than women in the past year; there were no differences by sex above this age. Men also participated in different gambling activities from those of women, reported higher expenditures, and were considerably more at risk for problems related to gambling. It is also notable that males across

all demographic categories had higher rates of participation and increased risk than women. Low-risk-gambling increased among both men and women between 2007 and 2013.

**Participation by Demographics: Age –** Although gambling participation was lowest among respondents aged 19–24, respondents from this age group engaged more in continuous forms of gambling, in particular, VLTs, casino slots, and casino table games,[3] their gambling expenditures were roughly twice those of their counterparts; and they had higher representation in the low-risk PGSI classification. Between 2007 and 2013, low-risk gambling almost doubled in the 19–24 age group, and low- to moderate-risk gambling behaviours increased among people 65 years of age, rising six-fold in the moderate-risk category.

**Population Group –** Overall participation by population group was lowest among Nova Scotians of Asian descent. Respondents who self-identified as aboriginal[4] or African Nova Scotian had the highest rates of gambling across most available forms. Respondents of aboriginal descent had expenditures approximately five times those of the other groups and had the highest proportion of problem gamblers.[5] Those of Asian descent were also highly represented in the low and moderate-risk gambling groups. Respondents from non-European descent overall had higher levels of at-risk and problem gambling than those of European descent.

**NSHA Management Zone –** Participation was highest in the Eastern Zone, and residents in this area gambled on electronic gambling machines (casino slot machines and VLTs) slightly more than in the other NSHA Zones. The Eastern Zone has the highest per capita distribution of VLTs but considerably fewer casino slot machines. The Eastern Zone also had the largest proportion of low-risk gamblers, with no statistical differences for the other PGSI classifications. In addition, the prevalence of low-risk gamblers in the Eastern Zone and Northern Zone increased between 2007 and 2013.

3 Continuous forms of gambling are those in which the outcome is determined soon after making a wager. Examples include scratch-n-win tickets, wagering on horse races, VLTs, casino slot machines, and casino table games (whether offline or online). Faster and more repetitive forms of gambling, like electronic gambling machines (VLTS, casino slot machines), put gamblers at higher risk for gambling-related harm.

4 Aboriginal respondents in this study self-identified as having aboriginal ancestry, and it is unknown what proportion are First Nations (Mi'kmaq), Mètis, or Inuit.

5 Breen & Gainsbury (2013: 77) suggest that standardized screens for measuring problem gambling among Aboriginal groups may be culturally inappropriate and could inflate estimates of problem gambling.

**Household Income –** Although gambling participation increases with household income and those with a household income above $60,000 had the highest rates of past-year participation, respondents in the lower income categories most frequently scored in the low- to moderate-risk category, and those in the medium income group had the highest proportion of problem gamblers. Those in the lowest income category gambled on daily lotteries and VLTs, while those in the middle income group gambled on scratch-n-win/breakopen tickets and VLTs. No statistical difference in gambling expenditures was found by level of household income, which may explain the inverse relationship of income and at-risk gambling: low and middle-income households may not have the financial buffer to offset losses. Increased low-risk gambling was observed between 2007 and 2013 among the lowest and highest income categories.

**Education –** Higher proportions of respondents with less than high school education were at-risk or problem gamblers, compared to respondents who had attended or completed community college or university. When education is combined with income, respondents with high school education or lower and an income of less than $30,000 participated ten times more than those from other groups, and 6.2 % of this group were in the moderate-risk PGSI category, compared to 2.4% in the remainder of the sample ($p<.05$). The demographic categories of high school education or less experienced a slight increase in low-risk gambling during the period 2007 to 2013.

**Marital Status –** Married respondents had participated in gambling most in the previous year, and those widowed the least. The latter fact is likely affected by age, since half of those above 80 years of age had not participated and were most represented in the widowed category. Although respondents not currently married or living common law gambled less, they were more inclined to engage in continuous forms of gambling and to have higher expenditures. Single respondents had higher proportions in the low-risk and problem gambling classifications than those from all other marital categories. There was also an increase in low-risk gambling among the single and the married or common-law groups between 2007 and 2013.

**Difficulties Associated with Low- to Moderate-risk and Problem Gambling –** Approximately two-thirds of problem gamblers indicated their gambling behaviours had negatively affected their family finances; half reported troubles for their families; one-quarter pointed to workplace difficulties; and one-fifth stated it had caused problems for friends. This was reflected in reports from

non-gamblers and non-problem gamblers. Slightly more than one-quarter of these respondents felt that a spouse, partner, close relative, or close friend currently had a gambling problem or had one in the past. Slightly more than 7% agreed that a person's gambling had made things more difficult for them; 8.7% indicated someone's gambling had created problems for their family, 15% reported gambling as negatively affecting their friends, and 5.4% felt that a problem gambler had caused adverse effects where they worked.

## Gamblers' General Health, Well-Being, and Concurrent Substance Use

**Health Status –** Compared with non-gamblers and non-problem gamblers, all at-risk and problem gamblers were much less likely to report excellent health and more likely to claim past-year deterioration in their health. Moderate-risk and problem gamblers indicated that they had mood and anxiety disorders more often than members of other groups, and problem gamblers reported suicidal ideation 5.5 times more often and suicide attempts 8.0 times more often relative to the remainder of the sample. Although suicidal ideation and attempts at suicide increased among all respondents who stated they had mood and/or anxiety disorders, these increases were disproportional among moderate-risk and problem gamblers. Physical and mental health issues, suicidal thoughts, and suicide attempts are intertwined. Clearly, problem gamblers are most vulnerable, especially when they have concurrent disorders; however, these factors require further examination to determine the relationships between them.

**Concurrent Substance Use –** Alcohol consumption was higher among non-problem and problem gamblers than those in the low to moderate PGSI categories. However, high-risk drinking (consuming more than 5 drinks in a sitting) increased with levels of the PGSI. Almost half of problem gamblers had engaged in high-risk drinking, a ratio approximately eight times that of non-problem gamblers. Two-thirds of problem gamblers were daily smokers, compared with approximately 14% of non-problem gamblers and non-gamblers. Moderate-risk and problem gamblers also used tranquilizers more than eight times that by the remainder of the sample. In addition, problem gamblers' use of over-the-counter sleep medications, prescription pain medications, and marijuana was higher than that of the remaining groups. With regard to pain medications, no differences were observed among all respondents *with* chronic health conditions, but approximately one-quarter of problem gamblers *without* a chronic health condition had used these medications, which was considerably higher than for the other groups.

## Awareness of Support Services for At-Risk Gamblers and their Families

**Awareness of Support Services for Low- to Moderate-risk and Problem Gamblers –** Recognition of services for gamblers who require assistance declined slightly between 2007 and 2013. There were no differences among non-gamblers or in the level of risk for problem gambling. Awareness increased with age, income, and education. Residents in the Eastern Zone registered the greatest awareness, and those in the Western Zone the least. When non-gamblers were removed from the analysis, no difference in awareness of support services was found between the Eastern and Central Zones. A small percentage of low and moderate-risk gamblers claimed to have sought support from family, friends, or formal services. No problem gamblers reported seeking help.

**Awareness of Support Services for Families of Low- to Moderate-risk and Problem Gamblers –** Awareness of family support services was slightly lower among gamblers and has also declined marginally between the two periods. Moderate-risk gamblers reported awareness most, and problem gamblers the least. Levels of awareness by demographics such as sex, age, and region were very similar to the level of awareness of support services for gamblers experiencing gambling-related harm.

## VLT Gambling at First Nations' VLT Sites

In 1995, the government of Nova Scotia entered into a series of gambling agreements with Mi'kmaq First Nations (FN), and each participating band has a separate agreement to operate VLTs.

**Participation –** Approximately one-quarter of all VLT gamblers had visited a First Nations' VLT site in the past year. Participation was highest among VLT players above 55 years of age with medium household income, lower education, and residence in the Eastern or Western Zones. Among all VLT players of European ancestry, one-fifth had gambled at an FN VLT venue, compared with approximately half of aboriginal VLT players. VLT gamblers who visited FN VLT venues went more frequently to FN sites than to non-FN sites, and were more likely to report chronic illness or disability and describe their health as having deteriorated in the last year.

**Low- to Moderate-risk and Problem Gambling –** VLT gamblers who visited an FN VLT venue fell within the problem gambling category three times more often than those who had not. No statistically significant differences were found for low- to moderate-risk gambling. The profile of problem gamblers who reported going to a FN VLT site mirrors that of other problem gamblers in the sample.

## Spatial Distribution of VLTs

VLTs in Nova Scotia are spatially segmented into lower socioeconomic status (SES) neighbourhoods, although this phenomenon may be more a function of structural factors than of market influences. For example, non-FN VLTs in Nova Scotia are solely permitted in liquor-licensed lounges and Royal Canadian Legion venues,[6] which are not typically situated in higher SES neighbourhoods. Nevertheless, the locations of VLTs has important implications from a public health perspective (e.g., density of outlets, physical availability). Williams et al. (2015: 139) argue that while proximity to Electronic Gambling Machines (EGM) has a weak causal impact on the onset of problem gambling, it is a strong predictor of perpetuation of problem gambling and/or relapse among those who have difficulties with EGM gambling. Higher concentrations of VLTs in lower SES areas is not unique to Nova Scotia, and experiences from other jurisdictions may help describe and better understand potential public health issues.

In summary, the 2013 AGICP provides information useful for the development of policies and services and supports. At-risk and problem gambling is a complex issue that requires a comprehensive and collaborative approach among stakeholders, focusing on (1) legislative and regulatory levers and protective features on products; (2) public awareness and education; (3) continuum of services and supports for individuals and their families experiencing harm associated with gambling; (4) monitoring and surveillance; and (5) health practitioner education and support. Focusing on only one facet of the issue will do little to address the harm of gambling to society.

6 The Royal Canadian Legion is a community service organization that supports military veterans and their families. Legion branches have venues that function as community centres and often include liquor-licensed lounges, dance halls, bingo halls, banquet halls, and other leisure facilities.

# Introduction and Methodology

## Introduction

The 2013 Nova Scotia Department of Health and Wellness (DHW) *Adult Gambling Information Collection Project (AGICP)* was designed to gather general information on gambling participation and identify and assess key factors associated with at-risk and problem gambling among Nova Scotia adults aged 19 years and older. It marks the fifth iteration of systematic information collection on gambling in the province and allows for comparison with data from the 2007 Nova Scotia prevalence study (cf. Nova Scotia Department of Health Promotion and Protection, 2008). This report summarizes the survey findings.

## Methodology

Between March 19, 2013 and June 21, 2013, 5,218 adults aged 19 years and older residing in Nova Scotia were surveyed by telephone and online. Reasonable steps were taken to ensure the protection of the respondents' information, while maintaining the integrity of the statistics. All materials were subject to DHW privacy review, and the survey was conducted in compliance with Nova Scotia provincial privacy requirements.

### Questionnaire Design

The AGICP employed a questionnaire using the self-report method, with content focused on concepts from earlier gambling prevalence studies conducted in Nova Scotia to ensure comparability. Additional questions pertinent to gambling behaviour, VLT gambling at First Nations' venues, substance use, and mental health were added. Questions regarding mental health were based on items from the Canadian Community Health Survey. Secondary data was gathered for Gross Gambling Revenues and revenue allocations for Responsible Gambling and Prevention, Research, and Treatment.

Two focus groups were held to assess the survey for clarity, flow, and language level (minimum grade 8). Participants were selected from a random sample of 300 households based on education level and age, to ensure that the survey questions were understood by a broad audience. All participants were required to sign consent forms. Based on the focus group feedback, revisions were made to the survey before it was finalized.

## Measurement of At-Risk and Problem Gambling

Several assessment tools currently exist to measure at-risk and problem gambling, including the Problem Gambling Severity Index (PGSI), which is a nine-item self-reporting instrument used to identify the severity of gambling disorders in the general population (Ferris & Wynne, 2001).[7] The PGSI is a reliable and valid screening tool used in Canada, and it was employed in the *2003 Nova Scotia Gambling Prevalence Study* (Nova Scotia Department of Health Promotion and Protection, 2003) and the *2007 Nova Scotia Adult Gambling Prevalence Study* (Nova Scotia Department of Health Promotion and Protection, 2008). For comparability, the 2013 AGICP incorporated the Problem Gambling Severity Index (PGSI) to estimate the prevalence of low- to moderate-risk and problem gambling in the adult population of Nova Scotia. Data collected for the 2007 study has been used in this study to identify possible trends over the six-year period. However, whereas the 2007 study combined the moderate-risk and problem gambling PGSI categories for reporting purposes (Nova Scotia Department of Health Promotion and Protection, 2008: 46), the AGICP did not merge the PGSI subsets.[8] This means that comparing the PGSI results of the two reports is methodologically inappropriate. To enable valid comparisons, the 2007 data was reanalyzed using the same categories as in the AGICP, shown below.

| Problem Gambling Severity | |
|---|---|
| **Non-Gamblers** – Individuals who have never gambled<br>Individuals who have not gambled in the previous 12 months | |
| **Non-Problem Gamblers** | PGSI Score 0 |
| **Low-risk Gamblers** | PGSI Score 1 – 2 |
| **Moderate-risk Gamblers** | PGSI Score 3 – 7 |
| **Problem Gamblers** | PGSI Score 8 + |

7 See also Shellinck et al. (2015) *FLAGS* for a gambling harm risk assessment instrument, and Williams and Volberg (2012) *PPGM* for a problem and pathological gambling instrument.

8 The *2007 Nova Scotia Adult Gambling Prevalence Study* scored the PGSI as "Non-Problem" = 0; "At-Risk" = 1–2; and "Problem" = 3+.

## Sampling Design

The sampling methods in this survey are comparable to those used in the 2007 survey. In addition, the sample size was increased from 2,500 to 5,218 people, and some of the sample was redistributed to better reflect shifting population patterns across the health zones. A sampling frame was developed to represent 2011 census data for the total Nova Scotia population aged 19 years and older. The total sample size was calculated based on a desired total margin of error of 1.5%, or less, and 6,000 completed surveys. To ensure information on gambling participation and problem gambling severity was available at NSHA management zone levels, some of the sample was redistributed from the Central Zone so that the maximum margin of error for districts within each zone was 5.0% or less. As a result, a stratified random sample design of households by districts was used, and the results were later weighted by sex and age within each zone.

The initial sampling frame for the AGICP included all residential telephone numbers in Nova Scotia obtained through software from ASDE Inc of Gatineau, Quebec. ASDE gathers lists of names, addresses, and phone numbers (listed, unlisted, and cellular telephone numbers) from telephone companies across Canada and used both Random A and Random B methods. The company used published telephone numbers from directories and the Random B method to generate sample blocks for unlisted cellular phone numbers.[9]

Two weeks prior to the start of data collection, the Nova Scotia Department of Health and Wellness sent introduction letters to a random sample of 12,000 Nova Scotia households. The letters informed the residents that their household had been selected for the AGIC project and that they might be asked to participate. An additional 1,000 random cellular phone numbers were added to the sample to ensure representation from cell-phone-only households.

Household response rates were calculated after interviewers determined the number of members 19 years or older in each household. Following consent, interviewers read a privacy statement in compliance with Nova Scotia's privacy standards. Upon completion of the survey, the interviewers asked each participant whether any questions had provoked negative thoughts or feelings and provided a toll-free number for the Problem Gambling Helpline.

9 Random A samples are samples of random numbers systematically selected with equal probability across all eligible telephone blocks. Random B samples are samples of random numbers distributed across all eligible blocks in proportion to their density of listed telephone households.

After each survey within a household, remaining residents were asked to complete the survey either by telephone or online: 89.7% of the surveys were completed by telephone, and 10.3% were completed online. A total 12,415 phone numbers were contacted, and 5,218 adults completed the survey. The response rate between households selected for the survey was 32.0%, and 68.9% of adults within each participating household completed a survey.

## Interview Procedure

After finalizing the survey, the questionnaire was programmed into a CallWeb form. The programmer checked commands for all survey fields and developed skip commands to ensure that questions were asked as intended and all questions had been answered. Since the questionnaire could be completed online as well as by telephone, the online survey had pop-up descriptors wherever the telephone interviewer would have a note or prompt to provide additional information or an explanation of terminology. The use of CallWeb facilitated effective administration of the survey and allowed tracking of completions by all identified strata of interest. CallWeb was also programmed with quotas by district and online surveys (no greater than 30%) by district.

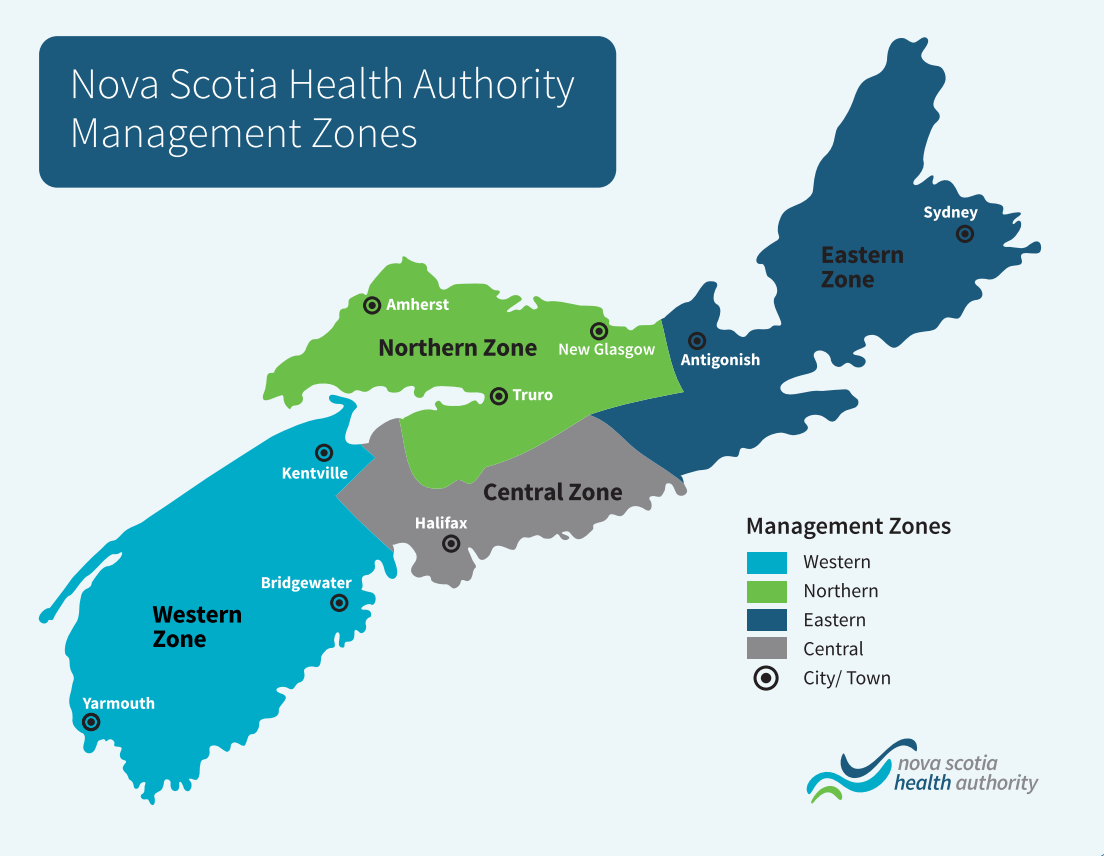
Once the CallWeb form was created, it was tested extensively to ensure it was an accurate representation of the final questionnaire. Checks were programmed into CallWeb to ensure that respondents were asked to clarify their responses, should any errors in logic occur in their answers. All questions were checked to ensure no out-of-range values. These outliers were flagged by surveyors for supervisor follow-up to ensure the validity of responses.

## Statistical Analysis

Sampling focused on ensuring a margin of error of 5.0% for each health zone, which led to underrepresentation of some groups. Therefore, a weighting scheme was generated for age, sex, and zone to reflect provincial population characteristics. Descriptive statistics were calculated for each measure, and similarities or differences between categories were tested for statistical significance with unweighted data using t-tests and analysis of variance (ANOVA) for mean comparisons, Chi-Square and Fisher Exact tests, and z-tests for proportions (adjusted for small sample sizes where appropriate) with the probability level set at $p<.05$. Statistical significance indicates that a specific result did not occur through random variation or chance and that the estimated result would be found in the population 95% of the time, or $p<.05$.

Health zones were used to allow for comparability to previous surveys in which they had been used. These zones include the Western Health Zone (Districts 1, 2, and 3), Northern Health Zone (Districts 4, 5, and 6), Eastern Health Zone (Districts 7 and 8), and Central Health Zone (District 9).[10]

All analyses were conducted using either the Stata 11.2 computer program[11] or SPSS Version 21.[12]




10 During data collection, the health authorities were organized into nine districts. However, the districts were amalgamated into four zones in 2015 (Western, Northern, Eastern, and Central).

11 StataCorp. Stata Statistical Software: Release 11.2. College Station, TX: StataCorp LP.

12 IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.

## Design Consideration and Limitations

The data collected for the AGICP is based on uncorroborated self-reports, and questions regarding problematic gambling behaviour and substance use are sensitive in nature. In addition, respondents within each household completed the survey by landline, cellular phone, or online; it is unknown whether the particular method employed affected reporting. Approximately 10% of the surveys were completed online. Humphreys et al. (2009) provide evidence that respondents to an online gambling survey differed by demographics and reported higher participation in gambling; they did not examine responses to sensitive questions, such as those of the PGSI. The manner of data collection did not allow for analysis of differences between the online and telephone samples. A systematic bias could also have occurred through the sampling procedures. Although households were randomly selected, not all adults within the household completed the survey, a fact which could bias the results. Response rates were tracked by former district to address regional information needs, and this led to underrepresentation by sex, age, and health zone. To adjust for this, the sample was proportionately weighted by these demographics following data collection, but not for response rates or method of data collection. Weighting may itself introduce bias, since underrepresented populations may not have the same characteristics as respondents in the sample.

# Demographic Characteristics of the 2013 Sample

As shown in Table 1, the collected data overrepresented women, adults above 55 years of age, and several districts,[13] and proportional weighting was used to align the sample with the population parameters. Following weighting, prevalence estimates of the Problem Gambling Severity Index (PGSI) indicated variations by demographics for each risk category within ±0.1%. Additional comparisons of the remaining variables between unweighted and weighted data produced similar results.

**TABLE 1** • Characteristics of the 2013 Adult Gambling Information Collection Project Sample

| | | Population 19+ Years | Population% | Unweighted% N=5218 | Weighted% N=5235 |
|---|---|---|---|---|---|
| **Province** | Total | 738,150 | 100.0 | 100.0 | 100.0 |
| **Sex** | Male | 351,695 | 47.7 | 41.8 | 47.5 |
| | Female | 386,455 | 52.3 | 58.2 | 52.5 |
| **Age** | 19-24 | 71,705 | 9.7 | 2.9 | 9.1 |
| | 25-34 | 103,460 | 14.0 | 5.0 | 13.9 |
| | 35-44 | 118,495 | 16.1 | 10.7 | 16.1 |
| | 45-54 | 153,735 | 20.8 | 20.8 | 21.1 |
| | 55-64 | 137,385 | 18.6 | 27.7 | 19.0 |
| | 65+ | 153,370 | 20.8 | 32.9 | 20.9 |
| **District**[14] | 1 - South Shore | 47,910 | 6.5 | 7.3 | 6.6 |
| | 2 - South West | 46,507 | 6.3 | 7.4 | 6.5 |
| | 3 - Annapolis Valley | 64,605 | 8.8 | 10.0 | 8.9 |
| | 4 - Colchester East Hants | 56,945 | 7.7 | 7.6 | 7.8 |
| | 5 - Cumberland | 25,315 | 3.5 | 7.2 | 3.5 |
| | 6 - Pictou | 36,245 | 4.9 | 7.2 | 5.1 |
| | 7 - Guysborough - Antigonish | 32,223 | 4.4 | 7.2 | 4.5 |
| | 8 - Cape Breton | 95,525 | 12.9 | 13.0 | 13.0 |
| | 9 - Capital | 332,875 | 45.1 | 33.2 | 44.2 |

*Source: 2011 Canadian Census Data, Statistics Canada*

13 During data collection, the health authorities were organized into nine districts. However, the districts were amalgamated into four zones in 2015 (Central, Western, Northern, and Eastern).

## General Demographic Information

Statistics Canada population figures for Nova Scotia allow for an estimate of approximately 738,000 adults aged 19 years and older who resided in roughly 390,000 households in 2013. The primary language both acquired at birth and spoken in the home was English (94%), followed by French (2.8%), with 0.3% bilingual in both official languages, and 2.6% having first learned and spoken languages other than English or French in the home.

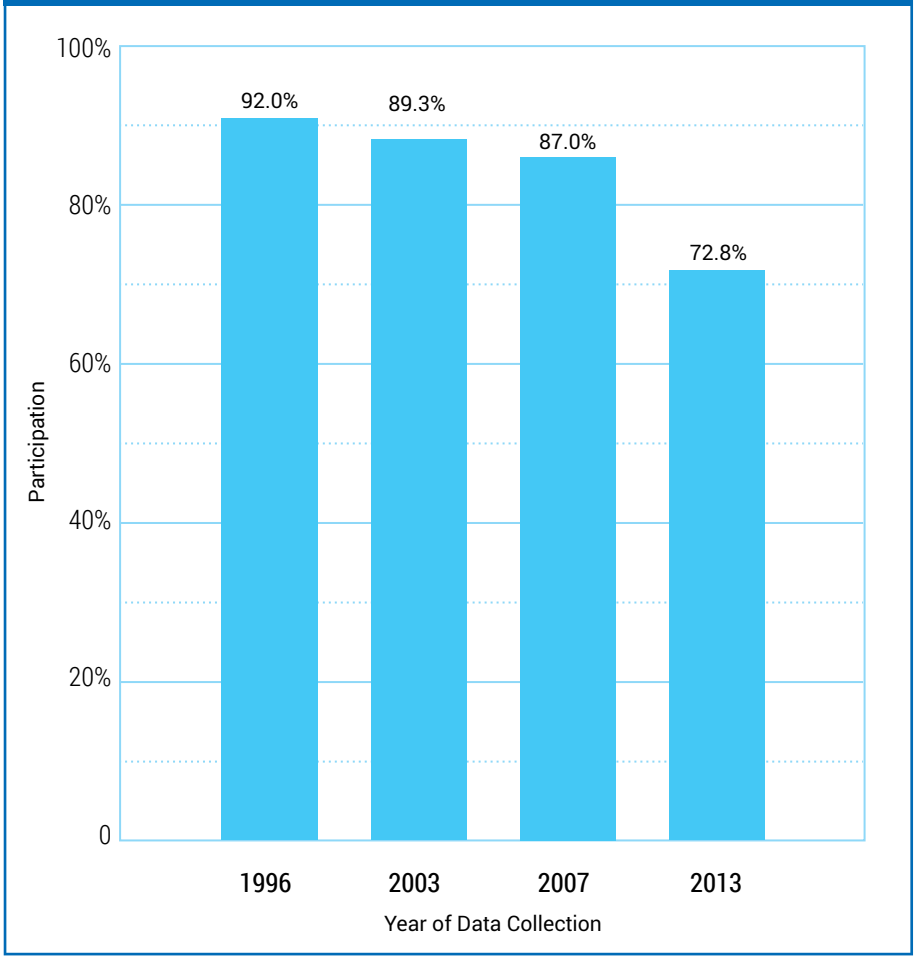
In the sample, 84.5% self-identified as from European descent, 3.7% from aboriginal descent[14], 1.9% from Asian descent, 0.8% from African descent, and 9.1% from other population backgrounds. Approximately two-thirds (67.1%) of respondents provided a marital status of married or living common-law, 21.1% were single, 6.7% were separated or divorced, and 5% were widowed. Place of residence was almost equally divided between urban centres and rural communities of less than 10,000 persons (48.9% versus 51.1%). Fifty-nine per cent of respondents were employed (61.8% of men and 56.4% of women). Of the 86% of respondents who reported annual household income, 14.3% stated their household income was below $30,000, 24.9% earned between $30,001 and $59,999, and 58.5% reported a household income above $60,000.

14 Statistics Canada no longer defines population groups under headings of 'race' or 'ethnicity' and provides initial categories of aboriginal and non-aboriginal. Aboriginal peoples are further categorized into distinctive groups: First Nations peoples living in and outside of First Nations Communities, Mètis, and Inuit (see <http://www.statcan.gc.ca/concepts/definitions/ethnicity-ethnicite-eng.htm>). Aboriginal respondents in this study self-identified as having aboriginal ancestry, and it is unknown what proportion are First Nations (Mi'kmaq), Mètis, or Inuit.

# Gambling Participation in Nova Scotia

As shown in Figure 1, past-year gambling participation among adults in Nova Scotia has declined continuously since 1996 and fell from 87.0% in 2007 to 72.8% in 2013, with approximately 538,000 of adults in Nova Scotia participating in a minimum one form of gambling in the previous year.

**FIGURE 1** • Past-year gambling participation among adults 19+ / 1996 to 2013




*Sources: (Nova Scotia Department of Health Promotion and Protection 2008: 70); 2013 Adult Gambling Information Collection Project.*

## Gambling Participation by Demographic and Geographic Characteristics

Table 2 provides indicators of overall gambling participation by demographic and geographic categories. With the exception of sex, statistical *associations* were observed for each demographic and geographic category.[15] That is, each is correlated with past-year gambling, and we can conclude with 95% confidence that the association did not occur by chance.[16] It is also important to note that demographic and/or geographic categories can be interrelated. For example, while there is no statistically significant difference between men and women in overall gambling participation, a person's sex *combined with* age affects whether they had gambled in the past year. Similar outcomes exist within some of the other categories.

**Sex –** There were no statistically significant differences for past-year gambling solely by the respondent's sex. However, when the category sex is combined with age, more men than women below the age of 35 had engaged in past-year gambling of some type (75% versus 66%, $p<.05$). Participation was equal among men and women above this age.

**Age –** Seniors (65 years and older) and adults below 25 years of age were less likely to have gambled in the previous year than adults of other age groups. However, gambling participation declines significantly at approximately 80 years of age. Fifty-three per cent of those above age 80 had gambled in the past-year, compared with 68.2% of the 65 to 79 age category and 74.8% below 65 ($p<.05$). When respondents 80 years of age are removed from the analysis, the 65 to 79 age group were equally as likely as those age 19 to 24 to have engaged in some form of gambling in the past-year ($p<.05$).

**Population Group –** Respondents of Asian descent were least likely to have partaken in any form of gambling, with the exception of casino table games. In addition, respondents of European descent had slightly higher participation than the combined group of non-European ancestry (73.2% versus 68.1%, $p<.05$).

**NSHA Management Zone –** The Eastern Zone had the highest reported rate of gambling in 2013. This zone has one of the two casinos in the province, and although that casino has fewer slot machines, the Eastern Zone has the highest per capita number of VLTs. Slightly higher involvement with electronic gambling machines was noted for this zone than for the other three.

15 As indicated by the *Chi-Square* statistic.

16 Statistical associations in table results or correlations do not show causality, and the analysis presented does not imply causality.

**TABLE 2** • Gambling Participation by Sex, Age, Population Group, Health Zone, Household Income, Education, and Marital Status / 2013

| Category | | N = 5235 | Participation % |
|---|---|---|---|
| **Sex** | Male | 2489 | 73.4 |
| | Female | 2746 | 72.1 |
| **Age** | 19-24 | 475 | **69.1** |
| | 25-34 | 727 | 72.2 |
| | 35-44 | 841 | 75.7 |
| | 45-54 | 1106 | 78.8 |
| | 55-64 | 994 | 74.1 |
| | 65+ | 1092 | **65.2** |
| **Population Group** | European | 4423 | 73.5 |
| | Aboriginal | 196 | 76.0 |
| | Asian | 99 | **57.6** |
| | African Nova Scotian | 40 | 67.5 |
| | Other | 477 | 68.1 |
| **Health Zone** | Central | 2311 | 72.0 |
| | Western | 917 | 68.5 |
| | Northern | 856 | 74.6 |
| | Eastern | 1151 | **78.2** |
| **Household Income** | < $30,000 | 743 | 63.0 |
| | $30,001 - $59,999 | 1113 | 72.3 |
| | $60,000+ | 2619 | **78.6** |
| | Not Reported | 760 | 62.9 |
| **Education** | < Grade 12 | 682 | 71.3 |
| | High School | 854 | 71.9 |
| | Some University/College | 643 | 75.1 |
| | Complete University/College | 317 | 75.9 |
| | Post Graduate | 739 | **63.4** |
| **Marital Status** | Single | 1103 | 69.2 |
| | Married – Common Law | 3519 | **74.7** |
| | Separated – Divorced | 349 | 72.7 |
| | Widowed | 266 | **63.0** |

**Bold text** *indicates a statistically significant difference among the group categories p < .05.*
**Compare between rows.**

**Income & Education –** People with a household income above $60,000 reported higher participation in past-year gambling; yet those with a post-graduate education were notably less likely to have taken part. Combining income and education specifies the association. Participation was highest when there was congruence between income and education, and lowest when levels of income and education did not match. Respondents with a household income of less than $30,000 and less than high school education were ten times more likely to report gambling involvement than those in the lowest income category with a post-graduate degree (32% versus 3.2%, $p<.05$). Conversely, 68% of post-graduates with an income of $60,000+ had gambled in the past year, compared with 23% of individuals with less than high school education and an income above $60,000 ($p<.05$).

**Marital Status –** A status of married or living common law was associated with higher gambling involvement, and being widowed with lower gambling. Nevertheless, the probability of being widowed increases with age, which may influence participation: 52% above 80 years of age who were widowed had gambled in the previous year, compared with 78% below 65 who were widowed ($p<.05$).

## Participation in Gambling Activities

Tables 3A and 3B display rates of participation in specific gambling activities across demographics and geographic groupings. The bottom line of the table shows that in 2013 Nova Scotians engaged most frequently in weekly lotteries (46.9%), such as Lotto 649 or Lotto Max, and charity raffles (46.1%), such as 50/50 draws or hospital lotteries. Just over 24% had purchased a scratch-n-win/breakopen ticket in the previous year. Although variation exists among bingo, VLTs, and casino games, there were no statistically significant differences between these activities. Horse racing and Internet gambling were the least reported activities.

Among those who gambled on electronic gambling machines (slot machines and VLTs), 55.2% of VLT players had not played slot machines, and 66.2% of slot players had not engaged in VLT play. VLTs are dispersed throughout the province, and slot machine play was slightly higher by regional proximity to the casinos in Halifax and Sydney. This finding suggests that these types of gambling tend to attract different groups of people and should be explored in subsequent studies, particularly since VLT play has a stronger association with at-risk and problem gambling than other gambling activities in Nova Scotia.

**TABLE 3A • Gambling Participation by Sex, Age, Population Group, and Health Zone / 2013**

| Categories | | | Gambling Activities (results are %) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Daily lottery | Weekly lottery | Scratch–Breakopen | Charity raffles | Bingo | Horse racing | VLTs | Casino slots | Casino table games | Internet gambling ALC | Internet gambling other |
| **Sex** | Male | 2489 | **6.1** | **51.5** | 21.9 | 43.9 | 3.7 | **1.3** | **7.4** | 7.4 | **6.7** | 0.9 | **1.6** |
| | Female | 2746 | 4.7 | 42.8 | **26.2** | **48.0** | **9.4** | 0.2 | 4.1 | 7.4 | 1.5 | 0.8 | 0.4 |
| **Age** | 19-24 | 475 | 6.5 | 19.4 | **37.7** | 32.0 | 10.1 | 1.7 | **12.8** | **12.8** | **14.3** | 0.8 | 0.6 |
| | 25-34 | 727 | 5.9 | 38.5 | 24.9 | 42.1 | 8.0 | 0.6 | 6.2 | 7.4 | 7.2 | 0.0 | 1.5 |
| | 35-44 | 841 | **7.2** | 47.9 | 22.4 | **56.8** | 8.2 | 0.8 | 6.3 | 6.9 | 5.2 | 1.4 | 1.4 |
| | 45-54 | 1106 | 5.1 | **57.9** | 23.3 | 52.5 | 6.1 | 0.5 | 4.8 | 7.2 | 2.3 | 1.3 | 1.0 |
| | 55-64 | 994 | 4.3 | **55.3** | 19.4 | 47.5 | 5.4 | 0.6 | 4.5 | 6.8 | 1.3 | 1.0 | 0.8 |
| | 65+ | 1092 | 4.2 | 45.1 | 17.7 | 38.7 | 4.9 | 0.8 | 3.7 | 6.0 | 0.6 | 0.5 | 0.6 |
| **Population Group** | European | 4423 | 5.2 | 47.4 | 22.9 | **47.7** | 5.9 | 0.7 | 5.3 | 7.6 | 3.8 | 0.8 | 0.9 |
| | Aboriginal | 196 | **9.7** | 49.0 | **43.4** | 40.8 | **13.8** | 0.0 | **11.7** | 7.7 | **8.2** | 1.0 | 2.6 |
| | Asian | 99 | 6.0 | **30.0** | 12.0 | 36.0 | 4.0 | 0.0 | 6.0 | 5.1 | **10.1** | 0.5 | 0.0 |
| | African Nova Scotian | 40 | **20.0** | 60.0 | **37.5** | **45.0** | **17.5** | 0.0 | **17.5** | 10.0 | 7.5 | 1.0 | 2.5 |
| | Other | 477 | 4.0 | 44.1 | 29.0 | 35.6 | 11.1 | 1.5 | 5.7 | 5.7 | 2.5 | 0.8 | 1.3 |
| **Health Zone** | Central | 2311 | 4.8 | 43.7 | 23.6 | 46.1 | 6.7 | 0.7 | 5.3 | **8.1** | 5.1 | 0.9 | 0.7 |
| | Western | 917 | 4.7 | 44.5 | 25.2 | **37.4** | 6.8 | 0.2 | **3.0** | **4.5** | **1.0** | 0.8 | 0.9 |
| | Northern | 856 | 6.2 | 48.6 | 25.8 | 48.0 | 6.9 | 0.7 | 7.1 | 6.8 | 3.5 | 1.3 | 2.1 |
| | Eastern | 1151 | 6.9 | **56.6** | 23.4 | **55.2** | 6.5 | 1.6 | **8.3** | **9.6** | 5.0 | 0.2 | 0.9 |
| **Totals** ** | | **N = 5235** | 5.4 | 46.9 | 24.2 | 46.1 | 6.7 | 0.7 | 5.7 | 7.4 | 4.0 | 0.8 | 1.0 |

**Bold text** *indicates a statistically significant difference among the group categories p < .05.*
**Compare between rows.**

**TABLE 3B** • Gambling Participation by Household Income, Education, and Marital Status / 2013

| Categories | | | Gambling Activities (results are %) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Daily lottery | Weekly lottery | Scratch–Breakopen | Charity raffles | Bingo | Horse racing | VLTs | Casino slots | Casino table games | Internet gambling ALC | Internet gambling other |
| **Household Income** | < $30,000 | 743 | 6.7 | 40.1 | 24.9 | 28.2 | 8.1 | 0.3 | 4.2 | 4.3 | 2.0 | 0.4 | 1.2 |
| | $30,001 - $59,999 | 1113 | 6.2 | **49.3** | **27.2** | **41.6** | 6.5 | 0.9 | **7.6** | **7.3** | 2.3 | 0.8 | 0.8 |
| | $60,000+ | 2619 | 4.5 | **50.3** | 23.5 | **55.8** | 6.3 | 0.9 | 5.6 | **8.8** | **5.5** | 0.9 | 1.0 |
| | Not Reported | 760 | 5.6 | 38.5 | 21.2 | 36.6 | 7.1 | 0.5 | 4.3 | 5.7 | 3.2 | 1.2 | 0.9 |
| **Education** | < Grade 12 | 682 | 5.9 | 50.9 | 28.2 | 30.7 | 8.8 | 0.4 | 7.8 | 5.7 | 1.8 | 0.4 | 1.5 |
| | High School | 854 | 7.2 | 49.2 | 27.5 | 41.4 | 9.3 | 0.7 | 7.3 | 6.2 | 1.8 | 0.5 | 1.1 |
| | Some University/College | 643 | 4.8 | 45.9 | 25.3 | 45.6 | 8.1 | 2.0 | 6.7 | 12.0 | **7.6** | 0.9 | **2.2** |
| | Complete University /College | 2317 | 5.5 | 49.4 | 26.2 | 52.1 | 6.0 | 0.4 | 5.2 | 7.8 | **4.4** | 1.0 | 0.6 |
| | Post Graduate | 739 | **2.7** | **33.9** | **9.3** | 47.3 | **2.7** | 1.1 | **2.3** | 5.1 | **4.3** | 0.8 | 0.5 |
| **Marital Status** | Single | 1103 | **8.9** | 35.6 | **30.8** | 36.9 | 8.3 | 1.4 | **9.6** | **9.5** | **9.5** | 0.7 | 1.7 |
| | Married – Common Law | 3519 | 4.2 | **50.7** | 22.4 | **50.0** | 6.1 | 0.6 | 4.4 | 6.7 | 2.6 | 0.9 | 0.9 |
| | Separated – Divorced | 349 | 6.3 | **49.3** | 24.4 | **43.4** | 6.3 | 0.6 | **7.2** | 7.2 | 2.9 | 1.1 | 0.3 |
| | Widowed | 266 | 4.6 | 42.0 | 20.2 | 37.0 | 7.6 | 0.4 | 3.8 | **8.4** | 0.4 | 0.4 | 0.4 |
| **Totals** ** | | **N = 5235** | 5.4 | 46.9 | 24.2 | 46.1 | 6.7 | 0.7 | 5.7 | 7.4 | 4.0 | 0.8 | 1.0 |

**Bold text** *indicates a statistically significant difference among the group categories p < .05.*
**Compare between rows.**

**Sex –** With regard to sex and gambling participation by activity, men reported more involvement with lotteries, horse-race wagering, VLTs, casino table games, and Internet gambling than women. In turn, women engaged more in scratch-n-win/breakopen tickets, charity raffles, and bingo. No statistical difference was found by sex for casino slots.

**Age –** Respondents aged 19–24 were most likely to have purchased scratch-n-win/breakopen tickets, and gambled on VLTs, casino slots, and at casino table games. Those 35–44 took part in daily lotteries and charity raffles, and the 45–64 age group also reported participation in weekly lotteries.

**Population Group –** Self-identified African Nova Scotian respondents were more predisposed to have participated in daily lotteries and charity raffles. African Nova Scotian and self-identified aboriginal respondents also engaged more often with scratch-n-win/breakopen tickets, bingo, and VLTs than those of other population groups. Among all of the groups, those with Asian and aboriginal descent engaged most often in casino table games, and those of European descent had the highest involvement with charity raffles.

**NSHA Management Zone –** Respondents from the Eastern Zone dominated participation in weekly lotteries, charity raffles, and VLTs. Slot machine gambling was also marginally higher among respondents in the Eastern Health Zone, even though the casino in the Eastern Zone has roughly 40% fewer slot machines than that in the Central Zone, and the latter has a larger catchment area. The Eastern Zone also has the highest per capita number of VLTs (60 per 10,000), twice that of the Central Zone (30 per 10,000). Respondents from the Western Zone were less likely to have purchased charity raffle tickets and gambled on casino slots, casino table games, or VLTs. Nova Scotians who live in the Western Zone do not have easy access to the Halifax casino and have the third-lowest per capita number of VLTs distributed across the Western Zone (34 per 10,000). Residents within the Northern Health Zone are more predisposed to play on VLTs than residents of the Western and Central Zones, which may be due to their proximity to the second-highest per capita number of VLTs (42 per 10,000).

**Household Income –** Participation in weekly lotteries, charity raffles, and casino slots increased by level of income, with gambling on scratch-n-win/breakopen tickets and VLTs highest among the $30,001–$59,999 income group. Those in the highest income category were most likely to engage in casino table games. No statistically significant differences were found with daily lotteries or bingo, which suggests that interest in these activities encompasses all income categories.

**Education –** In terms of education, few statistically significant differences were found for each activity. Respondents with post-graduate education were least likely to have purchased lottery or scratch-n-win/breakopen tickets and to have gambled on bingo or VLTs. Those with a minimum of some college or university engaged in casino table games more than individuals with a high school diploma or less than a grade 12 level of education.

**Marital Status –** Those who are single had the highest involvement with daily lotteries, scratch-n-win/breakopen tickets, VLTs, and casino table games and were equally inclined as those widowed to have gambled on casino slot machines. Approximately half of married, separated, or divorced respondents had participated in weekly lotteries and charity raffles. Those separated or divorced were equally inclined as single respondents to have gambled on VLTs.

# Comparison of Gambling Participation: 2007 and 2013

As shown in Table 4, gambling participation among the adult population of Nova Scotia has decreased significantly across all the demographic and geographic characteristics measured in the AGICP.

**TABLE 4** • Gambling Participation by Sex, Age, Health Zone, Household Income, Education, and Marital Status / 2007 versus 2013

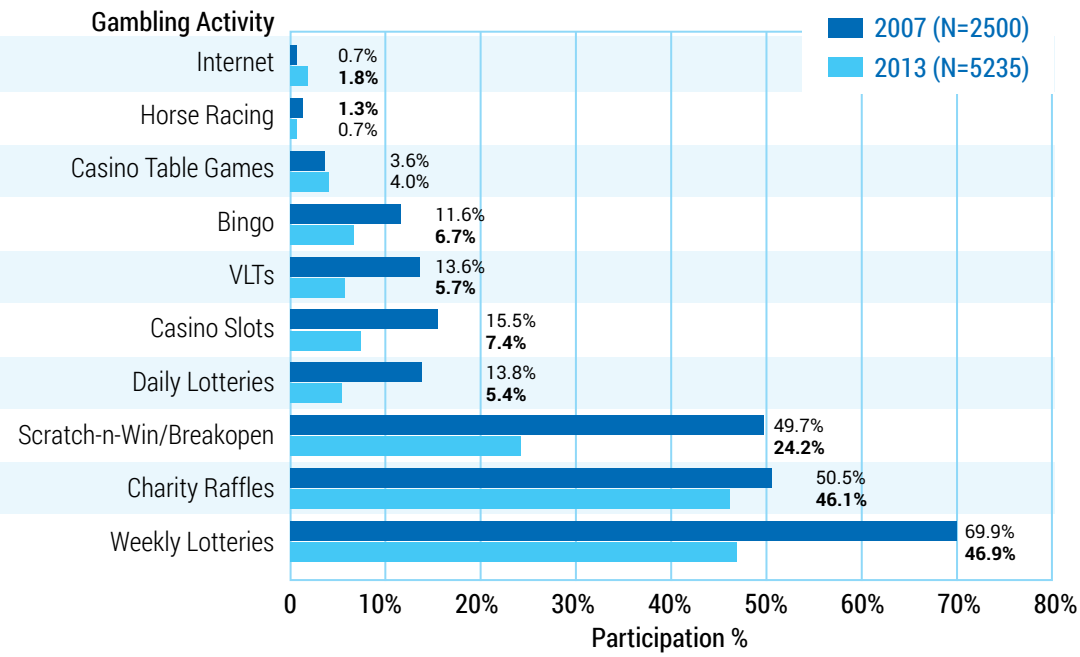
| Category | | 2007 | | 2013 | |
|---|---|---|---|---|---|
| | | N=2500 | % | N =5235 | % |
| **Sex** | Male | 1165 | 86.9 | 2489 | **73.4** |
| | Female | 1335 | 87.0 | 2746 | **72.1** |
| **Age** | 19-24 | 141 | 89.4 | 475 | **69.1** |
| | 25-34 | 289 | 91.0 | 727 | **72.2** |
| | 35-44 | 520 | 91.9 | 841 | **75.7** |
| | 45-54 | 588 | 91.7 | 1106 | **78.8** |
| | 55-64 | 469 | 84.9 | 994 | **74.1** |
| | 65+ | 493 | 75.1 | 1092 | **65.2** |
| **Health Zone** | Central | 968 | 88.9 | 2311 | **72.0** |
| | Western | 576 | 81.3 | 917 | **68.5** |
| | Northern | 538 | 85.7 | 856 | **74.6** |
| | Eastern | 418 | 91.9 | 1151 | **78.2** |
| **Household Income** | < $30,000 | 389 | 83.0 | 743 | **63.0** |
| | $30,001 - $59,999 | 693 | 89.3 | 1113 | **72.3** |
| | $60,000+ | 861 | 92.6 | 2619 | **78.6** |
| | Not Reported | 557 | 78.1 | 760 | **62.9** |
| **Education** | < Grade 12 | 603 | 79.1 | 682 | **71.3** |
| | High School | 483 | 89.9 | 854 | **71.9** |
| | Some University / College | 268 | 88.4 | 643 | **75.1** |
| | Complete University / College | 984 | 90.5 | 2317 | **75.9** |
| | Post Graduate | 161 | 83.2 | 739 | **63.4** |
| **Marital Status** | Single | 397 | 86.9 | 1103 | **69.2** |
| | Married - Common Law | 1756 | 87.9 | 3519 | **74.7** |
| | Separated - Divorced | 148 | 87.8 | 349 | **72.7** |
| | Widowed | 197 | 78.2 | 266 | **63.0** |

**Bold text** *Indicates a statistically significant difference between 2007 and 2013 p < .05*
**Compare across columns.**

Patterns of participation have shifted since 2007, with major changes by age, education, and marital status (p<.05). The largest decreases in gambling were among adults 19–34 years of age, those who reported a household income of less than $30,000, and those with a high school education or less or with a post-graduate education (≈20% decline, p<.05). The largest decrease by age was among 19- to 24-year-olds (-20.3%), and the decrease fell by age category, with those 65+ showing the smallest reduction in participation (-9.9%). Additionally, the Eastern and Central Health Zones had approximately equal proportions of gamblers in 2007, but participation in the Central Health Zone had dropped by almost 17% by 2013 (p<.05).[17]

As shown in Figure 2, participation in most gambling activities has also decreased, with sizeable reductions in lottery and scratch-n-win/breakopen ticket purchases and in bingo, VLT, and casino slot gambling. The largest reductions in participation were found with daily lotteries (-60.8%), VLTs (-58.1%), casino slot machines (-52.3%), and scratch-n-win/breakopen tickets (-50.7%). Although it appears that participation in casino table gambling has increased, *the finding is not statistically significant*. That is, there is no way of knowing whether or not the increases between 2007 and 2013 occurred from random variation, and these changes may or may not be real.

**FIGURE 2** • Past-Year Participation in Gambling Activities / 2007 versus 2013




**Bold text** *indicates a statistically significant difference between 2007 & 2013 at p < .05.*

17 Percentage change calculated by ((y2-y1)/y1)*100.

## Reported Monthly Frequency of Gambling Activities

The average number of times Nova Scotians participated in specific gambling activities each month is displayed in Table 6. It should be noted that *the results are solely for gamblers who participated monthly in an activity*, which is why the rates of participation are lower than that for the general population.

Substantially fewer Nova Scotians participated in Internet gambling, and those who wagered on sites other than the Atlantic Lottery websites reported higher monthly engagement. Monthly participation was lowest for charity raffles, casino slots, and casino table games.

**TABLE 5** • Average Monthly Participation by Gambling Activity / 2013

| Activity N = 3811 | Monthly Participation % | Mean | Standard Deviation |
|---|---|---|---|
| Daily lottery | 3.9 | 4.6 | 6.7 |
| Weekly lottery | 37.8 | *3.5* | 3.4 |
| Scratch-n-win/Breakopen | 15.7 | *3.5* | 6.3 |
| Charity raffles | 24.2 | **1.9** | 1.7 |
| Bingo | 4.1 | 2.7 | 2.8 |
| Horse racing | 0.4 | 4.0 | 0.1 |
| VLTs | 3.1 | *3.2* | 3.9 |
| Casino Slots | 2.5 | **1.5** | 1.1 |
| Casino Table Games | 1.3 | **1.7** | 1.5 |
| Internet Atlantic Lottery Corporation | 0.3 | 2.4 | 0.2 |
| Internet Other Sites | 0.7 | 7.9 | 1.3 |

**Bold text** *indicates a statistically significant difference among the group categories at p<.05*
**Compare between rows.**

### Reported Monthly Expenditure on Gambling

Asking people about gambling expenditures can be sensitive, and recall may not be accurate; for this reason, estimates of self-reported expenditures should be regarded with prudence.

Reported mean monthly expenditures among gamblers in 2013 was $33 (standard deviation=$142). Table 6 shows differences by sex, age, population group, health zone, household income, education, and marital status. Men reported mean expenditures approximately 65% higher than those of women, and respondents aged 19–24 spent about 70% more than their older counterparts. Aboriginal gamblers outspent the other population groups by a margin of five to one. Although the mean expenditure among aboriginal gamblers dropped substantially when outliers were removed (≈$50), it remained statistically higher than for non-aboriginal gamblers. Those with less than high school education reported expenditures almost three times above the average of those belonging to the other education categories, and single, separated, or divorced individuals spent approximately 60% more than those who were married or widowed at the time of the survey.

**TABLE 6** • Average Monthly Gambling Expenditure by Demographics / 2013

| Category | | | $ Mean Average | $ Standard Deviation |
|---|---|---|---|---|
| | | N=3811 | 33 | 142 |
| **Sex** | Male | 1828 | **43** | 196 |
| | Female | 1983 | 24 | 84 |
| **Age** | 19-24 | 328 | **68** | 350 |
| | 25-34 | 525 | 23 | 58 |
| | 35-44 | 638 | 26 | 47 |
| | 45-54 | 872 | 35 | 156 |
| | 55-64 | 736 | 28 | 72 |
| | 65+ | 712 | 34 | 109 |
| **Population Group** | European | 3240 | 27 | 76 |
| | Aboriginal | 148 | **158** | 596 |
| | Asian | 58 | 38 | 52 |
| | African Nova Scotian | 40 | 25 | 57 |
| | Other | 325 | 36 | 95 |
| **Health Zone** | Central | 1668 | 37 | 173 |
| | Western | 788 | 27 | 150 |
| | Northern | 638 | 27 | 76 |
| | Eastern | 717 | 36 | 88 |

| | | | | |
|---|---|---|---|---|
| **Household Income** | < $30,000 | 468 | 35 | 113 |
| | $30,001 - $59,999 | 807 | 32 | 84 |
| | $60,000+ | 2059 | 35 | 176 |
| | Income Not Given | 477 | 23 | 51 |
| **Education** | < Grade 12 | 486 | **76** | 351 |
| | High School | 615 | 35 | 65 |
| | Some University/College | 484 | 28 | 63 |
| | Complete University/College | 1758 | 25 | 69 |
| | Post Graduate | 468 | 21 | 82 |
| **Marital Status** | Single | 765 | **54** | 239 |
| | Married – Common Law | 2626 | 25 | 60 |
| | Separated – Divorced | 255 | **51** | 281 |
| | Widowed | 165 | 40 | 136 |

**Bold text** *indicates a statistically significant difference among the group categories p < .05.*
**Compare between rows.**

# At-Risk and Problem Gambling in Nova Scotia, 2013

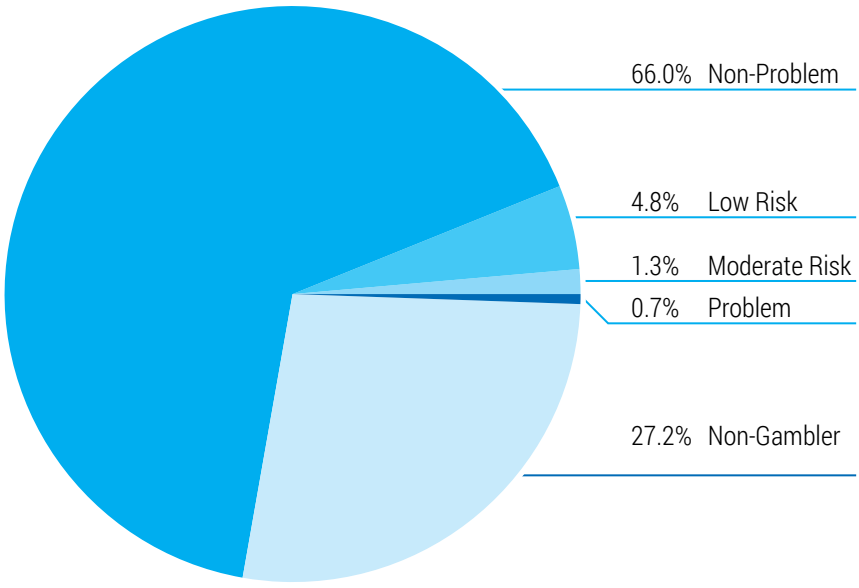
## Prevalence of Low- to Moderate-risk and Problem Gambling: Total Population

The Problem Gambling Severity Index (PGSI) revealed that 6.8% of the sample were at some level of risk (Figure 3), which is not statistically different from the 6.1% reported in 2007. More precisely, 4.8% were at low risk, 1.3% at moderate risk, and 0.7% were classified as problem gamblers. Accordingly, it can be estimated with 99% confidence that in 2013

- 29,900 to 41,000 Nova Scotians were at low risk (4.8% ± 0.7%)
- 6,600 to 12,500 Nova Scotians were at moderate risk (1.3% ± 0.4%)
- 3,000 to 7,400 Nova Scotians were problem gamblers (0.7% ± 0.3%)

That is, a total of 39,500 to 60,900 Nova Scotians were classified at risk for harm from their gambling.

**FIGURE 3** • Non-Gambler, Non-Problem, Low- to Moderate-risk and Problem Gamblers / Total sample 2013



As with gambling participation, differences in at-risk and problem gambling in the population exist by demographic and geographic groups (Table 7A and B).

**TABLE 7A** • PGSI Scores by Sex, Age, Population Group, Health Zone / Total Sample 2013

| Category | | N=5235 | Non Gambler % 27.2 | Non-Problem % 66.0 | Low-risk % 4.9 | Moderate-risk % 1.3 | Problem % 0.7 |
|---|---|---|---|---|---|---|---|
| **Sex** | Male | 2489 | 26.6 | 64.7 | **6.1** | 1.6 | **1.0** |
| | Female | 2746 | 27.8 | 67.1 | 3.7 | 1.1 | 0.3 |
| **Age** | 19-24 | 475 | **30.9** | **56.2** | **11.2** | 0.8 | 0.8 |
| | 25-34 | 727 | 27.8 | 65.7 | 4.5 | 1.0 | 1.0 |
| | 35-44 | 841 | 24.2 | 68.8 | 5.3 | 1.4 | 0.2 |
| | 45-54 | 1106 | 21.3 | 71.7 | 4.4 | 1.4 | 1.1 |
| | 55-64 | 994 | 25.8 | 68.3 | 3.5 | 1.9 | 0.5 |
| | 65+ | 1092 | **34.6** | **60.1** | 3.6 | 1.2 | 0.5 |
| **Population Group** | European | 4423 | 26.5 | **67.5** | 4.5 | 1.0 | 0.5 |
| | Aboriginal | 196 | 24.1 | 59.5 | **12.3** | 0.5 | **3.6** |
| | Asian | 99 | **42.0** | 43.0 | **9.0** | **6.0** | 0.0 |
| | African Nova Scotian | 40 | **32.5** | 57.5 | 5.0 | **5.0** | 0.0 |
| | Other | 477 | **31.7** | 59.4 | 4.2 | 3.4 | 1.3 |
| **Health Zone** | Central | 2311 | 27.9 | 66.1 | 3.8 | 1.3 | 0.9 |
| | Western | 917 | **31.6** | 62.8 | 4.2 | 1.1 | 0.3 |
| | Northern | 856 | 25.4 | 67.6 | 5.6 | 1.1 | 0.4 |
| | Eastern | 1151 | 21.8 | 68.2 | **7.5** | 1.7 | 0.8 |

**Bold text** *indicates a statistically significant difference by PGSI category and demographic category at p < .05.*
**Compare between rows.**

**TABLE 7B** • PGSI Scores by Household Income, Education and Marital Status / Total Sample 2013

| Category | | | Non Gambler % | Non-Problem % | Low-risk % | Moderate-risk % | Problem % |
|---|---|---|---|---|---|---|---|
| | | N=5235 | 27.2 | 66.0 | 4.9 | 1.3 | 0.7 |
| **Household Income** | < $30,000 | 743 | **37.0** | **53.2** | 6.6 | **2.7** | 0.5 |
| | $30,001 - $59,999 | 1113 | 27.6 | 64.5 | 4.9 | 1.7 | 1.3 |
| | $60,000+ | 2619 | 21.4 | 72.8 | 4.5 | 0.8 | 0.5 |
| | Not Reported | 760 | **37.2** | **57.2** | 4.1 | 1.2 | 0.4 |
| **Education** | < Grade 12 | 682 | 28.6 | **60.6** | **7.3** | **2.3** | **1.2** |
| | High School | 854 | 28.0 | 62.4 | **6.2** | 1.8 | **1.6** |
| | Some University/ College | 643 | 24.8 | 68.7 | 4.8 | 1.4 | 0.3 |
| | Complete University/ College | 2317 | 24.2 | 69.9 | 4.3 | 1.3 | 0.3 |
| | Post Graduate | 739 | **36.7** | **60.5** | 2.4 | 0.1 | 0.3 |
| **Marital Status** | Single | 1103 | 30.7 | **57.8** | **8.1** | 1.8 | **1.6** |
| | Married – Common Law | 3519 | 25.3 | 69.4 | 3.8 | 1.1 | 0.4 |
| | Separated – Divorced | 349 | 27.3 | 64.6 | **5.2** | 2.0 | 0.9 |
| | Widowed | 266 | **37.0** | **57.3** | 4.2 | 1.5 | 0.0 |

**Bold text** *indicates a statistically significant difference by PGSI category and demographic category at p < .05.*
**Compare between rows.**

**Sex –** Men were approximately 1.8 times more likely than women to be moderate-risk or problem gamblers (2.6% versus 1.4%, p<.05).

**Age –** Slightly over 11% of Nova Scotia adults 19–24 years of age were at low risk, compared with approximately 4% among the other age categories (p<.05). No differences were observed for moderate-risk or problem gambling across the life span.

**Population Group –** People of non-European descent scored higher than those of European ancestry in all of the PGSI categories. Asian residents had higher representation in the low and moderate categories, and self-identified aboriginal respondents were more likely to be identified as problem gamblers ($p<.05$).

**NSHA Management Zone –** Residents in the Eastern Health Zone scored most frequently as low-risk gamblers than those in the other health zones (7.5% versus ≈4.5%, $p<.05$). No significant differences were found among the health zones with regard to moderate-risk or problem gambling.

**Household Income –** As income increases, at-risk gambling behaviour decreases. Those in the highest income category were significantly more likely to be in the low-risk group, and the largest proportion of moderate-risk gamblers come from the lowest income group ($p<.05$).

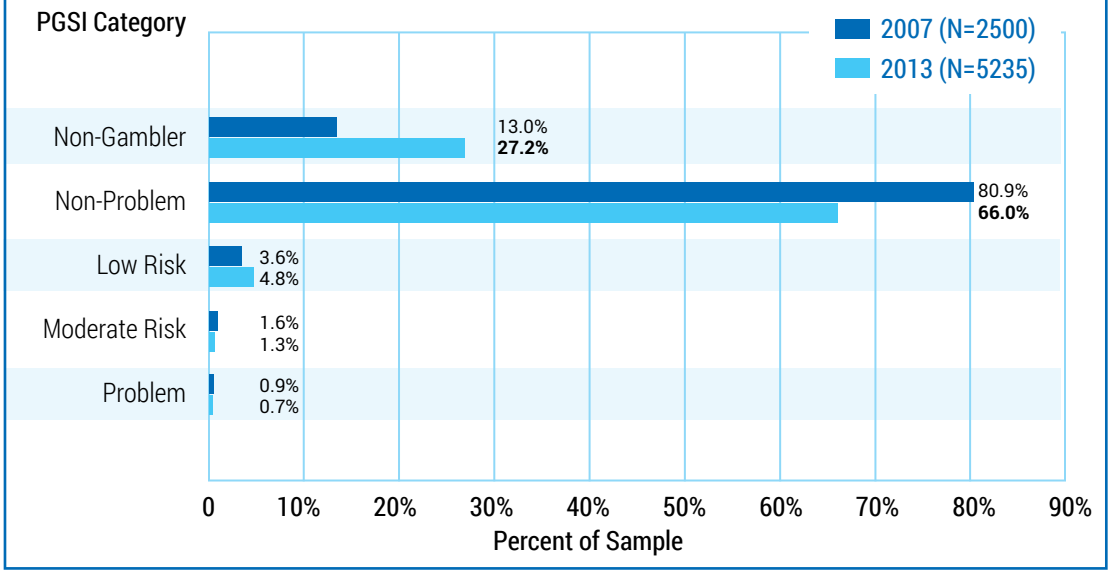
**Education –** Low education is also associated with all levels of risk classification. Respondents who reported high school education or less were four to five times more likely to fall within the moderate or problem classification than people with higher levels of education. In addition, when income and education are combined, respondents who earned less than $30,000 per year and had less than a high school education were statistically more likely to be in the moderate-risk category (6.2% versus 2.4%, $p<.05$).

**Marital Status –** Single Nova Scotians scored at higher levels of low-risk and problem gambling than those in other marital categories. The separated or divorced segment also had elevated levels of low-risk participation, compared with those married or widowed.

Levels of low- to moderate-risk and problem gambling remained statistically unchanged for all adult Nova Scotians between 2007 and 2013 (Figure 4). Moreover, the drop in participation came from the non-problem group; the number of past-year non-gamblers rose by approximately the same proportion (14.2%) as the decrease in the non-problem classification. This corresponds with an approximate 16.9% decline in provincial gambling revenues during the same period (Canadian Partnership for Responsible Gambling 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014), which suggests that at-risk gamblers were contributing a slightly larger proportion of revenues[18] than they had been. In addition, the reduction in participation has not been equal across all gambling activities.

18 As the pool of non-problem gamblers contributing to provincial gambling revenues shrinks, at-risk gamblers would contribute a larger proportion of the remaining revenues because of their increase in the proportion of gamblers.

**FIGURE 4** • Non-Gambler, Non-Problem, Low- to Moderate-risk and Problem Gamblers / Total Sample 2007 & 2013




**Bold text** *indicates a statistically significant difference between 2007 & 2013 at p < .05.*

## Prevalence of Low- to Moderate-risk and Problem Gambling Among Past-Year Gamblers

PGSI rates presented in Figure 4 above are from the entire population. However, approximately one-quarter of adult Nova Scotians had not gambled in the past year, which means they were not "at risk" during this period. When the *population of gamblers* is examined, the PGSI rates increase to 6.6% low-risk, 1.8% moderate-risk, and 0.9% problem gamblers, or 9.3% of past-year gamblers who were at some level of risk (Figure 5). In addition, gamblers in the low-risk classification increased by 2.4% which is the same percentage decrease among non-problem gamblers (See Figure 6). In other words, as participation among non-problem gamblers declined, the proportion of at-risk gamblers appears to have increased slightly (Figure 6 and Table 14).[19]

19 For example, one problem gambler would represent 10 per cent (1/10) in a group of ten gamblers. This would increase to 12.5 per cent (1/8) if the problem gambler remained in the population and two non-problem gamblers were removed without replacement.

**FIGURE 5** • Non-Problem, Low- to Moderate-risk & Problem Gamblers Among Past-Year Gamblers / 2013

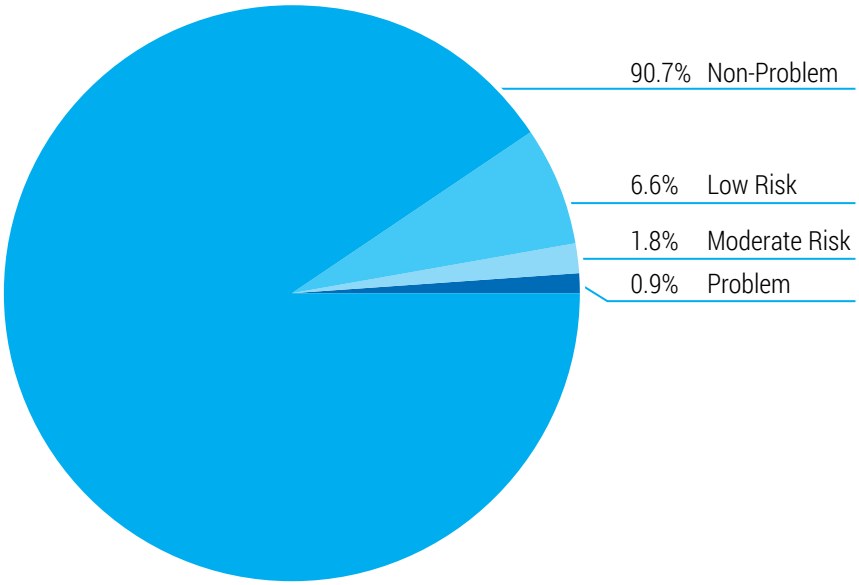
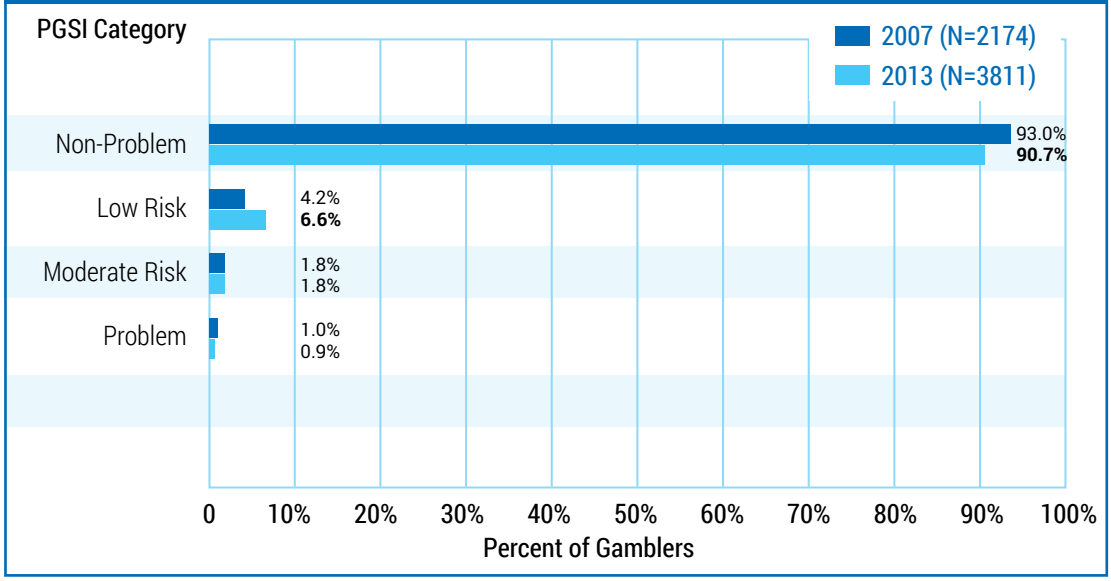



**FIGURE 6** • Non-Problem, Low- to Moderate-risk & Problem Gamblers Among Past-Year Gamblers / 2007 & 2013




**Bold text** *indicates a statistically significant difference between 2007 & 2013 at p < .05.*

**TABLE 8** • PGSI Scores by Sex, Age, Population Group, Health Zone, Household Income, Education and Marital Status Among Past-Year Gamblers / 2013

| Category | | | Non-Problem % | Low-risk % | Moderate-risk % | Problem % |
|---|---|---|---|---|---|---|
| | | N=3811 | 90.6 | 6.6 | 1.8 | 0.9 |
| **Sex** | Male | 1828 | 88.0 | **8.4** | 2.2 | **1.4** |
| | Female | 1983 | **92.9** | 5.1 | 1.5 | 0.5 |
| **Age** | 19-24 | 328 | **81.4** | **16.2** | 1.2 | 1.2 |
| | 25-34 | 525 | 91.1 | 6.3 | 1.3 | 1.3 |
| | 35-44 | 638 | 90.7 | 7.1 | 1.9 | 0.3 |
| | 45-54 | 872 | 91.2 | 5.6 | 1.8 | 1.4 |
| | 55-64 | 736 | 92.0 | 4.7 | 2.6 | 0.7 |
| | 65+ | 712 | 92.0 | 5.5 | 1.8 | 0.7 |
| **Population Group** | European | 3240 | 91.9 | 6.1 | 1.4 | 0.6 |
| | Aboriginal | 148 | **78.4** | **16.2** | 0.7 | **4.7** |
| | Asian | 58 | **74.2** | **15.5** | **10.3** | 0.0 |
| | African Nova Scotian | 40 | 85.2 | 7.4 | 7.4 | 0.0 |
| | Other | 325 | 87.1 | 6.2 | 4.9 | 1.8 |
| **Health Zone** | Central | 1668 | 91.5 | 5.3 | 1.9 | 1.3 |
| | Western | 788 | 91.9 | 6.1 | 1.6 | 0.4 |
| | Northern | 638 | 90.6 | 7.5 | 1.4 | 0.5 |
| | Eastern | 717 | **87.2** | **9.6** | 2.2 | 1.0 |
| **Household Income** | < $30,000 | 468 | **84.3** | **10.5** | **4.3** | 0.9 |
| | $30,001 - $59,999 | 807 | 89.1 | 6.8 | **2.4** | **1.7** |
| | $60,000+ | 2059 | 92.7 | 5.7 | 1.0 | 0.6 |
| | Income not given | 477 | 91.0 | 6.5 | 1.9 | 0.6 |
| **Education** | < Grade 12 | 486 | **84.8** | **10.3** | **3.3** | **1.6** |
| | High School | 615 | **86.7** | 8.6 | **2.4** | **2.3** |
| | Some University/College | 484 | 91.3 | 6.4 | 1.9 | 0.4 |
| | Complete University/College | 1758 | 92.2 | 5.7 | 1.6 | 0.5 |
| | Post Graduate | 468 | 95.5 | 3.8 | 0.2 | 0.4 |
| **Marital Status** | Single | 765 | **83.4** | **11.6** | 2.6 | **2.4** |
| | Married – Common Law | 2626 | 93.0 | 5.1 | 1.4 | 0.5 |
| | Separated – Divorced | 255 | 88.9 | 7.1 | 2.8 | 1.2 |
| | Widowed | 165 | 90.9 | 6.7 | 2.4 | 0.0 |

**Bold text** *indicates a statistically significant difference among the group categories p < .05.*
**Compare between rows.**

As shown in Table 8, low- to moderate-risk and problem gamblers are most likely to be single, male, 19–24, from aboriginal or Asian population groups, and residing in the Eastern Health Zone, with an income below $60,000 and a low level of education.

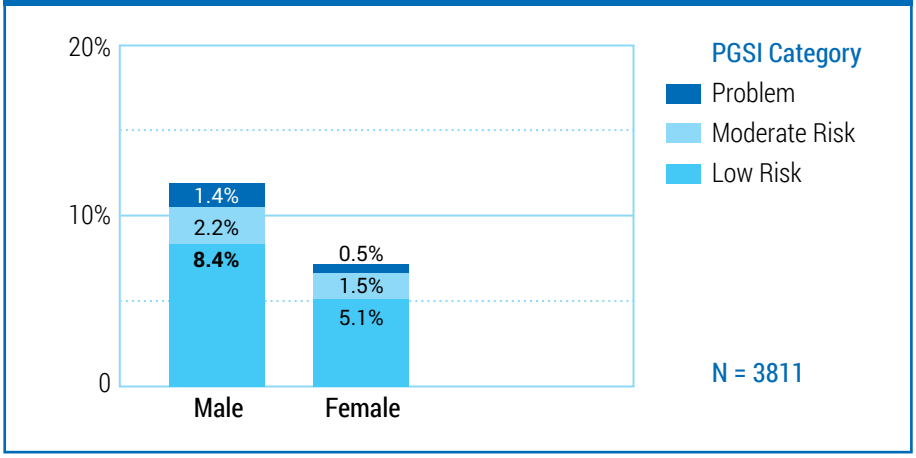
## Low- to Moderate-risk and Problem Gambling Among Past-Year Gamblers by Sex

The demographic category sex specifies the associations between at-risk gambling and the other demographic categories examined. While differences exist within age, population group, health zone, household income, level of education, and marital status, males are significantly more likely to fall within the moderate or problem PGSI categories in all of these demographic categories ($p<.05$).

As graphically demonstrated in Figure 7, men who had gambled in the past year were found more often than women in the low-risk category and almost three times more so in the problem classification. Men and women who were low- to moderate-risk and problem gamblers were equally predisposed to engage in all forms of gambling. However, men who scored at moderate-risk or as problem gamblers reported more involvement with scratch-n-win/breakopen tickets (7.0% versus 3.0%, $p<.05$) and slot machines (11.9% versus 4.0%, $p<.05$) than women.

Low-risk gambling increased among men and women between 2007 and 2013, with no differences found with the other PGSI categories (Table 9).

**FIGURE 7** • Low- to Moderate-risk & Problem Gambling Among Past-Year Gamblers by Sex / 2013 *




**Bold text** *indicates a statistically significant difference between the categories at p<.05*
** Non-Problem Gamblers not displayed*

**TABLE 9** • Non-Problem, Low- to Moderate-risk, and Problem Gambling Among Past-Year Gamblers by Sex / 2007 & 2013

| Sex | Year | N | Non-Problem % | Low-risk % | Moderate-risk % | Problem % |
|---|---|---|---|---|---|---|
| Male | 2007 | 1012 | **90.8** | 5.1 | 2.5 | 1.6 |
| | 2013 | 1828 | 88.0 | **8.4** | 2.2 | 1.4 |
| Female | 2007 | 1162 | **94.9** | 3.4 | 1.2 | 0.5 |
| | 2013 | 1983 | 92.9 | **5.1** | 1.5 | 0.5 |

**Bold text** *indicates a statistically significant difference between 2007 & 2013 p<.05*
**Compare between rows.**

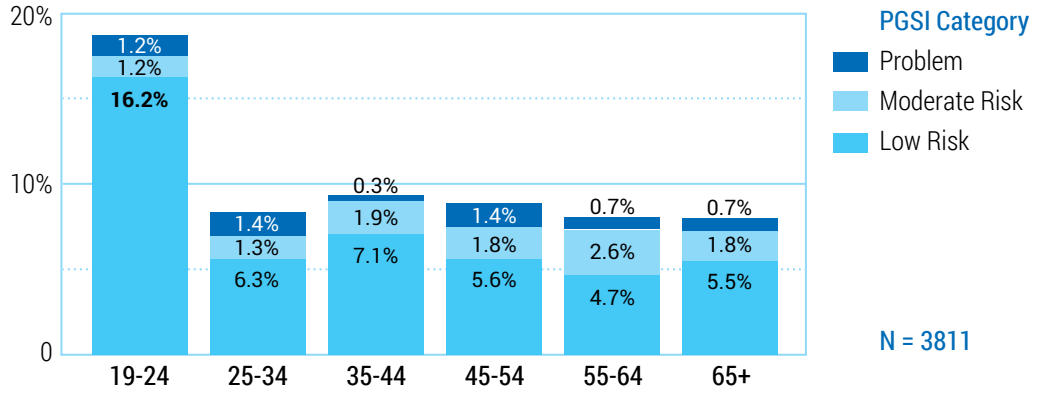
## Low- to Moderate-risk and Problem Gambling Among Past-Year Gamblers by Age

Young adults were most likely to be in the low-risk classification in 2013 (p<.05), with no statistical differences in the moderate-risk or problem classification (Figure 8).

Low-risk respondents aged 19–24 were more likely to have gambled on scratch-n-win/breakopen tickets (15.3% versus 5.8%, p<.05), VLTs (46.0% versus 12.4%, p<.05), casino slots (26.7% versus 16.9%, p<.05), and casino table games (35.9% versus ≈14.2%, p<.05) than adults over 24 years of age.

As shown in Table 10, low-risk gambling behaviour almost doubled among the 19–24 age group between 2007 and 2013, with moderate-risk gambling declining from 4.9% to 1.2%. At-risk gambling climbed almost three times among those 65+ years of age, and moderate-risk gamblers in this age category moved from 0.3% in 2007 to 1.8% in 2013 (Table 10).

**FIGURE 8** • Low- to Moderate-risk & Problem Gambling Among Past-Year Gamblers by Age / 2013 *




**Bold text** *indicates a statistically significant difference between the categories at p<.05*
** Non-Problem Gamblers not displayed*

**TABLE 10** • Non-Problem, Low- to Moderate-risk, and Problem Gambling Among Past-Year Gamblers by Age / 2007 & 2013

| Age | Year | N | Non Problem % | Low Risk % | Moderate-risk % | Problem % |
|---|---|---|---|---|---|---|
| 19-24 | 2007 | 126 | 86.4 | 8.7 | **4.9** | 0.0 |
| | 2013 | 328 | 81.4 | **16.2** | 1.2 | 1.2 |
| 25-34 | 2007 | 263 | 90.2 | 4.9 | 3.0 | 1.9 |
| | 2013 | 525 | 91.1 | 6.3 | 1.3 | 1.3 |
| 35-44 | 2007 | 478 | 91.5 | 5.4 | 2.3 | 0.8 |
| | 2013 | 637 | 90.7 | 7.1 | 1.9 | 0.3 |
| 45-54 | 2007 | 539 | 93.5 | 3.7 | 1.1 | 1.7 |
| | 2013 | 871 | 91.2 | 5.6 | 1.8 | 1.4 |
| 55-64 | 2007 | 398 | 94.2 | 3.0 | 1.8 | 1.0 |
| | 2013 | 736 | 92.0 | 4.7 | 2.6 | 0.7 |
| 65+ | 2007 | 370 | **97.3** | 2.4 | 0.3 | 0.0 |
| | 2013 | 714 | 92.0 | **5.5** | **1.8** | 0.7 |

**Bold text** *indicates a statistically significant difference between 2007 & 2013 p<.05*
**Compare between rows.**

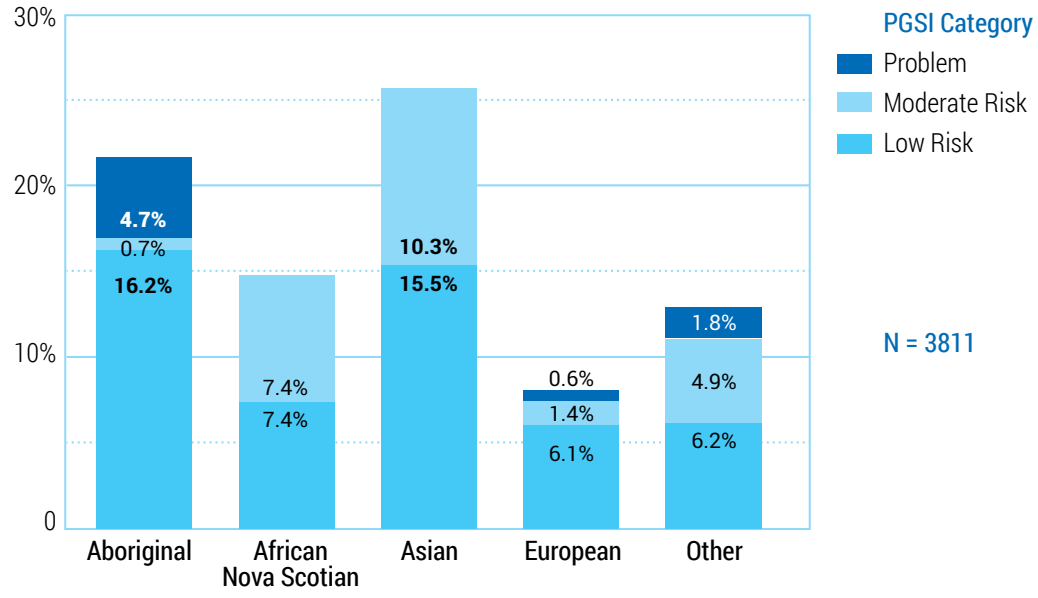
## Low- to Moderate-risk and Problem Gambling Among Past-Year Gamblers by Population Group

In 2013, a considerably higher proportion of respondents with aboriginal and Asian ancestry were in the low, moderate, or problem gambling categories. As shown in Figure 9, respondents of aboriginal and Asian descent were at higher risk than those of the other groups, but the aboriginal respondents were significantly more likely to score at problem levels. However, respondents of *non-European* descent had higher proportions in the low-risk (10.0% versus 6.1%, p<.05), moderate-risk (4.3% versus 1.4%, p<.05), and problem categories (2.3% versus 0.6%, p<.05).

Aboriginal respondents who were in the moderate-risk or problem classification gambled more on VLTs (21.7% versus ≈8%, p<.05) and casino slot machines (26.7% versus ≈4%, p<.05) than members of other population groups. Aboriginal and Asian respondents were also more likely to have gambled in casino table games (≈35% versus ≈5%, p<.05).

Population group had not been previously measured, making comparisons across time impossible.

**FIGURE 9** • Low- To Moderate-risk & Problem Gambling Among Past-Year Gamblers by Population Group / 2013 *



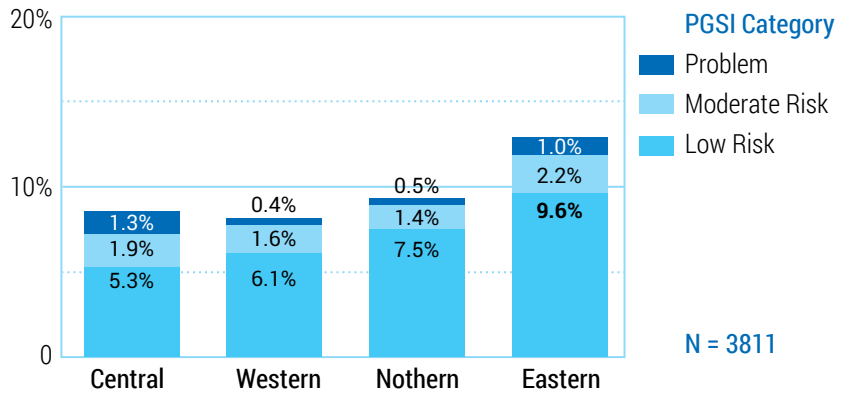

**Bold text** *indicates a statistically significant difference between the categories at p<.05*

** Non-Problem Gamblers not displayed*

## Low- to Moderate-risk and Problem Gambling Among Past-Year Gamblers by Health Zone

Adults residing in the Eastern Zone engaged in low-risk gambling more often than those in the other zones in 2013, with no significant differences found by type of gambling activity. Low-risk gambling scores have increased in the Northern and Eastern Zones since the last prevalence study (Table 11).

**FIGURE 10** • Low- To Moderate-risk & Problem Gambling Among Past-Year Gamblers by Health Zone / 2013 *




**Bold text** *indicates a statistically significant difference between the categories at p<.05*
** Non-Problem Gamblers not displayed*

**TABLE 11** • Non-Problem, Low- to Moderate-risk, and Problem Gambling Among Past-Year Gamblers by Health Zone / 2007 & 2013

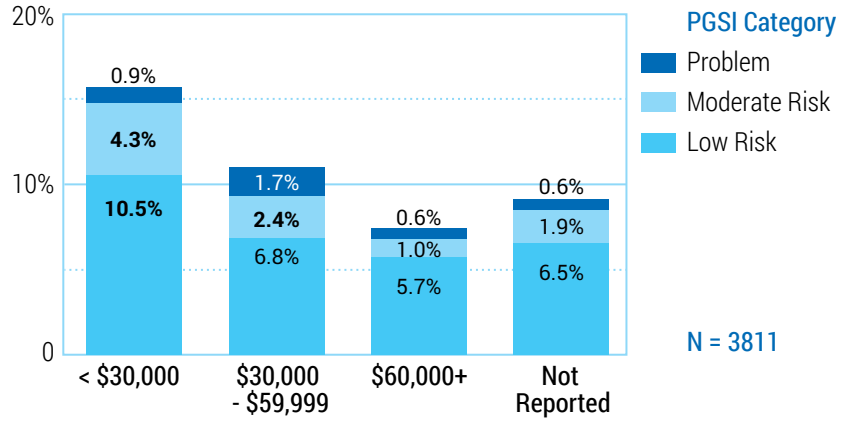
| Health Zone | Year | N | Non-Problem % | Low Risk % | Moderate-risk % | Problem % |
|---|---|---|---|---|---|---|
| **Central** | 2007 | 861 | 92.8 | 4.2 | 2.2 | 0.8 |
| | 2013 | 1668 | 91.5 | 5.3 | 1.9 | 1.3 |
| **Western** | 2007 | 468 | 93.4 | 3.8 | 1.9 | 0.9 |
| | 2013 | 788 | 91.9 | 6.1 | 1.6 | 0.4 |
| **Northern** | 2007 | 461 | 93.6 | 3.9 | 1.5 | 1.0 |
| | 2013 | 638 | 90.6 | **7.5** | 1.4 | 0.5 |
| **Eastern** | 2007 | 384 | **93.1** | 4.9 | 1.0 | 1.0 |
| | 2013 | 717 | 87.2 | **9.6** | 2.2 | 1.0 |

**Bold text** *indicates a statistically significant difference between 2007 & 2013 p<.05*
**Compare between rows.**

## Low- to Moderate-risk and Problem Gambling Among Past-Year Gamblers by Household Income

Household income is associated with low- to moderate-risk and problem gambling. Respondents from households with an income of less than $30,000 were considerably more often represented in the low and moderate-risk categories, while households with incomes in the $30,001–$59,999 category were most likely to have problem gamblers. Moderate-risk and problem gamblers with incomes below $30,000 had higher participation in daily lotteries (16.0% versus 4.1%, p<.05) and VLTs (33.3% versus 3.2%). Respondents with a household income above $30,000 and who were in the moderate-risk or problem classification gambled in casino table games substantially more than the members of the other income groups (24.9% versus ≈4%, p<.05). Low-risk gambling rose in the bottom and top income categories between 2007 and 2013 (Table 12).

**FIGURE 11** • Low- To Moderate-risk & Problem Gambling Among Past-Year Gamblers by Household Income / 2013 *




**Bold text** *indicates a statistically significant difference between the categories at p<.05*

** Non-Problem Gamblers not displayed*

**TABLE 12 •** Non-Problem, Low- to Moderate-risk, and Problem Gambling Among Past-Year Gamblers by income / 2007 & 2013

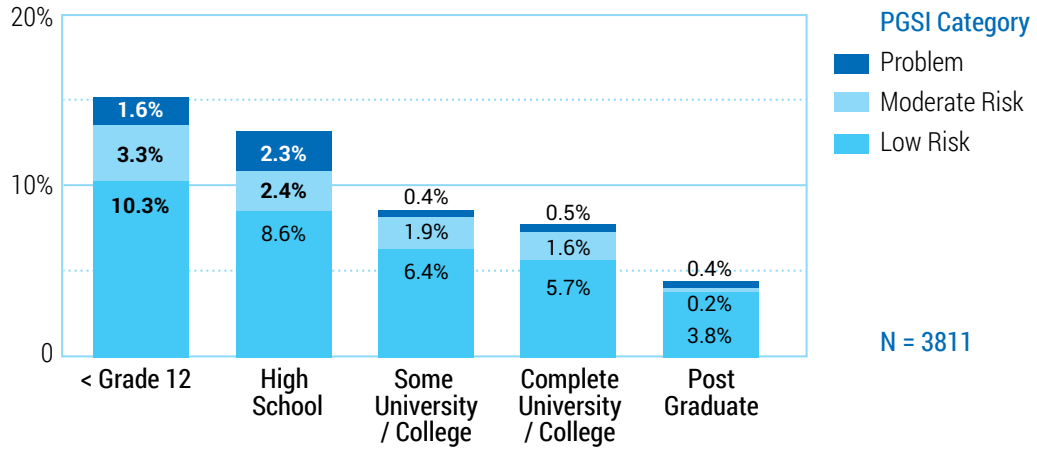
| Household Income | Year | N | Non-Problem % | Low Risk % | Moderate-risk % | Problem % |
|---|---|---|---|---|---|---|
| **> $30,000** | 2007 | 323 | **91.3** | 5.6 | 2.2 | 0.9 |
| | 2013 | 468 | 84.3 | **10.5** | 4.3 | 0.9 |
| **$30,001 - $59,999** | 2007 | 619 | 91.4 | 5.2 | 2.3 | 1.1 |
| | 2013 | 807 | 89.1 | 6.8 | 2.4 | 1.7 |
| **$60,000+** | 2007 | 797 | 94.4 | 3.0 | 1.6 | 1.0 |
| | 2013 | 2059 | 92.7 | **5.7** | 1.0 | 0.6 |
| **Unreported** | 2007 | 435 | 94.1 | 3.9 | 1.1 | 0.9 |
| | 2013 | 477 | 91.0 | 6.5 | 1.9 | 0.6 |

**Bold text** *indicates a statistically significant difference between the categories 2007 & 2013 at p<.05*
**Compare between rows.**

## Low- to Moderate-risk and Problem Gambling Among Past-Year Gamblers by Education

Respondents with high school education or below were noticeably overrepresented in the at-risk and problem gambling classifications. They also gambled more on VLTs (≈15% versus ≈5%, p<.05), on casino slot machines (≈20% versus ≈4%, p<.05), and in casino table games (≈40% versus ≈4%, p<.05). Low-risk gambling behaviour among these groups increased between 2007 and 2013, with no other statistical differences noted (Table 13.).

**FIGURE 12** • Low- To Moderate-risk & Problem Gambling Among Past-Year Gamblers by Education / 2013 *




**Bold text** *indicates a statistically significant difference between the categories at p<.05*
** Non-Problem Gamblers not displayed*

**TABLE 13** • Non-Problem, Low- to Moderate-risk, and Problem Gambling Among Past-Year Gamblers by Education / 2007 & 2013

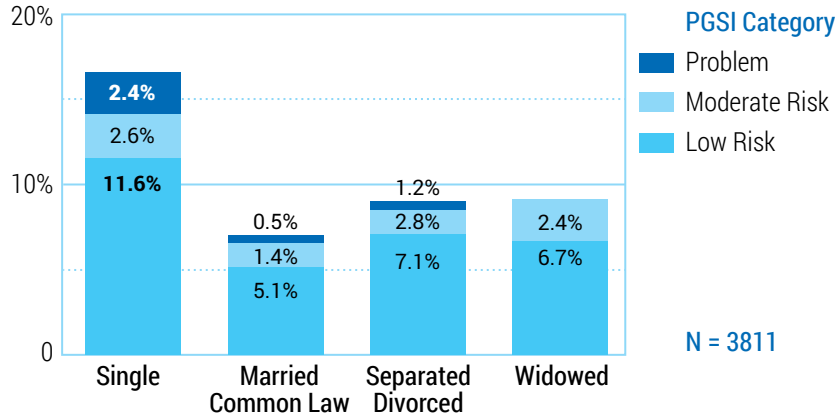
| Education | Year | N | Non-Problem % | Low Risk % | Moderate-risk % | Problem % |
|---|---|---|---|---|---|---|
| **> Grade 12** | 2007 | 477 | **92.2** | 4.0 | 2.1 | 1.7 |
| | 2013 | 486 | 84.8 | **10.3** | 3.3 | 1.6 |
| **High School** | 2007 | 434 | 93.1 | 4.1 | 1.6 | 1.2 |
| | 2013 | 615 | 86.7 | **8.6** | 2.4 | 2.3 |
| **Some University / College** | 2007 | 237 | 90.3 | 5.9 | 2.5 | 1.3 |
| | 2013 | 484 | 91.3 | 6.4 | 1.9 | 0.4 |
| **Completed University / College** | 2007 | 891 | 93.6 | 4.2 | 1.5 | 0.7 |
| | 2013 | 1758 | 92.2 | 5.7 | 1.6 | 0.5 |
| **Post Graduate** | 2007 | 134 | 96.2 | 1.9 | 1.9 | 0.0 |
| | 2013 | 468 | 95.6 | 3.8 | 0.2 | 0.4 |

**Bold text** *indicates a statistically significant difference between 2007 & 2013 at p<.05*
**Compare between rows.**

## Low- to Moderate-risk and Problem Gambling Among Past-Year Gamblers by Marital Status

Single respondents were at higher risk of gambling problems than those in other marital categories. Single persons in the at-risk or problem classifications gambled on daily lotteries (18.2% versus 2.9%, p<.05), VLTs (26.4% versus 1.6%, p<.05), casino slots (13.3% versus 3.5%, p<.05), and casino table games (10.6% versus 0.9%, p<.05). Since 2007, low-risk gambling has increased among those who are single, and married or living common law (Table 14.).

**FIGURE 13** • Low- To Moderate-risk & Problem Gambling Among Past-Year Gamblers by Marital Status / 2013 *




**Bold text** *indicates a statistically significant difference between the categories at p<.05*

** Non-Problem Gamblers not displayed*

**TABLE 14** • Non-Problem, Low- to Moderate-risk, and Problem Gambling Among Past-Year Gamblers by Marital Status / 2007 & 2013

| Marital Status | Year | N | Non-Problem % | Low-risk % | Moderate-risk % | Problem % |
|---|---|---|---|---|---|---|
| **Single** | 2007 | 345 | **88.4** | 7.5 | 3.2 | 0.9 |
| | 2013 | 765 | 83.4 | **11.6** | 2.6 | 2.4 |
| **Married – Common Law** | 2007 | 1543 | 94.1 | 3.5 | 1.6 | 0.8 |
| | 2013 | 2626 | 93.0 | **5.1** | 1.4 | 0.5 |
| **Separated - Divorced** | 2007 | 130 | 89.2 | 5.4 | 1.5 | 3.9 |
| | 2013 | 255 | 88.9 | 7.1 | 2.8 | 1.2 |
| **Widowed** | 2007 | 153 | 96.2 | 2.6 | 0.6 | 0.6 |
| | 2013 | 165 | 90.9 | 6.7 | 2.4 | 0.0 |

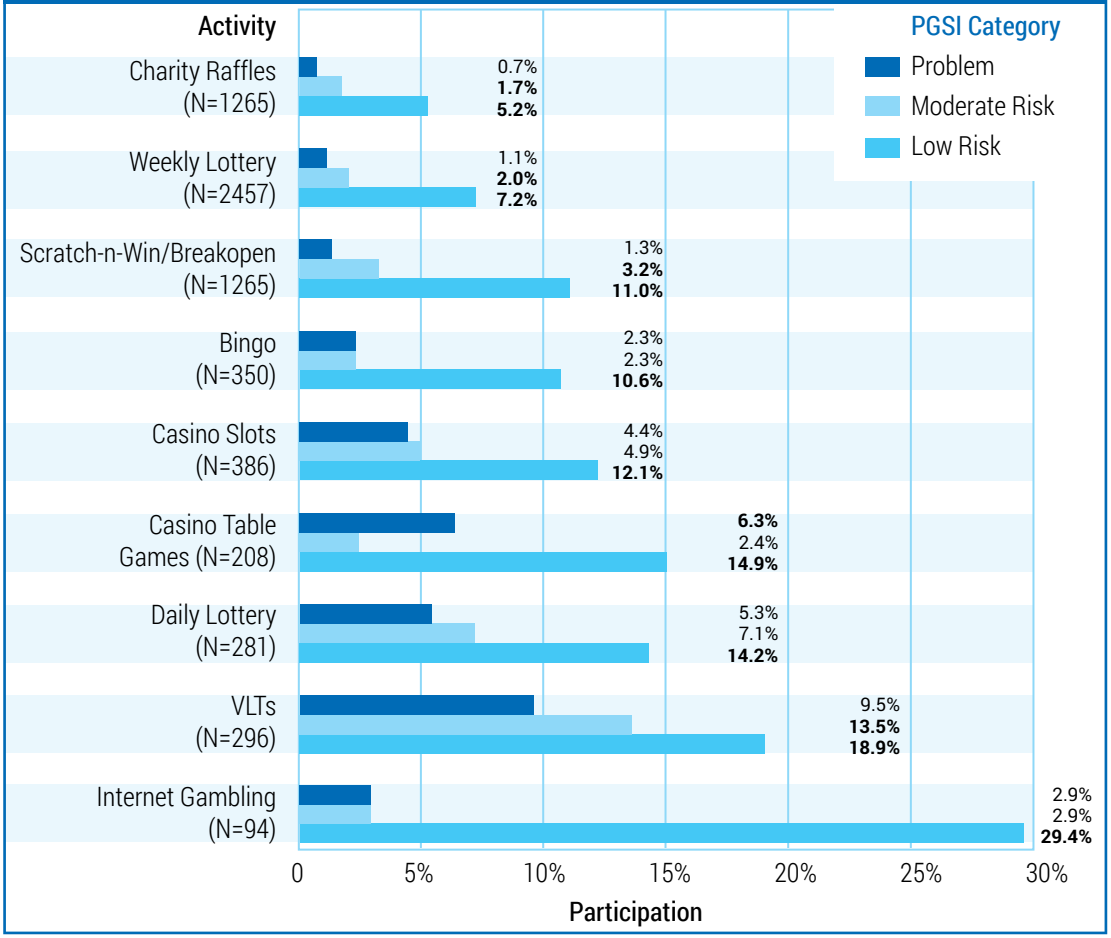
**Bold text** *indicates a statistically significant difference between 2007 & 2013 at p<.05*

**Compare between rows.**

## Low- to Moderate-risk & Problem Gambling Among Past-Year Gamblers by Participation in Gambling Activities

As shown in Figure 14, VLTs are associated with the highest level of risk, with a total of 41.9% of VLT gamblers at some degree of risk and 9.5% falling within the problem classification.[20] Moreover, VLTs are associated with statistically higher at-risk gambling behaviour than the remaining activities. Distinctions also exist *within* most of the gambling activities. For example, 14.2% of respondents who played daily lotteries were at low-risk compared with 7.1% at moderate-risk (p<.05), with no statistical differences between the moderate-risk and problem classifications.

**FIGURE 14** • Low- To Moderate-risk & Problem Gambling Among Past-Year Gamblers by Activity / 2013 *




** Non-Problem Gamblers not displayed*
*Horse Racing not displayed due to small sub-sample numbers*

20 Gamblers scoring within one of the risk categories are engaged in several forms of gambling. Accordingly, a single form of gambling in this study (VLTs, for example) may not be exclusively associated with risk. However, some forms display a stronger association than others.

Table 15 shows that participation declined in most gambling activities between 2007 and 2013, with non-problem gamblers making up the largest group of those withdrawing. Daily lotteries, VLTs, casino slots, and scratch-n-win/breakopen tickets were all substantially affected.

**TABLE 15** • Non-Problem, Low- to Moderate-risk, and Problem Gambling among Past-Year Gamblers by Activity / 2007 & 2013

| Category | | N | Non Problem % | Low Risk % | Moderate Risk % | Problem % |
|---|---|---|---|---|---|---|
| **Daily Lottery** | 2007 | 344 | 86.3 | 7.0 | 3.2 | 3.5 |
| | 2013 | 281 | **73.3** | **14.2** | **7.1** | 5.3 |
| **Weekly Lottery** | 2007 | 1748 | 92.4 | 4.8 | 1.7 | 1.1 |
| | 2013 | 2457 | **89.7** | **7.2** | **2.0** | 1.1 |
| **Scratch-n-win / Breakopen** | 2007 | 1588 | 88.7 | 4.7 | 2.0 | 1.3 |
| | 2013 | 1265 | **84.4** | **11.0** | **3.2** | 1.3 |
| **Charity Raffles 50/50 Draws** | 2007 | 1263 | 92.7 | 4.4 | 1.8 | 1.1 |
| | 2013 | 2412 | 92.3 | 5.2 | 1.7 | 0.7 |
| **Bingo** | 2007 | 290 | 86.9 | 10.0 | 1.7 | 1.4 |
| | 2013 | 350 | 84.9 | 10.6 | 2.3 | 2.3 |
| **VLTs** | 2007 | 339 | 76.4 | 11.5 | 6.5 | 5.6 |
| | 2013 | 296 | **58.1** | **18.9** | **13.5** | 9.5 |
| **Casino Slots** | 2007 | 387 | 86.3 | 8.0 | 3.9 | 1.8 |
| | 2013 | 386 | **78.6** | 12.1 | 4.9 | **4.4** |
| **Casino Table Games** | 2007 | 89 | 70.8 | 16.9 | 10.1 | 2.2 |
| | 2013 | 208 | 76.4 | 14.9 | 2.4 | 6.3 |
| **Internet Gambling** | 2013 | 94 | 64.7 | 29.5 | 2.9 | 2.9 |

**Bold text** *indicates a statistically significant difference between 2007 & 2013 at p<.05*
*Horse Racing & Internet Gambling 2007 not displayed due to small sub-sample numbers*
**Compare between rows.**

## Reported Mean Monthly Participation Among Past-Year Gamblers by Gambling Activity

Table 16 shows that low-risk, moderate-risk, and problem gamblers had higher monthly participation with daily lotteries and scratch-n-win/breakopen tickets than non-problem gamblers. Problem gamblers engaged in VLT gambling more often per month than other gamblers and casino slot gambling was approximately equal among moderate-risk and problem gamblers, but higher than among non-problem and low-risk gamblers.

**TABLE 16** • Average Monthly Frequency of Participation in Gambling Activities & PGSI Scores Among Past-Year Gamblers

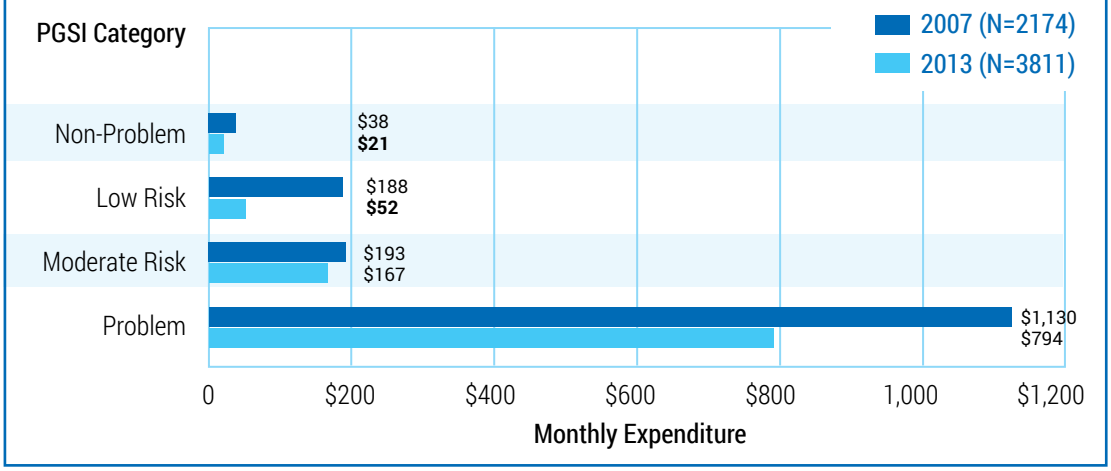
| | | Non Problem | | Low-risk | | Moderate-risk | | Problem | |
|---|---|---|---|---|---|---|---|---|---|
| Activity | Monthly Participation % N=3811 | Mean | Standard Deviation | Mean | Standard Deviation | Mean | Standard Deviation | Mean | Standard Deviation |
| **Daily lottery** | 3.9 | 3.2 | 4.6 | **7.2** | 8.4 | **6.3** | 9.5 | **11.4** | 11.3 |
| **Weekly lottery** | 37.8 | 3.3 | 3.3 | 4.0 | 3.6 | 3.7 | 3.0 | 5.4 | 3.7 |
| **Scratch-n-wins** | 15.7 | 2.5 | 2.8 | **4.9** | 9.8 | **6.4** | 10.6 | **14.3** | 15.1 |
| **Charity raffles** | 24.2 | 1.9 | 1.7 | 2.4 | 2.0 | 2.4 | 1.6 | 2.4 | 1.6 |
| **Bingo** | 4.1 | 2.5 | 2.4 | 3.5 | 3.9 | 2.9 | 3.6 | 1.9 | 2.7 |
| **VLTs** | 3.1 | 1.8 | 1.6 | 2.2 | 2.0 | **3.8** | 4.8 | **8.1** | 5.9 |
| **Casino Slots** | 2.5 | 1.4 | 0.9 | 1.3 | 0.9 | **2.0** | 0.9 | **2.1** | 1.3 |
| **Casino Table Games** | 1.3 | 1.4 | 0.9 | 3.0 | 6.3 | 3.0 | 1.0 | 2.7 | 3.1 |

**Bold text** *indicates a statistically significant difference among the group categories p < .05.*
*Horse Racing & Internet Gambling (ALC / Other Sites) not displayed due to small sub-sample numbers*
**Compare across columns.**

### Reported Mean Monthly Expenditure by Low- to Moderate-risk and Problem Gambling Among Past-Year Gamblers

Self-reported gambling expenditures should be regarded with caution because of issues with recall and the potential of social desirability biases. Given this caveat, it appears that non-problem and low-risk gamblers are spending considerably less money than those in the moderate-risk and problem categories (Figure 15). Non-problem gamblers' expenditures dropped 44.7% in 2013, compared to 2007, and people in the low-risk classification reduced their spending on gambling by 72.3%. While the moderate-risk and problem gamblers also reported lower expenditures, the findings are not statistically significant. Combined with the decline in participation among non-problem gamblers, these results point to a slightly higher proportion of revenue generation from gamblers most at risk for harm from their gambling.

**FIGURE 15** • Average Monthly Expenditure by Level of Gambling Risk Among Past-Year Gamblers




**Bold text** *indicates a statistically significant difference between the categories at p<.05*

Self-reported gambling expenditures indicate that 9.3% of past year gamblers were at risk for gambling-related harm contributed 42% of gross gambling revenues (GGR) in 2012–2013, with 0.9% providing approximately one-fifth of GGR (Figure 16). This figure is similar to the 39.2% reported in the 2007 study (Figure 17).

**FIGURE 16** • Estimated Contribution to Gross Gambling Revenues Among Past-Year Gamblers by PGSI Category / 2013

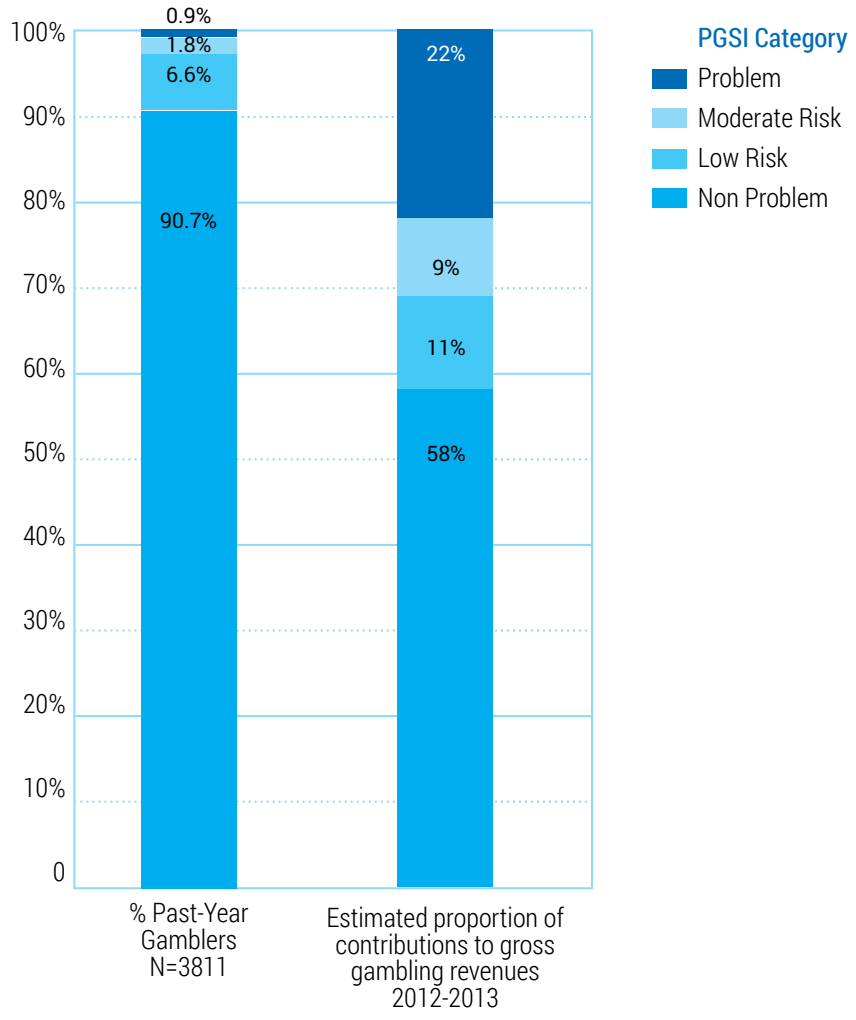
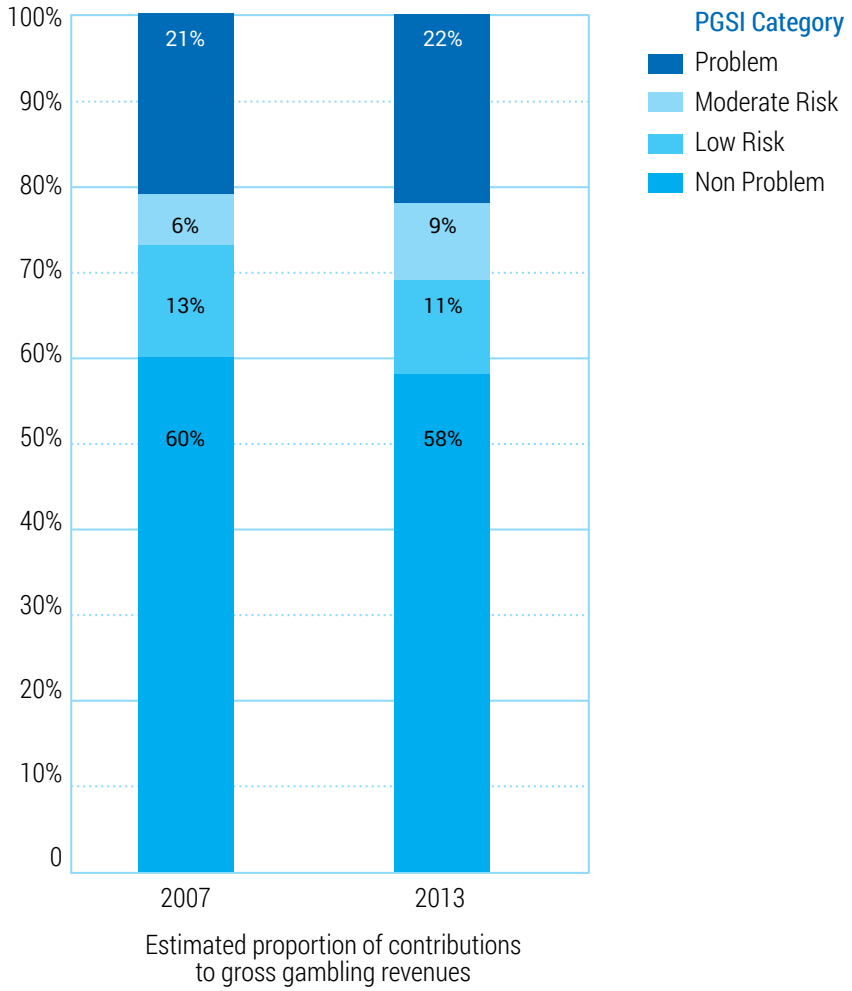
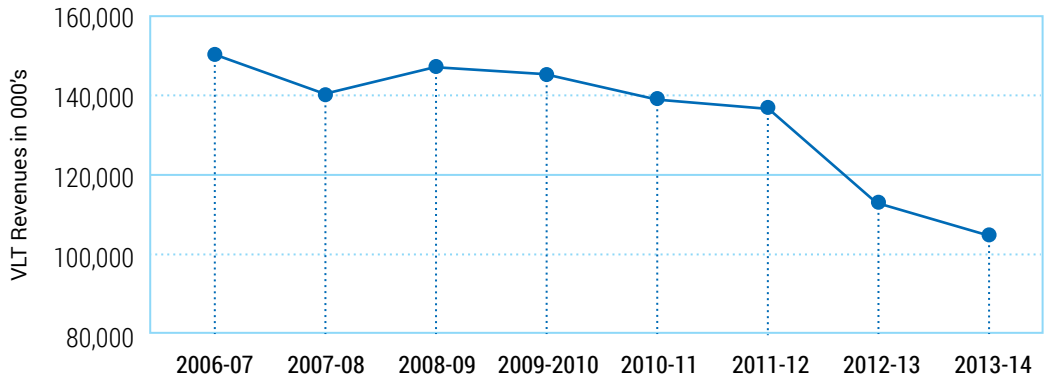


**FIGURE 17** • Estimated Contribution to Gross Gambling Revenues Among Past-Year Gamblers by PGSI Category / 2007 & 2013



It is important to note that electronic gambling products, such as VLTs, have been associated with higher risk for problem development (Maclaren 2015; Storer et al. 2009; Lund 2009). As such, it is of interest to explore further the participation and expenditures of VLT players across the PGSI risk categories. Trends in Gross Gambling Revenues (GGR) for casino slot machines and slot machines between 2007 and 2013 indicate that both have followed similar patterns suggesting a maturing market for these products. In addition, between 2005 and 2013, several policy initiatives have been undertaken to reduce risks associated with VLT gambling (Government of Nova Scotia 2005; Government of Nova Scotia 2011) As shown in Figure 18, these initiatives appear to have contributed to the impact of broader market forces upon VLT GGR.

**FIGURE 18** • Gross Gambling Revenues from VLTs / 2006 to 2014




*Source: Correspondence Nova Scotia Provincial Lotteries and Casino Corporation 2015*

# Health Status and Concurrent Disorders Among All Adults by PGSI Category

## Health Status

For the most part, perceptions of overall health status varied slightly among gamblers, regardless of level of risk. The departure from the trend lies with perceived excellent health: low- to moderate-risk and problem gamblers were less likely to report excellent health than non-problem or non-gamblers. However, this finding may be explained, in part, by a physical or chronic health problem. Approximately one-third of at-risk and problem gamblers reported a disability or chronic health problem, and none considered their health excellent. By contrast, most respondents without a disability or chronic health problem thought their health was excellent.

Similar patterns can be found with the remaining health conditions, suicide ideation, and suicide attempts. At-risk and problem gamblers were significantly more likely to report past-year health deterioration, mood and anxiety disorders, and thoughts of and attempts at suicide. However, past-year deterioration in health tripled among the entire sample for those who reported mood or anxiety disorders ($p<.05$). Suicidal ideation climbs among "non-gamblers" with mood or anxiety disorders from approximately 7% to roughly 38% ($p<.05$). Thoughts of suicide among moderate-risk and problem gamblers increases from 11.9% and 44.1% to 44.0% and 67.6%, respectively ($p<.05$). Attempted suicide moves from 2.8% of non-gamblers without mood or anxiety disorders to 15.0% of non-gamblers with these conditions, compared with 77.2% of problem gamblers who suffered from mood or anxiety disorders and reported attempting suicide ($p<.05$).

**TABLE 17** • Profile of Non-Gamblers and Past-Year Gamblers by Health Status and Mental Health Status

| | | Non-Gamblers % N=1425 27.2 | Non-Problem % N=3453 66.0 | Low-risk % N=253 4.8 | Moderate-risk % N=70 1.3 | Problem % N=34 0.7 |
|---|---|---|---|---|---|---|
| **Perceived Health Status** | Poor | 2.6 | 2.2 | 4.7 | 7.1 | 5.9 |
| | Fair | 14.2 | 12.5 | 19.8 | **28.6** | 20.6 |
| | Good | 50.6 | 54.0 | 56.1 | 48.6 | 52.9 |
| | Excellent | 32.5 | 31.2 | **19.0** | **15.7** | **20.6** |
| **Past-Year Health Deterioration** | Yes | 7.9 | 8.0 | **18.6** | **15.7** | **29.4** |
| **Mental Health** | Mood disorder | 8.2 | 6.8 | 9.9 | **20.0** | **35.3** |
| | Anxiety disorder | 6.1 | 5.9 | **7.5** | **12.9** | **20.6** |
| | Considered suicide | 7.7 | 6.2 | 7.9 | 11.9 | **44.1** |
| | Attempted suicide | 2.8 | 1.6 | 4.3 | 2.9 | **23.5** |
| **Physical disability / chronic health problem** | Yes | 19.8 | 18.2 | **28.0** | **37.7** | **32.4** |

**Bold text** *indicates a statistically significant difference among the group categories p < .05.*
**Compare across columns.**

While it is clear that at-risk and problem gamblers have higher levels of self-reported health and mental health problems and appear more likely to consider and attempt suicide, these factors, along with at-risk gambling, are intertwined. It is impossible to explain the underlying complex relationships without more detailed data.

## Concurrent Substance Use

Table 18 shows the prevalence of substance use by gambling participation and PGSI categories. Over-the-counter stimulants (for example, diet and wake up pills), hallucinogens, stimulants (cocaine, methamphetamine), club drugs (ecstasy), and opiates (heroin) did not show any statistically significant differences among groups at the p<.05 significance level and have been omitted. As observed in Table 18, at-risk gambling is associated with concurrent use of some substances.

**TABLE 18** • Profile of Non-Gamblers and Past-Year Gamblers by Substance Use

| | | Non-Gamblers % N=1425 27.2 | Non-Problem % N=3453 66.0 | Low-risk % N=253 4.8 | Moderate-risk % N=70 1.3 | Problem % N=34 0.7 |
|---|---|---|---|---|---|---|
| **Alcohol Consumption** | Any alcohol use past year | 71.9 | **84.4** | 73.3 | **70.0** | **93.3** |
| | 5+ Drinks on one occasion >= once per week | 5.7 | 5.9 | **13.2** | **25.0** | **44.8** |
| **Smoking** | | **12.5** | **16.3** | 34.0 | 40.0 | **64.7** |
| **Anti-depressants** | | 8.2 | 9.1 | 12.2 | **23.2** | 14.7 |
| **Tranquilizers** | | 2.5 | 1.6 | 0.8 | **10.0** | **14.7** |
| **Over the counter sleep medications** | | 3.8 | 4.0 | 5.5 | 1.4 | **14.7** |
| **Over the counter pain medications** | | 42.5 | 49.2 | 46.2 | 39.1 | 52.9 |
| **Prescription pain medications** | | 12.1 | 15.3 | 14.2 | 18.6 | **32.4** |
| **Marijuana** | | 5.4 | 7.5 | 11.0 | 12.9 | **47.1** |
| **Energy Drinks Consumed with Alcohol** | | 2.9 | 5.3 | **13.4** | 5.7 | **11.8** |

**Bold text** *indicates a statistically significant difference among the group categories $p < .05$.*
**Compare across columns.**

Overall, 82.0% of respondents declared past-year alcohol use, with the highest proportion of drinkers coming from the problem gambling group, followed by non-problem gamblers. As shown in Table 18, high-risk drinking increases with low- to moderate-risk and problem gambling behaviour, from 13.2% among low-risk gamblers to 44.8% of problem gamblers. Mixing energy drinks with alcohol is lowest among non-gamblers and non-problem gamblers and uppermost with low-risk gamblers and problem gamblers. However, those within the problem-gambling classification who mix energy drinks with alcohol do so less than once per month, compared with once per week among low-risk gamblers.

The prevalence of smoking among the general population in Nova Scotia is 16.9%. Non-gamblers are statistically below this rate and all at-risk gamblers above it, with just over two-thirds of problem gamblers smoking on a regular basis.

With the exception of the problem gambling group, the use of anti-depressants corresponds with the proportions of the sample suffering from mood disorders as indicated in Table 17. Approximately half of the problem gambling group *with a mood disorder* stated they had taken anti-depressant medication in the previous 12 months. A considerably higher proportion of moderate-risk and problem gamblers had used tranquilizers. Approximately 6.5% of the sample indicated problems with anxiety, but fewer had used tranquilizers. Gamblers in the problem group also used over-the-counter sleep medications considerably more often than members of the other groups.

Problem gamblers are roughly twice more likely to have used prescription pain medications. When holding chronic health conditions constant, those with a prolonged health problem are equally likely to have used prescription drugs for pain, but 26.1% of problem gamblers without a chronic condition reported having used these medications in the past year, compared with approximately 8% of the remainder ($p<.05$).

Marijuana use was approximately four times higher among the problem gambling group than among the remainder of the respondents.

## Other Factors Associated with Problem Gambling

Problem gambling does not solely affect the gambler; it has a negative impact on many people around them. Among problem gamblers, 61.8% stated their gambling had damaged their family finances, and 51.7% thought it had caused general problems for their family and 45.8% for their spouse or partner. A further 19.6% considered it as having produced problems for their friends, and 23.5% reported it was deleterious to people at their workplace.

Twenty-four per cent of the sample also reported knowing a spouse, partner, close relative, or close friend who they felt had a gambling problem. Seven per cent reported that an individual's gambling had caused personal difficulties for them; 8.1% considered a person's gambling as having had a negative impact on their family; 13.9% stated they knew of problems the gambler had caused for their friends; and 5.1% thought a gambler had triggered adverse effects in their workplace.

# Awareness of Gambling Support Services

Awareness of problem gambling support services has declined from 70.0% in 2007 to 60.6% in 2013 ($p<.05$). No statistically significant differences in awareness of gambling supports and services were found among non-gamblers or those within a PGSI level of risk.

Awareness varied by demographics and NSHA Management Zone. Forty-two per cent of non-gamblers aged 19–24 reported awareness of support services, compared with approximately 64% of the remaining age groups ($p<.05$). As income and education decreased, so did awareness of resources for at-risk and problem gamblers, from roughly 64% in high income and high education categories to 50% of those with a high school education or lower and/or a household income below $30,000 ($p<.05$). This relationship remained the same when examining only gamblers. Regarding marital status, 51% of single individuals knew of the services, in contrast with 62.3% of married people and 70.1% of those separated or divorced. In terms of health zone, the Eastern Zone had the highest level of awareness at 63.8%, followed by the Central and Northern Zones (≈61%) and the Western Zone (55.6%)($p<.05$). However, when data for only past-year gamblers was examined, the difference between the Eastern and Central Zone disappeared, with approximately two-thirds in both districts stating they were aware of services. The proportions in the other health zones also rose by 5% in each case.

Awareness of support services for *families* of at-risk and problem gamblers also declined from 46.9% in 2007 to 43.2% in 2013 ($p<.05$). Non-gamblers reported awareness of these services least, and moderate-risk gamblers were those most aware (34.5% versus 60%, $p<.05$). Among those at-risk for gambling harm, problem gamblers were least aware (48.6%, $p<.05$).

Patterns of awareness by demographics and health zone for family supports mirrored those for gamblers' supports, but the proportions were mostly lower. The 19–24 and 65+ age groups were least familiar: 29.9% and 37.4%, respectively, among non-gamblers ($p<.05$) and 36.1% and 41.4% of gamblers ($p<.05$), compared with roughly 50% of respondents in the remaining age categories ($p<.05$). Income and education also had an impact on awareness, with approximately 47–50% of those among the high income and high education groups aware, as opposed to roughly 39% in the lower income and education groups ($p<.05$); past-year participation in gambling had no effect. Awareness was also lowest for single individuals, at 38.4% of non-gamblers and 43.0% of gamblers. Those widowed had marginally higher awareness. Finally, people in the Eastern Zone were most familiar at 47.8% (51.7% of gamblers), with 44.4% in the Central Zone (48.0% gamblers), Northern Zone (≈42% non-gamblers and gamblers), and Western Zone (41.0% non-gamblers and 44.3% gamblers)($p<.05$).

Among at-risk gamblers, 10.6% of low-risk gamblers and 17.6% of moderate-risk gamblers claimed to have sought assistance from family or friends or through more formal services ($p<.05$). No problem gamblers reported seeking assistance or support.

# VLT Gambling at First Nations' VLT Sites

Among all VLT players, 24.3% reported having engaged in VLT gambling at a First Nations' site in the last year.[21]

**TABLE 19** • VLT Gambling at First Nations VLT Sites

| Category | | Participation % N=296 |
|---|---|---|
| **Sex** | Male | 24.3 |
| | Female | 24.1 |
| **Age** | 19-24 | 16.4 |
| | 25-34 | 22.2 |
| | 35-44 | 11.3 |
| | 45-54 | 26.4 |
| | 55-64 | **33.3** |
| | 65+ | **42.5** |
| **Population Group** | European | 22.3 |
| | Aboriginal | **56.5** |
| | Asian | 0.0 |
| | African Nova Scotian | 12.5 |
| | Other | 25.0 |
| **Health Zone** | Central | 16.4 |
| | Western | **37.1** |
| | Northern | 8.2 |
| | Eastern | **42.9** |
| **Household Income** | < $30,000 | 22.6 |
| | $30,001 - $59,999 | **34.1** |
| | $60,000+ | 17.7 |
| | Not Reported | **28.1** |
| **Education** | < Grade 12 | **45.3** |
| | High School | **30.6** |
| | Some University / College | 14.0 |
| | Complete University / College | 14.2 |
| | Post Graduate | 23.5 |
| **Marital Status** | Single | 19.6 |
| | Married - Common Law | 25.5 |
| | Separated - Divorced | 30.8 |
| | Widowed | 30.0 |

**Bold text** *indicates a statistically significant difference among the categories at p<.05*

21 All First Nations' VLT venues in Nova Scotia are located in First Nations communities.

**Sex –** No differences exist by sex except for those who self-identified as aboriginal. Male aboriginal respondents had gambled at FN VLT sites more than females (10.5% versus 1.1%, p<.05).

**Age – T**he proportion of VLT gamblers who visited an FN VLT site was highest among adults 55 years of age and older.

**Population Group –** Although the largest number of VLT gamblers at FN VLT sites were of European descent, they also make up the majority of the population of Nova Scotians. Aboriginal respondents had higher representation among their population group.

**Health Zone –** Visits among VLT players to a First Nations VLT site was highest in the Eastern and Western Health Zones. This may partly be explained by the fact that 68% of First Nations' VLTs are situated in these zones, compared with 10% of FN VLTS in the Central Zone. It may also explain higher aboriginal participation, since there are more First Nations communities in the Eastern Zone and a higher proportion of FN VLTs.

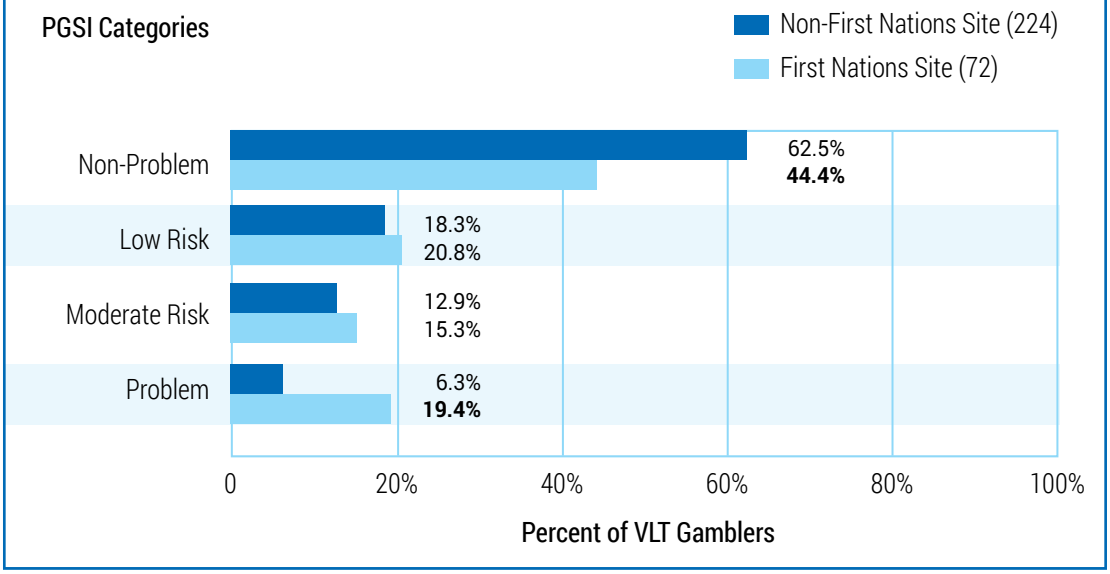
**Household Income –** People from middle income households and those who would not disclose their income visited FN VLT sites more frequently than those from other income groups.

**Education –** Low education is highly associated with VLT gambling at First Nations' VLT sites.

**Marital Status –** An individual's marital status had no effect on gambling at an FN VLT site.

Frequency of visits at FN VLT sites was higher, with an average of 4.3 times per month (standard deviation=.569) compared with 2.7 times per month at non-FN sites (standard deviation=.358) (p<.05). VLT gamblers at First Nations' VLT sites were as predisposed as problem gamblers to report a chronic illness or disability (38.0%, p<.05) and slightly less likely to describe their health as deteriorating in the previous year (22.5%, p<.05).

**FIGURE 19** • Non-Problem, Low- To Moderate-Risk & Problem Gambling at Non-First Nations and First Nations VLT Sites



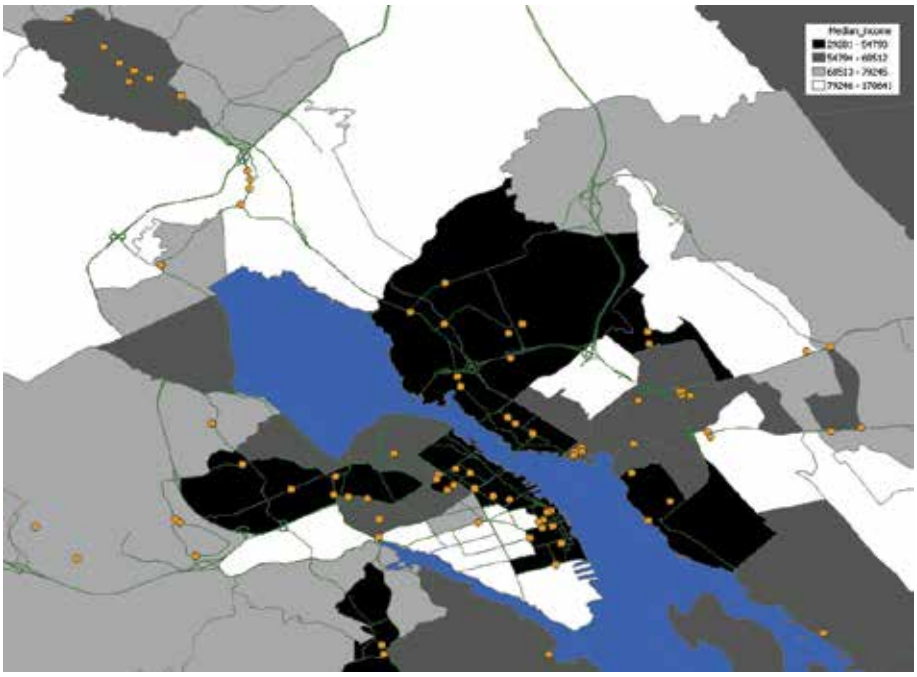

**Bold text** *indicates a statistically significant difference between the categories at p<.05*

As shown in Figure 19, VLT gamblers who visited an FN VLT site were roughly three times more likely to be in the problem PGSI classification. However, it is unknown whether problem gamblers seek out FN sites for personal reasons or whether structural features of FN sites are more appealing to problem gamblers than at non-FN sites. Problem gamblers who reported going to First Nations' VLT locations were most likely to be male (28.3% versus 7.1% female, p<.05), single (50% versus ≈12%, p<.05), 19–35 years of age (40.0% versus ≈15%, p<.05), reside in the Central Health Zone (45.2% versus ≈12%, p<.05), and have an education of high school or less (28.6% versus ≈10%, p<.05). Respondents of Asian descent had not visited an FN VLT location.

# VLT Locations and Socioeconomic Status

In 2010, the King's College Investigative Workshop examined VLT locations and income levels (based on Statistics Canada income data) within the Halifax Regional Municipality (HRM) (Figure 20). Their analysis found that neighbourhoods with the lowest income levels in HRM were four times more likely to have a VLT location than areas with the highest income levels (Vallance-Jones, 2010). However, VLTs are situated in liquor-licensed establishments, which are generally not situated in middle or upper-income neighbourhoods. Gilliland and Ross (2005) conducted a similar spatial analysis of VLTS in Montreal and controlled for liquor-licensed establishments, finding that the distribution of VLTs in that city closely reflected areas of socioeconomic disadvantage.

**FIGURE 20** • VLT Locations and Income Levels in Halifax

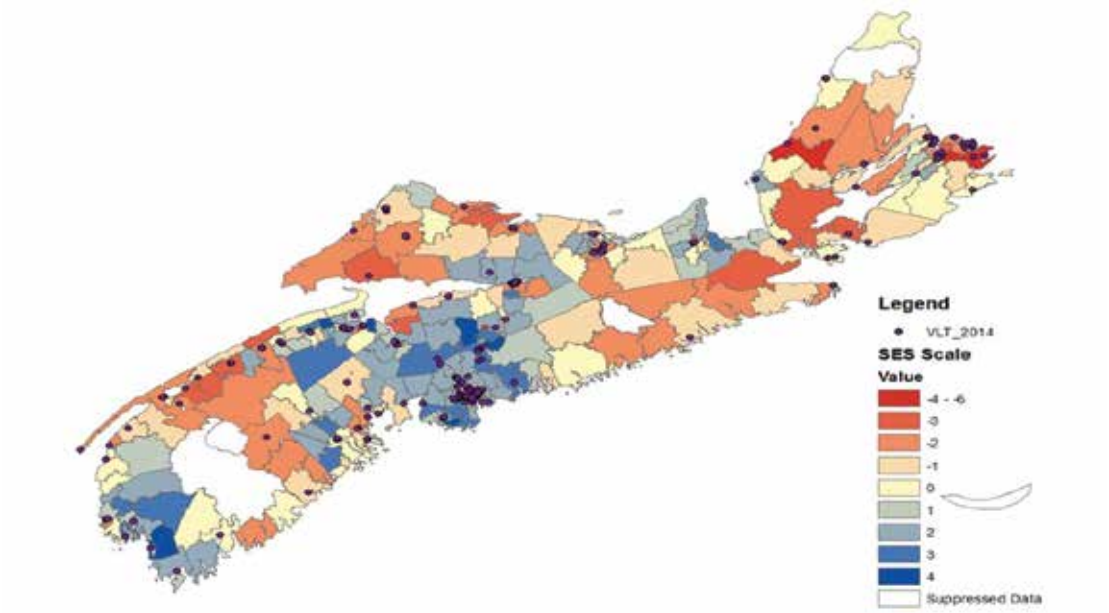


*Sources: Statistics Canada, Alcohol and Gaming Division, Labour and Workforce Development*

Since then, the former Nova Scotia Community Counts developed a socioeconomic status scale (SES) that is a relative measure of people and communities, using key social and economic indicators. SES is correlated with social determinants of health, risk factors for crime, and root causes of social issues, and the SES rating scale was designed to profile communities in Nova Scotia by calculating SES scores, which are then used for comparison.

Figure 21 shows the ratings for communities in relation to the SES categories, which were based on three indicators: low-income households, no certificate/ diploma/degree, and unemployment rate (aged 25+). The communities with the darkest red are rated -4 to -6, meaning that they have the lowest socioeconomic rating of all communities, while communities shaded dark blue are +4, the highest rating, and the remaining colours represent the range of ratings in between. Overlapping the communities and the SES rating scheme are establishments that have VLTs, with each location represented by a purple dot. In 2013, there were 327 VLT locations, operating a total of 2,193 machines.

**FIGURE 21** • VLT Locations and Socioeconomic Regions of Nova Scotia 2013




*Source: the former Nova Scotia Community Counts*

VLT venues were spread throughout Nova Scotia in 2013, with clusters of locations within the Halifax Regional Municipality and the Cape Breton Regional Municipality. The SES ratings show that the majority of communities falling into the lower categories (-1 through -6) had at least one VLT location within or in close proximity to that community, with the exception of the southeastern shore of the province.[22] A strong association between high density of electronic gambling machines (EGMs) and low socioeconomic neighbourhoods has been found in Australasia[23] (Brown et al., 2011; Livingstone & Adams, 2011; Wheeler et al., 2006), Canada (Gilliland & Ross, 2005), and Great Britain (Wardle et al., 2014). Williams et al. (2015: 139) provide evidence that proximity to EGMs has a weak causal impact on the onset of problem gambling but is a strong predictor of continuation or relapse of problem gambling. They further argue that many risk factors for problem gambling exist but that people with such risk factors have a tendency to reside in low socioeconomic neighbourhoods (2015: 10).

22 Figure 21 provides a general overview and does not allow for a detailed examination of VLT locations within municipalities. The Kings College Investigative Workshop findings and evidence from Australasia, Canada, and Great Britain suggest that the presence of electronic gambling machines in low socioeconomic neighbourhoods is common.

23 Australasia is a term used to denote the region comprising of Australia, New Zealand, the island of New Guinea, and neighbouring islands in the Pacific Ocean.

# Discussion

The *2013 Nova Scotia Adult Gambling Information Collection Project* (AGICP) assessed gambling participation and examined factors associated with low- to moderate-risk and problem gambling among Nova Scotia adults aged 19 years and older. The methodology used was equivalent to that used in the *2007 Nova Scotia Adult Gambling Prevalence Study,* allowing for comparisons between the two data collection points. The findings from this study are similar to those of previous prevalence studies in Nova Scotia and in other jurisdictions.

Participation in most gambling products has declined or remained constant since 2007, with the largest decreases in daily lotteries, video lotteries, casino slot machines, and scratch-n-win/breakopen tickets. Gambling involvement also dropped across all demographic categories and health zones. However, in terms of risk for gambling problems, non-problem gamblers reported a decrease in past year participation. This left a higher proportion of gamblers who scored in one of the three risk categories: low-risk; moderate-risk; and, problem gambling.

Monthly expenditure across all categories of risk were reduced among past year gamblers. However the reductions were statistically significant only among the non-problem and low-risk gamblers. As a result, the estimated proportion of contribution to provincial gambling revenues by risk category remained statistically unchanged from 2007. Low to moderate-risk and problem gamblers comprised 9.3% of past-year gamblers and provided an estimated 42% to provincial gambling revenues in 2012–2013.

A number of factors influenced the marketplace during the period 2007 to 2013 and contributed to the changes in participation and/or expenditures across the risk categories.

Gambling-related harm is not evenly distributed throughout the population of Nova Scotia. It has a stronger impact within specific groups, among people who at times are also at-risk within the social determinants of health. In this study, low- to moderate-risk and problem gambling was identified predominantly among the population groups that include people 19–24 years of age, single, male, low to moderate in level of household income, with a low level of education, and who self-identified as being of non-European descent (primarily aboriginal and Asian). Activities most strongly associated with moderate-risk and problem gambling included use of VLTS, casino games, and daily lotteries. VLT players who visited First Nations VLT sites were disproportionately identified as problem gamblers. Although the majority of First Nations' VLTs are located in the Eastern Health Zone, which had the highest per capita number of VLTs and the most VLT play, the proportion of VLT players who scored as problem gamblers was highest in the Central Health Zone. VLTs have been linked to continuation or relapse of problem gambling and are disproportionately situated in low socioeconomic neighbourhoods. The

findings of the 2013 AGICP reveal that moderate-risk and problem gamblers are predisposed to substance use, anxiety, depression, suicide ideation, and suicide attempts. Gambling-related harm is not restricted solely to gamblers; it affects families, friends, co-workers, and workplace environments.

Despite a relatively high awareness of support services for problem gamblers and concerned others, there has been low use of these services and resources (Nova Scotia Office of the Auditor General, 2015).

Prevalence studies can be integral to identifying health conditions within a population and useful for planning and for resource allocation. Prevalence shows how widespread a condition is within a population, but it does not account for the incidence rates (and risk factors) of new cases in the population. This is problematic when it comes to chronic conditions that have high levels of churn[24], since it can misrepresent the condition and misinform public debate about the extent of the problem (Reilly, 2009). Recent longitudinal studies suggest that prevalence studies may distort accurate estimates of gambling-related harm, since the majority of moderate-risk and problem gamblers either reduce or stop their gambling within an average of one year (el-Guebaly et al. 2015: 86; Williams et al. 2015:128) and are replaced by others along the way (Binde, 2013: 109). Thus, it is plausible that different gamblers experienced severe gambling problems during each of the six years between 2007 and 2013, which would mean that a higher proportion of the adult population of Nova Scotia may have experienced gambling-related harm during this period. In addition, non-problem gamblers appear to remain in the non-problem category over time (Williams et al., 2015), which might be indicative of the effectiveness of some responsible gambling and health promotion and prevention initiatives. In addition, many moderate-risk and problem gamblers do not seek treatment (Bellringer et al., 2008; Slutske, 2006; Williams et al., 2015), a phenomenon which may explain the low numbers of Nova Scotians who experience gambling-related harm but do not seek out formal help. It also appears that a high proportion of gamblers who experience gambling-related harm recover without the assistance of formal service providers treatment (Bellringer et al., 2008; Slutske, 2006; Williams et al., 2015). Lastly, prevalence studies provide superficial information about vulnerability and resilience to gambling problems, and do not permit calculations of rates of churn, which would more accurately convey the extent of gambling-related harm in the population. A robust surveillance and monitoring system is required to identify trends and enable evaluation of initiatives to determine which responsible gambling, prevention and treatment activities are successful and those that should be replaced or revised.

24 The churn rate is a business concept that refers to the proportion of customers who leave a business. As used here, it signifies the proportion of gamblers moving from high risk gambling behavior to no - low risk gambling behavior and vice versa.

# **Appendix A:** Glossary



**Churn:** The proportion of gamblers moving from high risk gambling behaviour to no or low risk gambling behaviour, and vice versa.

**Concurrent disorder:** Any combination of mental health and substance use problems that coincide.

**Gambling-related harm:** Negative consequences from repetitive gambling for the individual gambler, their family, social network, or community; this can include financial, mental, and physical problems (Abbott et al., 2013: 5).

**Gross gambling revenues:** The amount wagered, minus the total sums paid out as prizes, without deductions for operating expenses.

**Incidence:** The number of new cases that develop a disease or condition over a given period of time.

**Inverse relationship:** The relationship between two variables whereby an increase in one occurs with a decrease in the other.

**Prevalence:** The proportion of people in a population who have a disease or condition at any given point in time.

**Socio-spatial:** The intersection of social, cultural, political, and economic relations within a specified geographic space.

**Standard deviation**: The distribution of data around its mean average; the more spread apart the higher the deviation.

**Statistical association:** The relationship between two variables which makes them statistically dependent upon or associated with each other.

**Statistical significance:** a quantitative difference that is considered not to have occurred by chance. Statistical significance is usually expressed as a level of probability (*p*), and the lower the p value, the less the probability that the result is random. Statistical significance does not denote practical significance.

# **Appendix B:** Problem Gambling Severity Index

The Problem Gambling Severity Index (PGSI) is a subset of questions taken from the Canadian Problem Gambling Index (CPGI). The PGSI has been used in Nova Scotia gambling surveys since 2003 in order to assess gambling-related risk and harm in the general population. The PGSI is a self-reported nine-item instrument used to evaluate the severity level of gambling-related harms (Ferris & Wynne, 2001).

The PGSI score is based upon respondents' answers to the following set of questions:

*Thinking about the last twelve months, would you say you never, sometimes, most of the time, or almost always:*

1. Bet more than you could really afford to lose?
2. Needed to gamble with larger amounts of money to get the same feeling of excitement?
3. When you gambled, you went back another day to try and win back the money you lost?
4. Borrowed money or sold anything to get money to gamble?
5. Felt that you might have a problem with gambling?
6. People have criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?
7. Felt guilty about the way you gamble, or what happens when you gamble?
8. Gambling has caused you any health problems, including stress or anxiety?
9. Gambling has caused any financial problems for you or your household?

Scores for each question are provided as follows:

Never = 0
Sometimes = 1
Most of the time = 2
Almost always = 3

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