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In Pursuit of Empirically Based Responsible Gambling Limits

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ABSTRACT *The present study sought to (1) obtain expert opinion on the importance of low-risk limits for the field of gambling; and (2) establish the face validity for a tentative set of low-risk limits empirically derived from a recent analysis of population data on gambling (Currie et al., 2006). Gambling experts (171 researchers, clinicians and policy-makers in Canada and the United States) completed an online or paper survey to assess their support for the concept of low-risk gambling limits, their opinions of existing responsible gambling guidelines and the face validity of tentative low-risk limits for gambling frequency, dollars spent, percentage of gross income spent on gambling and duration per session. The majority of those surveyed endorsed the need for low-risk limits and rated the limits as being face valid. Concerns voiced pertaining to their dissemination to the public included the potential for creating a false sense of security among gamblers, encouraging people to gamble and difficulties in applying the limits across different forms of gambling.*

Introduction

Moderate drinking limits are in place defining low-risk alcohol consumption. In the context of addictive behaviours, a low-risk limit is a maximum threshold of consumption that research and expert opinion deems as being 'safe'. Guidelines are general advice to promote safe use of the addictive product (e.g. avoid drinking and driving). Responsible drinking guidelines include low-risk limits (e.g. consume no more than two standard drinks per day) whereas responsible gambling guidelines do not incorporate quantitative limits. The low-risk drinking limits are widely promoted by government agencies, professional bodies, addiction research institutions and the World Health Organization (Addiction Research Foundation/Canadian Centre on Substance Abuse, 1994; Babor *et al.*, 2003; Dawson *et al.*, 2004).

The need for comparable low-risk limits for gambling has been acknowledged (Blaszczynski and Nower, 2002; Korn and Shaffer, 1999). Research indicates that, similar to alcohol, there is a continuum of risk associated with gambling that increases with greater participation (Currie *et al.*, 2006). Several government agencies, addiction foundations and even organizations representing the gaming industry have advanced various sets of responsible gambling guidelines intended for consumers who choose to gamble. Guidelines referring to expenditure and frequency of gambling provide no quantitative cut-offs (Svendsen and Griffen, 1998). Research to date indicates that problem gamblers invest more time and

money into gambling activities compared to moderate and low-risk gamblers (Ferris and Wynne, 2001; Marshall and Wynne, 2003; Wiebe *et al.*, 2001). New research is emerging that suggests quantitative cut-offs defining an upper limit of safe gambling participation levels may be possible (Currie *et al.*, 2006; Weinstock *et al.*, 2007).

Several challenges exist that are unique to gambling and could impede the development of low-risk limits. Foremost, a definition of low-risk or responsible gambling has yet to be universally accepted (Blaszczynski *et al.*, 2004). The continuum of gambling extends from the extremes of no gambling at one end to pathological gambling at the other end. This encompasses a wide spectrum of gambling behaviour. The exact place that responsible gambling falls along this continuum is not clear, although one could argue that any level of gambling that does not contribute to harm could be defined as responsible. A related challenge is quantifying the dimensions of gambling intensity that may be causally related to risk of harm. A standard unit of gambling (akin to a standard drink) has not been developed. Quantity has a fundamentally different meaning in the context of gambling compared to drinking. Amount of money spent on gambling needs to be assessed against the gambler's income level (Volberg, 1994). In addition, different types of games carry varying degrees of risk. Electronic gaming machines featuring a short time span between the bet and outcome are considered more problematic (Breen and Zimmerman, 2002; Korn and Shaffer, 1999). Furthermore, comorbid psychiatric illness increases the risk of problem gambling (el-Guebaly *et al.*, 2006; Petry *et al.*, 2005).

Despite these challenges numerous arguments can be made for exploring the application of low-risk gambling limits. Gambling is one of the fastest growing industries in North America (Azmier, 2005; Raylu and Oei, 2002). Furthermore, few external controls on gambling exist and the outward signs of problem gambling can be subtle (Raylu and Oei, 2002). Low-risk limits could have potential in prevention efforts and treatment. For example, studies indicate that controlled gambling is a viable treatment goal for some gamblers (Blaszczynski *et al.*, 1991; Dickerson, 1990; Hodgins *et al.*, 2001; Robson *et al.*, 2002; Toneatto and Sobell, 1990; Weinstock *et al.*, 2007). In one study, gamblers enrolled in a harm reduction approach to treatment were instructed to spend no more than five per cent of their net income on gambling (Robson *et al.*, 2002). This five per cent limit derived from population data showing that Canadians spend on average about five per cent of their monthly income on recreation. Such a quantitative limit provides gamblers who choose non-abstinence as a treatment goal with a maximum threshold of gambling intensity to self-monitor their spending habits. For novice consumers of gambling, low-risk limits could be promoted to augment existing responsible gambling guidelines to provide inexperienced gamblers with a practical notion of the limits of 'safe gambling'.

A methodology for devising low-risk limits emerged in the field of alcohol research. Using risk curve analysis, epidemiologists have consistently found a clear relationship between daily consumption of alcohol and potential for adverse consequences (Babor *et al.*, 2003). Risk curves depicting the relationship between consumption level and chance of harm contributed to the development of the weekly drinking limits (Bondy *et al.*, 1999). The J-shape of the alcohol risk curve, which suggests that low to moderate alcohol consumption is not only safe but may instil health benefits in some populations compared to abstinence, continues

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to stimulate debate and controversy (Fillmore *et al.*, 2008). Furthermore, the impact of widespread dissemination of low-risk drinking guidelines on the drinking habits of the general public remains an under-researched topic (Walsh *et al.*, 1998). Epidemiological research conducted in the United States over a ten-year period (1992 to 2002) demonstrated a reduction in the proportion of the adult drinking population who exceed the recommended low-risk weekly limits (Dawson *et al.*, 2004). However, it is difficult to attribute this reduction specifically to low-risk drinking advice, given that other interventions to curb harmful drinking (e.g. higher taxes, more stringent penalties for impaired driving) may have been introduced during the same time period, and the low-risk guidelines were not broadly disseminated until the late 1990s.

Although the unique contribution of low-risk drinking advice as an effective prevention tool has not been established, most alcohol researchers agree there is value to the quantitative limits in educating the public when the information is combined with other guidelines and population-level interventions intended to prevent alcohol-related harm (Babor *et al.*, 2003). Moreover, the low-risk drinking limits allows epidemiologists to quantify for policy-makers data on drinking habits in the context of health risks for population health surveillance purposes. For example, knowing that 25 per cent of a nation's drinking population exceeds daily or weekly guidelines for alcohol consumption is more informative to decision-makers than reporting the prevalence of alcohol-dependent individuals or the annual per capita consumption.

We recently applied the same risk curve methodology used to aid in the development of the low-risk drinking guidelines to a national probability sample of Canadians surveyed on gambling behaviour and problems. This work produced a tentative set of low-risk gambling limits for frequency, amount spent and percentage of gross income spent on gambling (Currie *et al.*, 2006). The data source was the Canadian Community Health Survey – Mental Health and Well-being Cycle (Cox *et al.*, 2005), a cross-sectional, in-person survey of a nationally representative sample of over 36,000 individuals aged 15 years and older. The optimal low-risk limit for gambling participation was identified using receiver operating characteristic (ROC) analysis. A cut-off for each parameter was chosen to maximize the discrimination between the presence or absence of harms, giving equal weighting to sensitivity and specificity. The optimal cut-off for frequency was gambling more than two to three times per month (sensitivity 88.3%; specificity 58.7%), for dollars it was spending more than C\$501–1,000 per year (sensitivity 78.3%; specificity 69.5%), and for percentage of gross income spent on gambling it was more than 1% (sensitivity 73.5%; specificity 73.7%). Each of the low-risk limits demonstrated a robust relationship with risk of harm that was independent of other known predictors of problem gambling including gender, age and socio-economic status. We have since replicated these results on another data set using the same measures of gambling and definition of harm (Currie *et al.*, 2008). This analysis also produced a low-risk limit for duration of gambling per session (60 minutes; sensitivity 85.4%; specificity 60%; unpublished data).

Independently, Weinstock *et al.* (2007) employed the identical statistical methodology to identify quantitative limits of moderate gambling in pathological gamblers who continued to gamble following treatment. In their analysis, harm from gambling was defined on a basis of reporting at least one symptom from the

South Oaks Gambling Screen (SOGS) (Lesieur and Blume, 1987). Among 178 pathological gamblers who participated in a cognitive-behavioural treatment programme, gambling behaviours that reliably differentiated problem-free (SOGS score = 0) and symptomatic gambling (SOGS score ≥ 1) were gambling no more than once per month, gambling for no more than 1.5 hours per month and spending no more than 1.9% monthly income on gambling. The quantitative cut-offs increased when a higher SOGS score was used as the threshold for defining harm; however, the sensitivity and specificity values were optimized when a SOGS score ≥ 1 was used as the threshold. This study is noteworthy because it suggests the concept of a moderation limit may also be applied to problem gamblers who opt for controlled gambling rather than abstinence. Furthermore, the actual limits derived from this study are similar to the low-risk limits produced by our research group.

The research conducted by our team and the Weinstock group relied on statistical criteria to determine optimal low-risk limits for gambling intensity. However, fulfilling statistical criteria is only the first step towards establishing a limit that may eventually be disseminated to the public. Low-risk gambling limits should also have the acceptance of professionals working in the field. The aim of the present study was to solicit expert opinion on the importance of low-risk limits for the field of gambling. We were specifically interested in the degree to which researchers and non-researchers in the field embraced the concept of low-risk gambling limits, their concerns regarding dissemination of limits to the public and their opinions on the face validity of a tentative set of low-risk limits that have been empirically derived. Because the limits were derived from a North American sample, expert opinion was sought from professionals residing in Canada and the US only. Because there are differences in the availability and regulation of gambling, we were also interested in differences between Canadian and US opinions. Such differences may influence the cross-border receptiveness of low-risk limits that may eventually derive from this line of research.

Methods

Opinion Survey of the Importance of Low-Risk Gambling Limits

A 35-item survey instrument (provided in the Appendix) was constructed to gather expert opinion on the feasibility of low-risk gambling limits. The survey was pilot-tested on ten individuals before widespread distribution. A mailing list of gambling researchers, clinicians, policy makers and other experts in the field was constructed from the following sources: (1) Medline and PsychInfo; (2) national, provincial and state gambling research councils, addiction foundations and granting agencies; (3) organizations disseminating information on responsible gambling (e.g. National Center for Responsible Gaming); (4) the list of national certified gambling counsellors provided by the National Centre for Problem Gambling; and (5) the Gambling Issues International Listserv. Personalized e-mails or regular mail-outs were sent to 460 individuals with two follow-up notices spaced three weeks apart.

Participants could return the survey via e-mail, regular mail or using a password-protected web-survey form. The survey sought opinions on:

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- (1) The perceived importance of low-risk gambling limits (four-point scale from 1 'very important' to 4 'not at all important').
- (2) Assumptions underlying responsible gambling strategies (four items were adapted by the Reno Model framework for responsible gambling that was advanced by Blaszczynski *et al.*, 2004). Each item was assessed using a five-point scale from 1 'strongly agree' to 5 'strongly disagree'.
- (3) Potential benefits of low-risk gambling (five-point scale from 1 'not at all beneficial' to 5 'very beneficial').
- (4) Importance (four-point scale from 1 'very important' to 4 'not at all important') of a sample of responsible gambling guidelines; the 11 guidelines previously promoted by the Responsible Gaming Council of Ontario (Responsible Gaming Council of Ontario, 2003).
- (5) The face validity (one to ten scale with anchors 1 very conservative, 5 just right, 10 very liberal) and the relative importance of each low-risk limits for further consideration and promotion (ratings of importance from 1 'very important' to 4 'not at all important').
- (6) Suggestions for a label for low-risk gambling limits (five choices provided).
- (7) Because opinions vary on the inclusion of lottery play in the definition of gambling (Grun and McKeigue, 2000) and research by our group showed that the slope of the risk curves for frequency of gambling can change with the exclusion of lottery players (Currie *et al.*, 2006), participants were asked whether lotteries should be included in low-risk gambling limits and whether limits should be different for each type of gambling (five-point scale from 1 'strongly agree' to 5 'strongly disagree').
- (8) Open-ended questions solicited comments on these issues and basic demographic information was collected on each participant.

Results

Response Rate

Of the 460 e-mails and regular mailings sent out, 33 (7%) were returned because of an incorrect e-mail or postal address, or the individual declined to participate. The most often cited reason for declining was the individual no longer viewed him- or herself as a gambling expert ($n = 8$). We have no information on the remaining 289 non-respondents; we can only assume they chose not to participate. No differences were found in the response rates between Canadian and American experts or researchers versus non-researchers. A total of 171 completed surveys were returned making the response rate 37% among eligible recipients (i.e. excluding self-identified non-experts) of the survey. Table 1 displays the characteristics of the sample.

Opinions on Current Responsible Gambling Guidelines

Existing responsible gambling guidelines were favourably viewed by respondents, as shown in Table 2. For every guideline, the combined proportion of respondents giving 'very important' and 'somewhat important' ratings exceeded 73%.

Table 1. Sample characteristics

Characteristic	% or mean \pm SD
Country base	
Canada	48%
US	52%
Age	48 \pm 10.9
% male	65%
Primary position in last 5 years	
Researcher	34%
Clinician	28%
Clinician researcher	17%
Administration/policy maker	21%
Years working in the field of gambling	8.6 \pm 6.2
% providing clinical service to gamblers	51%
Educational background (%)	
Undergraduate	9%
Graduate	76%
MD	8%
Certificate/degree/diploma in addiction counselling	7%

Assumptions Underlying Responsible Gambling Strategies

Respondents were asked how much they agreed with the following statements: (1) safe levels of gambling participation are possible; (2) responsible gambling strategies should primarily target high-risk gamblers; (3) responsible gambling

Table 2. Importance of a sample of responsible gambling guidelines

Guideline ²	Percentage of responses (%) ¹			
	Very important	Somewhat important	Mildly important	Not at all important
Don't borrow money to gamble	88	9	2	1
Use discretionary income, not money for everyday expenses	87	9	3	1
Do not 'chase' losses; accept losses as the cost of entertainment	86	9	3	2
Set a budget and stick to it	83	13	3	1
Do not use cash machines to get more money for gambling than intended	81	14	4	1
Gamble for entertainment, not as a way to make money	75	16	7	2
Balance gambling with other leisure activities	72	18	6	4
Set a time limit and quit when the time is up	67	26	4	3
Know that the risk of problems increases at times of loss or depression	55	33	10	2
Gamble together with friends or family, not alone	35	38	18	9
Take frequent breaks	33	40	21	6

¹N = 171. ²Guidelines listed in descending order based on proportion of 'very important' rating.

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strategies should target all gamblers regardless of risk level, and; (4) low-risk gambling can have benefits for some people. The proportions of 'strongly agree' and 'agree' responses for statements 1 (safe gambling is possible) and 3 (all gamblers should be targeted) were 36% and 44% and 40% and 38% respectively, indicating that the majority of respondents agreed with these assumptions. Canadian experts were more likely to agree or strongly agree that safe gambling is possible compared to American experts (85% vs. 76% respectively), Mann-Whitney $U = 1852.5$, $p < 0.05$. The majority of respondents strongly disagreed (36%) or disagreed (18%) that responsible gambling strategies should primarily target high-risk gamblers. Non-researchers were more likely to disagree or strongly disagree with this statement than researchers (71% vs. 58%, respectively), Mann-Whitney $U = 1862.5$, $p < 0.05$. Although 63% of respondents agreed or strongly agreed that low-risk gambling can have psychological benefits, there was less consensus than the other three items (37% disagreed or were neutral on the issue).

Benefits of Low-risk Gambling

Respondents who felt gambling had some psychological benefits were asked to rate the perceived benefits across six dimensions: reducing stress; socializing; distraction from life's problems; satisfaction from supporting charitable causes; a pleasant form of entertainment; and the excitement and fun of winning. The mean ratings for each of the six dimensions, stratified by respondent type (researchers vs. non-researchers) are depicted in Figure 1. Although the 95% confidence intervals overlapped in all benefit categories, the highest benefit ratings were given to gambling providing consumers with excitement and an outlet for socializing. There was also no difference between US and Canadian experts on ratings of the benefits of gambling.

Low-risk Gambling Limits

The majority of respondents believed low-risk gambling limits were either very (30%) or somewhat (45%) important. No differences were detected between researchers and non-researchers, or between Canadian and US experts, in the ratings of importance.

Ratings of how liberal or conservative the proposed low-risk limits were very close to the midpoint of the scale: frequency (mean = 5.9, SD = 2.2), amount spent (mean = 5.8, SD = 2.3), percentage of gross income spent on gambling (mean = 5.6, SD = 2.3), and duration (mean = 5.0, SD = 2.1). The complete range of ratings by proportion of responses is depicted in Figure 2 for each low-risk limit. Once again, no differences were found between researchers and non-researchers, or between Canadian and American experts, in the ratings ($ps > 0.05$ for all t-test comparisons).

Because it may not be practical to promote low-risk limits across all four gambling parameters, respondents were also asked to rate the importance of each parameter for further investigation and possible dissemination to the public. The percent of gross income spent on gambling limit received the highest proportion of 'very important' ratings (58%), followed by frequency (52%), amount (40%) and duration (35%). These results are graphically depicted in Figure 3. We next explored the relationship between the importance ratings for

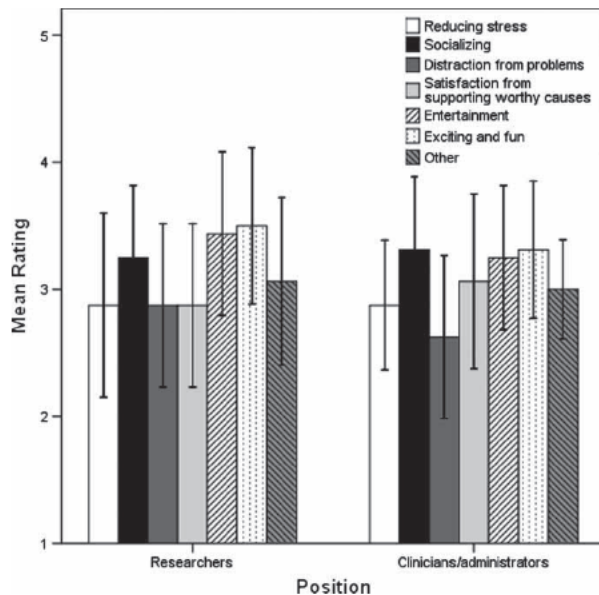


Figure 1. Perceived benefits of low-risk gambling (1 = not at all beneficial; 5 = very beneficial) by primary position of respondents. Mean rating and 95% confidence interval shown.

each low-risk limit and the importance rating for each of the comparable, existing responsible gambling guideline (Table 2). In these analyses, the 'very important' and 'somewhat important' ratings were collapsed, as were the 'mildly important' and 'not at all important' ratings. Chi-square analyses indicated strong correlations existed between respondents' ratings of the quantitative low-risk limits for percentage of income spent on gambling, dollars spent and frequency, and the existing responsible gambling guidelines referring to using only discretionary income to gamble, setting a budget and sticking to it and taking

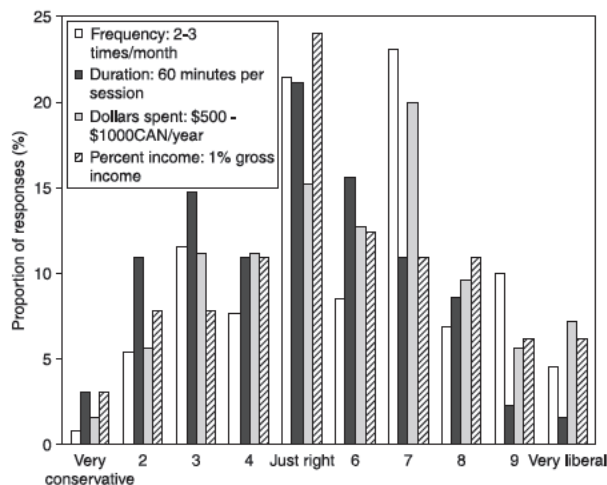


Figure 2. Face validity of proposed low-risk limits

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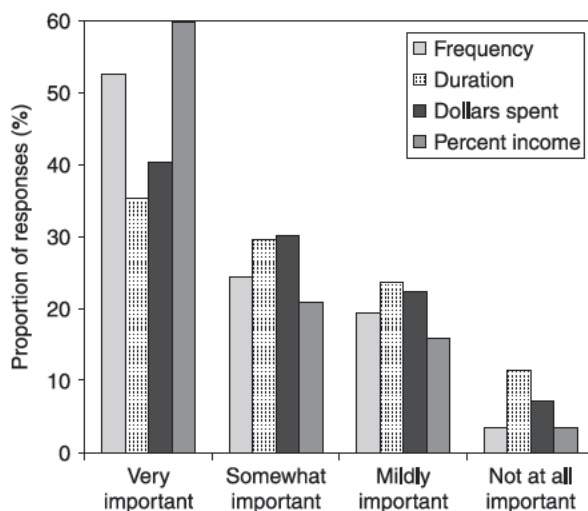


Figure 3. Ratings of the importance of each low-risk limit

frequent breaks. Specifically, 81% of experts who rated the low-risk limit for percentage of income as very or somewhat important also rated advice to use only discretionary income to gamble as very or somewhat important ($\chi^2 = 8.15$; $p < 0.01$); 72% of experts who rated the low-risk limit for dollars spent on gambling as very or somewhat important also rated advice to set a budget and stick to it as very or somewhat important ($\chi^2 = 4.17$; $p < 0.05$). Lastly, 82% of experts who rated the low-risk limit for frequency of gambling as very or somewhat important rated advice to take frequent breaks as very or somewhat important ($\chi^2 = 3.38$; $p < 0.05$). The relationship between the low-risk limit for duration per session and advice to set a time limit and quit when the time is up was not significant ($\chi^2 = 0.95$; $p > 0.05$). Only 67% of experts who rated the low-risk limit for duration as very or somewhat important also rated advice to set a time limit as very or somewhat important.

In terms of the most appropriate label, over half of the sample (52.8%) voted the best label for quantitative limits as 'responsible gambling limits' followed by 'safe gambling limits' (18.1%), and 'low-risk gambling limits' (8.7%).

Lottery and Game-specific Guidelines

Only 23% of respondents felt lottery games should be excluded from the development of low-risk gambling limits. The sample were quite divided in their responses to the item that low-risk limits should be different for each type of gambling – i.e. separate limits for bingo, slot machines etc. The proportions of responses were as follows: strongly agree (17%), agree (29%), neutral (14%), disagree (19%) and strongly disagree (21%). Researchers and non-researchers did not differ in responses to this item ($p > 0.05$) but Canadian experts were more likely to agree or strongly agree to the notion of game-specific guidelines than their American counterparts (58% vs. 38%; Mann-Whitney $U = 1811$, $p < 0.05$).

Analysis of Comments to Open-ended Questions

Most respondents (91%) provided comments to the two open-ended questions: 'What are your concerns about promoting low-risk gambling limits?' and 'Do you have any other comments regarding low-risk gambling limits?' These comments were reviewed independently by three of the investigators and overall themes were extracted based on consensus among all reviewers. Similar themes were extracted from both open-ended questions and, hence, were combined for analysis purposes. Many responses contained more than one theme. The most common themes to emerge were:

Low-risk limits may create a false sense of security (34% of comments). Respondents worried that gamblers adhering to these limits may feel they are safe and impervious to harm. A related concern was that problem gamblers may justify continuing to gamble if they report staying within the limits.

Might promote gambling (34%). Respondents worried that the dissemination of low-risk limits might encourage more people to gamble or abstinent gamblers to resume gambling again.

Low-risk limits should be defined by the specific game (29%). Many respondents felt that games of chance varied considerably and that a universal limit may be practical for one game but unrealistic for another.

Specific limits proposed are not practical (24%). Some respondents felt the proposed limits were either too liberal or too conservative to be of practical value. For example, one respondent felt that a dollar limit of \$500 to \$1,000 per year was unrealistic for high-income occasional gamblers, while three respondents felt that such a dollar limit was too high for persons with a low income. A related comment was that monetary limits should specifically refer to losses.

Low-risk limits need to be qualified with other information (16%). Many respondents felt that low-risk limits on their own would be insufficient to protect the public from harm. A related concern was that low-risk limits will not apply to all populations, most notably problem gamblers.

Public will ignore them (5%). Concern was raised that the limits would have no impact on the public.

A minority of respondents ($n = 29$; 17% of sample) fundamentally disagreed with the concept of a low-risk gambling limit. Respondents who endorsed this opinion were significantly more likely to be clinicians rather than researchers (72% vs. 28%; $\chi^2 = 4.78$; $p < 0.05$) and be based in the US rather than Canada (79% vs. 21%; $\chi^2 = 6.01$; $p < 0.05$). In addition, compared to other respondents, this group was more likely to rate the importance of low-risk gambling as mildly or not at all important (60% vs. 20%; $\chi^2 = 60.92$; $p < 0.001$), and disagree with the statement that safe levels of gambling are possible (40% vs. 17%; $\chi^2 = 6.79$; $p < 0.001$). The main concern voiced by this group was that gambling-related harm needs to be assessed on an individual basis and the application of any threshold limit on gambling behaviour would not prevent harm. Others felt that gambling at any

level was inherently risky and, therefore, the concept of low-risk gambling simply did not exist. A few respondents felt that low-risk gambling limits shifted responsibility to the individual when the gaming industry should be held accountable for creating 'unsafe' gambling environments.

Discussion

In their seminal paper on gambling and public health policy, Korn and Shaffer (1999) identified the need for healthy gambling guidelines that include quantitative betting limits. The current study sought expert opinion on the importance of such low-risk gambling limits and the face validity of empirically-derived thresholds that appear to distinguish low- and high-risk gambling behaviour. Over 80% of the 170 researchers, clinicians and other gambling experts surveyed provided cautious support for the notion of low-risk gambling limits. The majority of experts surveyed indicated that low-risk gambling limits were an important addition to the field of addictions. Support was also high for existing responsible gambling guidelines, although some guidelines were viewed as less important than others. A strong relationship was found between levels of support voiced for the low-risk limits for dollars spent, percentage of income spent on gambling and frequency of gambling and existing responsible gambling guidelines referring to sticking to a budget, using only discretionary income and taking frequent breaks. This finding suggests that experts are at least internally consistent in rating the importance of responsible gambling guidelines and limits referring to the quantitative dimensions of gambling. This relationship did not hold for importance ratings of the low-risk limit for duration of gambling. However, overall support for this low-risk limit was the lowest of the four quantitative dimensions put forward.

Over half of respondents believed low-risk gambling may have psychological benefits, with the socializing and the excitement of winning receiving the highest ratings. Recent research suggests that older adults who gamble at recreational levels report better physical and mental health compared to same-aged non-gamblers (Desai *et al.*, 2004; Loroz, 2004; Shaffer and Korn, 2002; Vander Bilt *et al.*, 2004). In the case of alcohol, low-risk consumption has been found not only to be safe but also to have health benefits for middle-aged men in terms of reducing the risk of cardiovascular disease (Babor *et al.*, 2003). The identification of a similar dose-response curve, depicting health benefits at low levels and toxic effects at high levels, could have important implications for responsible gambling policies. Nonetheless, the nature of this relationship could be more complex than alcohol. For example, experiencing the excitement of winning can predispose some individuals to gamble at higher intensity levels. Needing to gamble with larger amounts to obtain the same level of excitement is a core behavioural symptom of pathological gambling (American Psychiatric Association, 1994).

Preliminary face validity is provided in the present study for the low-risk limits derived from the Currie *et al.* (2006) and Currie *et al.* (2008) analyses. Mean ratings of liberal versus conservative indicated the actual limits proposed appear appropriate. There was no difference in ratings between researchers and non-researchers, or between American and Canadian experts. The latter finding suggests the limits, although derived from a Canadian sample, may also have applicability in the US. In fact, the low-risk limits for duration and percentage

of income spent on gambling used in the present study are very similar to the Weinstock *et al.* (2007) limits that were derived from a US sample of gamblers. Of course, the latter limits are only applicable to pathological gamblers who continued gambling after treatment. The difference in samples (pathological vs. social gamblers) may explain the more conservative limit for frequency (no more than once per month) found by the Weinstock group. However, US general population data bases are also available that can be used to cross-validate the limits to determine their applicability to social and recreational gamblers.

Many survey respondents expressed the need for caution in applying the limits across all forms of gambling. Many of the concerns voiced related to the limitations of the quantitative guidelines. For example, concern was raised that the limits are not practical for all types of gambling (e.g. a limit on duration of session is irrelevant for playing the lottery or buying a raffle ticket), a limitation also voiced by Weinstock *et al.* (2007). The most often cited concern, however, was that low-risk gambling may promote a false sense of security in the public. A related concern was that problem gamblers would use the limits as a means to justify gambling, or the limits would encourage abstinent persons to start gambling. These comments speak to the need to monitor the impact of any low-risk limit on vulnerable populations. One such population is individuals of limited financial means. A dollar limit of \$1,000 per year may be feasible, even conservative, for persons in the middle- to higher-income brackets. For persons on social assistance, this amount could represent a large proportion of disposable income. Variability in financial means was accounted for, in part, by also having a limit for percentage of income spent on gambling. However, a quantitative limit for percentage of income can vary considerably across the full range of income in the general population. Furthermore, an argument can be made that persons with very low incomes should not gamble at all. The other vulnerable populations to consider are problem gamblers and persons at risk for problem gambling. The low-risk limits may encourage these populations to gamble when abstinence would represent the safest approach. On the other hand, the findings of Weinstock *et al.* (2007) suggest that some pathological gamblers following treatment can gamble at low or moderate levels and still maintain a problem-free status.

A small proportion of survey respondents felt the low-risk gambling limits were untenable in any form. Experts endorsing this opinion were overrepresented by clinicians who treat pathological gamblers, with a higher percentage based in the US than Canada. Clinicians are unlikely to see many social or recreational gamblers in their practice; hence they may be predisposed to see all gambling activity as inherently harmful. Nonetheless, the majority of clinicians surveyed felt the concept of low-risk limits held merit. Furthermore, the argument that low-risk gambling does not exist because all gambling is inherently harmful is not empirically supported. Analyses of Canadian gambling surveys (Currie *et al.*, 2006; Ladouceur, 1996; Marshall and Wynne, 2003) and studies conducted in the US (Shaffer *et al.*, 1997) indicate that the majority of social gamblers report no negative consequences.

Several important limitations of this study should be acknowledged. Foremost, the survey response rate (37%) was low. Although researchers, non-researchers, Canadians and Americans responded at comparable rates, it remains possible that the findings would be different if a larger sample of professionals returned the survey. As noted, we chose not to survey professionals outside Canada and the US

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because the actual low-risk limits proposed may have less relevance in other countries. The absence of lay persons in the survey sample is another limitation. In defence of this point, we felt it necessary to first obtain support from gambling experts before surveying the general public. The next logical step is to seek the opinions of gamblers themselves on the feasibility of the proposed limits.

There are several caveats with the low-risk limits themselves. These are discussed in detail in related publications (Currie *et al.*, 2006; Currie *et al.*, 2008). The possibility of underreporting gambling harms and gambling behaviours is a perennial concern with surveys of addictive behaviours (Volberg, 2007). Participants would have little to gain by deliberately providing misleading information to phone interviewers (Weinstock *et al.*, 2007). Nonetheless, self-reported gambling expenditures derived from survey data are known to be underestimates of actual expenditures when they are compared to the per-gambler revenues reported by the gambling industry (Azmier, 2005; Statistics Canada, 2003). The low-risk cut-off for expenditure could be higher if actual rather than self-reported expenditures were used in the calculation. An argument could be still made for basing the low-risk cut-off on self-reported expenditure data because it is the gambler's perception of how much he or she spends that is most relevant for guiding behaviour change.

Finally, although the low-risk limits for gambling share some similarities with the alcohol low-risk limits, their preventative objective is different. Limits on alcohol consumption are intended to prevent acute intoxication and the resulting consequences. There is no gambling equivalent of acute intoxication. Low-risk gambling limits are intended to prevent future psychological, social and financial harm. Chasing losses may be the most salient behavioural indicator of risky gambling (Toce-Gerstein *et al.*, 2003). Avoidance of chasing behaviour is one of the responsible gambling guidelines (see Table 3), but the construction of an actual quantitative limit to guide such behaviour would be extremely challenging.

Our intention in developing the low-risk limits was to augment rather than replace existing responsible gambling strategies. An example set of responsible gambling guidelines that incorporate the quantitative limits is provided in Table 3. To construct this table, the existing guidelines that received very important ratings from more than 50% of the sample were retained. The quantitative limits for frequency, amount spent on gambling and percentage of income spent of gambling are incorporated into these guidelines, but the duration limit was dropped in the light of the low proportion of very important ratings. The concern voiced by many experts that risk level varies by type of gambling was incorporated into a new guideline. Unfortunately, the data are not available to develop separate quantitative limits for each type of gambling. In our analysis of the CCHS 1.2 we found a stronger dose-response relationship for gaming machines and casino games compared to other types of gambling (Currie *et al.*, 2006). However, over two-thirds of the sample engaged in more than one form of gambling so the identification of a quantitative threshold for specific games was impossible. Future epidemiological research should attempt to link harms from gambling with specific types of games. It should be emphasized that these revised guidelines are intended as a sample only and are subject to revision based upon further validation research. The specific limits require further validation with other data sets. Furthermore, the wording and presentation of the guidelines, including their limitations, require additional consultation with gambling experts and consumers. We present this list for discussion purposes only.

Table 3. Sample responsible gambling guidelines incorporating quantitative limits

Preamble: The following guidelines are intended for individuals who choose to gamble to avoid developing problems. These guidelines apply to all forms of gambling (lottery, bingo, casino games, VLTs, poker, sports betting, etc.).

- Don't borrow money to gamble.
- Gamble with discretionary income only, not money for everyday expenses. Limit your gambling expenses to no more than 1%* of your gross income.
- Pursue other leisure activities in addition to gambling.
- Set a gambling budget and stick to it. Limit your gambling expenses to no more than \$1000 per year* (about \$80 per month) or 1% of your income, whichever is lower.
- Do not use cash machines (automated teller machines) in casinos or other gambling venues to get more money for gambling.
- Do not 'chase' losses (that is, make repeated attempts to recover financial losses incurred while gambling); accept losses as the cost of entertainment.
- Gamble for entertainment, not as a way to make money.
- Set a time limit and quit when the time is up. Do not gamble more than 3 times per month*
- Limit your exposure to continuous play games (electronic gaming machines, slot machines), which may carry a higher risk of addiction than other forms of gambling.

*Research shows that gamblers who stay within these limits are less likely to experience problems. Gamble less or not at all if you:

- Have a gambling problem or suspect you have a gambling problem
- Are currently depressed or have a mental illness
- Are experiencing financial difficulties

Finally, the low-risk limits may also have value for population health surveillance purposes. Similar to data on alcohol consumption, knowing the proportion of the population that exceeds monthly low-risk limits is potentially more informative to decision-makers in planning prevention strategies (e.g. limiting access to gambling venues) than prevalence rates of problem gambling or per capita gambling expenditures.

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APPENDIX

Opinion Survey of the Feasibility of Low-Risk Gambling Limits

We are seeking expert opinion on the feasibility of low risk gambling limits to augment existing responsible gambling guidelines. For the purpose of this study, low risk gambling limits would promote a maximum limit on the frequency, duration, and expenditure individuals should invest toward *any gambling activities*. Staying within these limits would be considered low risk in terms of preventing harm (similar to the low risk drinking guidelines). Please note that it is not the intention of this study to develop a final, definitive set of low risk gambling limits. Gambling and gaming research is still in a state of evolution and expansion. The gambling limits proposed here are tentative only and are intended to serve as working guidelines for further research and consideration. Careful peer review and discussion is needed before any low risk gambling limits are widely disseminated to the general public. Your answers will be kept confidential. Only aggregate results will be used.

This project is funded by the Alberta Gaming Research Institute and was approved by the University of Calgary biomedical research ethics committee. Investigators on the project include: Dr Shawn Currie, Dr David Hodgins, Dr JianLi Wang, Dr Nady el Guebaly & Dr. Harold Wynne.

You have three options for returning the survey:

1. Via the web survey form. This can be located at <http://surveys.addictioncentre.ca/gambling/>. You must enter the password **curriesurvey** when prompted.
2. Via e mail to . Email: scurrie@ucalgary.ca
3. Via regular mail to: Shawn R. Currie, Ph.D.

Addiction Centre, Foothills Medical Centre
1403 29th St. NW, Calgary, AB
Canada T2N 2T9

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How important are low risk gambling limits to you?

Very important Somewhat important Mildly important Not at all important

2. a. Rate how much you agree with the following statements (put an 'X' in the appropriate category):

	strongly agree	agree	neutral	disagree	strongly disagree
Safe levels of gambling participation are possible					
Responsible gambling strategies should primarily target high risk gamblers					
Responsible gambling strategies should target all gamblers regardless of risk level					
Low-risk gambling can have psychological benefits for some people					

b. If you agreed with the last statement (low risk gambling can have benefits), please rate how beneficial you believe low risk gambling is psychologically in the following areas:

	Very beneficial			Not at all beneficial	
	5	4	3	2	1
Reducing stress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very beneficial			Not at all beneficial	
	5	4	3	2	1
Socializing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Distraction from life's problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satisfaction from supporting worthy causes (e.g., charitable bingo/lotteries)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is a pleasant form of entertainment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excitement and fun of winning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other. Please specify:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Provided in the table below are the guidelines promoted by the Responsible Gambling Council of Ontario. These guidelines are similar to those disseminated in other provinces and states. For each guideline, rate how important you believe the advice is in the promotion of responsible gambling.

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Gamble for entertainment, not as a way to make money	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Balance gambling with other leisure activities	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Gamble together with friends or family, not alone	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Do not 'chase' losses; accept losses as the cost of entertainment	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Use discretionary income, not money for everyday expenses	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Do not use cash machines to get more money for gambling than intended	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Set a budget and stick to it	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Don't borrow money to gamble	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Set a time limit and quit when the time is up	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Take frequent breaks	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>
Know that the risk of problems increases at times of loss or depression	Very important <input type="checkbox"/>	Somewhat important <input type="checkbox"/>	Mildly important <input type="checkbox"/>	Not at all important <input type="checkbox"/>

4. Concern has been raised that low risk limits are difficult to apply to people whose only form of gambling is the lottery (i.e., weekly national/provincial/state run lotteries and charitable lotteries). For example, one can play the lottery often with little risk of harm. Hence, frequency is not a good indicator of problems in the same way as other forms of gambling. Please indicate ('X') how you feel about the following statements:

	strongly agree	agree	neutral	disagree	strongly disagree
Lottery play should be included in the development of low-risk gambling limits					
Charitable lotteries (raffles and fund-raising tickets with the proceeds going charity) should be included in the definition of gambling.					
The low-risk limits should be different for each type of gambling (i.e., separate limits for lottery, Bingo, slot machines, casino games, etc).					

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The analysis of national survey data by Statistics Canada (Canadian Community Health – Mental Health and Well being, 2002) on the relationship between gambling involvement and risk of harm from gambling suggests the limits below.

- a. We want your opinion of whether, from a practical standpoint, you feel these limits are very liberal, very conservative or just right. Circle or place an 'X' next to your rating.

Parameter	*Low-risk maximum										
Frequency	2-3 times/month	1	2	3	4	5	6	7	8	9	10
		<i>Very conservative</i>			<i>Just right</i>				<i>Very liberal</i>		
Duration	60 minutes per session	1	2	3	4	5	6	7	8	9	10
		<i>Very conservative</i>			<i>Just right</i>				<i>Very liberal</i>		
Dollars spent on gambling	\$500 to \$1000 (CAN) per year [= \$400 to \$800 (US) per year]	1	2	3	4	5	6	7	8	9	10
		<i>Very conservative</i>			<i>Just right</i>				<i>Very liberal</i>		
Percent income	1% gross income	1	2	3	4	5	6	7	8	9	10
		<i>Very conservative</i>			<i>Just right</i>				<i>Very liberal</i>		

*The low risk limit applies to *any type of gambling* (e.g., VLTs, casinos, bingo). Exceeding this limit significantly increases the chance of experiencing gambling related harm (e.g., financial problems, health problems, betting more than can afford to lose, interpersonal difficulties). Note the limit on duration was derived from analysis of provincial survey data on gambling prevalence.

- b. It may not be practical to promote low risk limits across four different dimensions of gambling behaviour (frequency, duration, dollars spent, and percent income). Rate how important you feel each limit would be for further investigation and possible dissemination to the public. Place an 'X' next to your rating.

Frequency	2-3 times/month	Very important	Somewhat important	Mildly important	Not at all important
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Duration	60 minutes per session	Very important	Somewhat important	Mildly important	Not at all important
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dollars spent on gambling	\$500 to \$1000 (CAN) per year (~\$400 to \$800 (US) per year)	Very important	Somewhat important	Mildly important	Not at all important
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percent income	1% gross income	Very important	Somewhat important	Mildly important	Not at all important
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What is the best label for low risk gambling limits for the general public? Check only one

Low risk gambling limits

Safe gambling limits

Responsible gambling limits

Moderate gambling limits

Low risk/moderate gambling limits

Other. Please specify

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7. What are your concerns about promoting low risk gambling limits?
Do you have any other comments regarding low risk gambling limits?

Tell us about yourself:

1. What has been your *primary* position over the last 5 years? (Check only one)

Researcher	<input type="checkbox"/>
Clinician	<input type="checkbox"/>
Clinician-researcher	<input type="checkbox"/>
Administration	<input type="checkbox"/>
Policy maker	<input type="checkbox"/>
Other, specify:	<input type="checkbox"/>

2. What has been your *primary* work setting over the last 5 years?

University	<input type="checkbox"/>
Hospital	<input type="checkbox"/>
Community health/mental health clinic	<input type="checkbox"/>
Addiction treatment program	<input type="checkbox"/>
Government	<input type="checkbox"/>
Other, specify:	<input type="checkbox"/>

3. How many years have you been working in the field of gambling (treatment, research, policy)?

years

4. What is your educational background? (check highest level achieved)

Bachelor degree.	<input type="checkbox"/>
Masters degree	<input type="checkbox"/>
Ph.D.	<input type="checkbox"/>
Medical doctor	<input type="checkbox"/>
Certificate/degree/diploma in addiction counseling	<input type="checkbox"/>
No formal degree/diploma	<input type="checkbox"/>
Other, specify:	<input type="checkbox"/>

5. Where are you based?

Canada	<input type="checkbox"/>
US	<input type="checkbox"/>
Other, specify	<input type="checkbox"/>

6. a. Do you provide clinical services for addicted patients as part of your job?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

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b. If yes, what percent of your time is spent assessing and treating

Gamblers	<input type="text"/>
Alcohol abusers	<input type="text"/>
Drug abusers	<input type="text"/>
Polysubstance abusers	<input type="text"/>

100%

7. In what year were you born?

8. What is your gender?

Male	<input type="text"/>
Female	<input type="text"/>

Thank you for completing this survey!!

If you would like a copy of the results, please provide your e mail address below:

E mail