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Measurement of Prevalence of Youth Problem Gambling In Australia: Report on Review of Literature

Final Report

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Contents

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Executive Summary

In this overview of the measurement of prevalence of youth problem gambling literature commissioned by the Department of Family and Community Services, the researchers have confined the task to a review of instruments for measuring problem gambling prevalence, the application and results of selected prevalence studies and a discussion of methodological considerations. The researchers were invited to present their conclusions or recommendations for the future.

Specifically, in relation to existing prevalence studies on youth problem gambling we able to conclude:

- there is "no gold standard", no single instrument that is better than another; and while the desire of researchers is to establish one internationally accepted gold standard measure, few advances have been made in this regard;
- the use of different instruments and differences in criteria and thresholds leads to quite different prevalence rates even when administered to the same sample. The threshold or cut off can be applied conservatively or liberally, so that "no prevalence estimate exists independent of the criteria used to determine the disorder" (Shaffer). This statement is confirmed in our review of prevalence studies;
- prevalence rates are partially a product of the screening tools used;
- the Productivity Commission noted that "it is difficult to measure problem gambling among populations, and no existing single test instrument is perfect. The Commission used SOGS, self assessment methods and other methods to assess harm and prevalence rates, arguing that " a three way approach is better than relying on a single measure." (6.1);
- based on the review of available screens, if a major national prevalence study were to be undertaken then consideration should be given to the use of DSM-IV-MR-J for adolescents as it has a low reading age that should facilitate accurate responses. It would also be advisable to include a second screening instrument in a self-assessment, paper and pencil exercise and we advise that the SOGS-RA should be included. We advise using two screens with several groups. While there is no gold standard the choice of SOGS-RA and DSM-IV-MR-J are likely to facilitate better international comparisons;
- a longitudinal study where gambling issues are integrated into broader health issues may in fact, be the preferred approach. It is clear that gambling preferences (and opportunities) change with age while high youth prevalence rates do not appear to translate into equally high rates for adults. Documenting changes in preferences would be part of any longitudinal study. Other issues would include: does gambling frequency peak and then decline; need to separate wagering from gambling, ability to test hypotheses in longitudinal study. Time interval is important for measuring rate or prevalence.

A longitudinal study would represent a more comprehensive approach to understanding youth gambling behaviours. It could be incorporated in a much broader study including for example with leisure, health and well-being or substance use surveys. The design of such a study would need to consider the following:

- sample of Year 8-12 secondary students;
- followed up at two year intervals;
- follow up at least three times to ensure that the age range was approximately 13-24 over the life of the study;
- use of two screening instruments included in the survey;
- obtain three snapshots or point in time estimates by applying the two screens at three different intervals;
- survey design capable of obtaining information on changing preferences with age;
- longitudinal study has the potential to capture the impact of changing technologies and up take of new technology for gambling or wagering;
- potential benefit if New Zealand would also be involved to provide international comparison; and
- how to incorporate self-awareness feedback in the design of such a study.

1. Introduction: Youth and Gambling Study

With the expansion of opportunities for gaming and wagering (each are different forms of gambling) including through increased accessibility of electronic gaming machines (EGMs) in hotels and clubs in all jurisdictions except Western Australia, an expansion in the number of casinos, the proliferation of games of chance (sponsored by state governments and private agencies) including, *inter alia,* X-Lotto, Tattslotto, Powerball, Keno, scratch-tickets and Bingo and the development of new distribution channels for gaming and wagering, there is significant interest in the impact of the exposure of young people to opportunities to gamble.

Increasingly, technological developments such as the internet and the mobile telephony (and also, sophisticated video games) provide new or potentially new distribution channels for gambling participation by young people, who it is recognised are more 'technologically savvy and astute' than their parents. Sports bars and 'events based wagering' are increasingly targeted at young people as a distinct market segment. Sportsbetting is said to be favoured by many young people. Digital television is likely to expand opportunities for wagering and events based gambling in the future.

Griffiths (UK: 2000) asserts that adolescent gambling is a major problem in society today. Some forms of gambling are illegal due to the age of the participant, while problem gambling 'appears' to be associated with other risk factors including, *inter alia*, illicit drug taking and alcohol abuse. While overwhelmingly a male phenomenon, the extent of youth gambling is said to be a major concern because of the link to adult problem gambling. In the UK, lotteries, scratchcards and slot machine gambling are reported to be the main forms of adolescent gaming. Very little is known about the propensity of Australian youth to participate in the first two of these, where the purchase of tickets is freely available in newsagents and even less is known about underage poker machine play.

Indeed, relatively little is known in Australia about the extent of participation in all forms of gambling by young people, nor the risk factors that may lead to problem gambling. Up until very recently, while an extensive range of studies point to higher prevalence rates for young people in the 18-30 age group and the risk of life-time gambling problems developed from early exposure to gambling, relatively few studies in Australia have addressed the gambling behaviours of young people. This is surprising given that, empirical studies have consistently argued a positive relationship between alcohol, tobacco, crime and youth gambling. Very little is known about the pattern of experimentation with gambling and, like other forms of youth experimentation whether this declines with maturity.

1.1 Terms of Reference

The Department of Family and Community Services (FaCS) commissioned the South Australian Centre for Economic Studies (hereafter SACES) to conduct a review and report on the literature relating to the measurement of prevalence of youth problem gambling in Australia. In particular, it was requested that the report should include:

- a thorough review of the different methodologies used in any existing prevalence studies on youth problem gambling;

- an analysis of the strengths and weaknesses of the different methodologies, taking into account the differing social and gambling contexts in which youth gambling may take place;
- sufficient distinction made between studies of the different age groups (for example, 15-18 years old and 19-24 years old); and
- recommendations on the issues that an approach or consideration of youth gambling prevalence studies would need to address, and a consideration of the issues involved in developing a national youth gambling prevalence survey of 15-24 year olds.

In relation to the last terms of reference, the focus was on highlighting methodological issues for the future, if more detailed consideration was to be given to any national youth gambling prevalence survey. Thus the question to be examined was concerned with issues of methodology and approach; the consultants were not asked to provide a recommendation on whether such a study should be undertaken.

No length was specified for the report as it was not possible to estimate at the commencement of the task just how 'extensive or limited' the available literature might be. The consultants were requested to provide a draft report and to incorporate subsequent feedback into the final report. A period of one month was available to conduct the literature review and to provide the draft report to FaCS. The final report was to be submitted two weeks after the draft has been approved by FaCS.

1.2 Youth Gambling

A comparative analysis of Australian studies on youth and gambling (let alone comparative analysis of international studies) is extremely difficult including because, the definition of the youth cohort almost inevitably varies for every study. A second concern is that almost all prevalence studies are 'point in time estimates', with varying age cohorts, using different screens and survey methodologies and take place in different social and environmental contexts. International comparisons are especially fraught with danger because of differences in gambling regulations, forms of gambling, access to gambling opportunities and age related factors.

Definitions of the youth cohort include 18 to 30 years of age, 'university attending' students, primary school students, Year 12 students, while a number of studies have involved Year Eight high school students (age range 11 to 13). A recent study of South Australian high school attending students (Delfabbro et al, 2003) sampled surveyed year 10, 11 and 12 students. Interestingly in this study, the authors stated that "most adolescents did not experience gambling related problems. Problem gambling was classified as a score of 4 or higher on the DSM-IV-J. Based on this classification, 3.5 per cent of participants could be categorised as problem gamblers."[1] This is consistent with the lower end of rates for youth problem gambling reported in the North America, Canada and the UK that are reported to range from 3.5 per cent up to 8 per cent.

[1] Delfabbro, P., et al (2003), "The social determinants of youth gambling in South Australian adolescents", *Journal of Adolescents*, Vol. 26. p. 323.

Rossen (2001) for the New Zealand Centre for Gambling Studies reviewed the public health literature on youth gambling, including the range of screening tools used in prevalence based research on adolescent gambling, the wide range of age groups covered said to represent 'youth' and the diversity of research methodologies. Rossen found that "complications arise when comparing findings due to a lack of consensus with regard to factors such as measurement tools (SOGS-RA, DSM-IV-J, MAGS, etc), and methodology (telephone surveys versus school-based surveys). A review of findings of some 40 population based surveys and studies found rates of adolescent:

— lifetime involvement in gambling range from 20.5 per cent to 99 per cent;

— regular involvement in gambling range from 1 per cent to 35.1 per cent; and

— problematic gambling range from 0.9 per cent to 11.2 per cent."[2]

The wide variation in reported rates provides very little basis for policy credibility.

There has been considerable attention directed towards youth and gambling in North America, particularly following the release of the National Gambling Impact Study Commission Report (1999). The Commission considered that gambling by young people was increasing and that more than one million adolescents aged between 12 and 18 years were 'pathological gamblers'. While estimates of the participation rate of young people in gambling activities varies considerably along with the rate of 'problem gambling, there does appear to be unanimity in the Australian and North American literature that those who begin gambling at a relatively young age are at risk of developing lifetime gambling problems.

Shaffer et al (1997) completed meta-analysis of problem gambling prevalence studies in the United States and Canada and examined some 120 studies. They found that 'the status of being young' is a considerable risk factor for disordered gambling. In their meta-analysis Shaffer et al (1997) categorised people as being in one of three categories indicated by Level 1, 2 or 3.

Level 1 described or classified the majority of people who experienced little or no adverse consequence. Level 2 gambling represented a pattern of gambling that is associated with a wide range of adverse reactions or consequences. Level 3 gamblers were those defined as experiencing the most serious consequences, including disordered or problem gambling that satisfies "diagnostic" criteria.

Their review of studies estimated that young people are almost three times more likely than their adult counterparts to evidence a Level 3 gambling disorder during their lifetime and 4.47 times more likely during the past year to experience a Level 3 disorder. Furthermore, 9.45 per cent of youth were estimated to be classified as Level 2 problem gamblers (lifetime prevalence), compared to 3.85 per cent of adults.

Specifically, in regard to juvenile prevalence studies conducted in North America, Jacobs (2000) examined some twenty studies and found support for the view that involvement of middle school and high school age youths in gambling had increased significantly over the last decade and a half, as gambling had become more popular and more

[2] Rossen (2001), "Youth Gambling: A Critical Review of Public Health Literature", p. v.

accessible as a form of entertainment. A profile of juvenile serious gambling related problem groups is provided in Section 3.5. He concluded that this had important implications for policy formulation.

In summary, researchers who have reviewed a large number of prevalence studies conclude that the measurement of prevalence is dependent on the instrument used, the threshold or cut-off levels chosen and the social context in which gambling patterns are learned and gambling problems are formed. There are significant variations in reported prevalence rates which limit the utility of the findings and their relevance for policy purposes.

Notwithstanding, there does seem to be agreement that the participation of young people in gambling activities has increased over the last 10 to 20 years. Whether the higher reported prevalence rates persist into adulthood is a matter for conjecture.

2. Instruments for Measuring Problem Gambling Prevalence

In Section 2 we commence a review of the different instruments for measuring problem gambling prevalence and the adaptations of various screens to measuring youth problem gambling (ToR: 1). Section 3 follows and extends on this discussion to review selected prevalence studies on youth problem gambling (ToR: 2), from a range of countries employing different screens and/or research methods. In both sections we have selected a major representative study using the screen under discussion and provided a boxed summary to highlight characteristics of the study and the screen.

2.1 Testing for Problem Gambling

The most widely used and quoted tests for problem gambling are the South Oaks Gambling Screen developed by Lesieur and Blume (1987) which emphasises the financial implications arising from excessive gambling and DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, 4th edition) which has a 'greater emphasis on psychological aspects of problems such as preoccupation, development of tolerance, irritability, and gambling as an escape." (Productivity. Commission p. 6.17).

While the two screens referred to above are the most widely used, there are many other screens in use for measuring the prevalence of problem gambling. Shaffer et al (1997) in the meta-analysis of problem gambling prevalence studies, states that:

> "We can be confident that the various instruments used in the disordered gambling field measure essentially the same underlying construct. Further, since there is no "gold standard" for the identification of disordered gambling, we cannot determine the absolute accuracy with which any of these instruments identifies the underlying construct of pathological gambling" (p 52).

However, it is not at all certain from the literature "that we can be confident".

While SOGS was designed on the basis of DSM criteria and uses similar terms to clarify status of the gambler (i.e., pathological, compulsive) Orford (2003) maintains that, disagreements about the terms and definitions used "extends to the very conceptualisation of the gambling problem or difficulty which some people experience" (p. 53). Under the original DSM, pathological gambling was an 'impulse control' disorder later to be replaced in the revised version, by items measuring preoccupation or dependence. That is to say, the underlying conceptualisation of the gambling problem changed and is reflected in the revised version of items.

SOGS on the other hand, as noted above, emphasised financial and guilt aspects. A score of 5+ indicated 'probable pathological gambling'.

Due to the growing concern with adolescent gambling behaviour three screens — SOGS-RA, DSM-IV-J and MAGS — have been specifically adapted or developed for adolescent gambling studies. Derevensky (2000) concludes:

> "Each instrument is reported to have its advantages and disadvantages with considerable overlap between measures. Similar to adult instruments the notion of deception (lying), stealing money to support gambling, preoccupations, and chasing losses are common among instruments used for adolescents", p. 231.

In choosing a gambling screen the strengths and weaknesses of each much be weighed against each other. The conclusion is that ultimately there is no 'precise test' of problem gambling principally because problem gambling is a continuum and where you define the cut-off or threshold will be influenced by what the researcher is seeking to measure. Shaffer (1997) compared instruments and the rates derived from different instruments in studies where two or more screens were used. The ratio of estimates within a single study "ranged from 1.02 (quite similar) to 2.83 (quite different) … [suggesting] that the SOGS produces significantly higher estimates of pathological gambling than versions of the DSM criteria", (p. 57).

Thus, the idea of the gambling continuum (rather than the clinical diagnostic pathology approach) has given rise to a multiplicity of categories such as non-gamblers, non-problem gambling, 'those at risk', 'low risk gamblers', non-regular and regular gamblers, moderate and severe problem gamblers, pathological gamblers, Level 0, 1, 2 and 3 gamblers, etc. This arises from the fact that researchers are seeking to measure different prevalence rates. Where the threshold lies between these categories and across the various studies is unclear. What appears to have evolved over time, in the development of new instruments to measure prevalence is that continuum scales have been grafted onto the medical model. Degrees of problem gambling (the continuum approach) are now being estimated using derivations of a medical model that was originally designed to measure pathological gambling.

2.2 A Biopsychosocial Theory of Gambling: A Comprehensive Model[3]

In recent years, there seems to have been a move towards a multifaceted explanation of problem gambling known as the biopsychosocial model (e.g., Griffiths 1999, Blaszczynski 2000, Griffiths & Delfabbro 2001, Sharpe 2002).

Griffiths (1999) stated, "Gambling behaviour is a biopsychosocial process and must therefore be explained in biopsychosocial terms using the best theoretical strands of contemporary psychology, biology and sociology …. It is probable that sociological, psychological, and biological processes are involved in an interactive and complex fashion in its aetiology", (p. 444). Griffiths quite rightly notes that no single, simple explanation will ever be sufficient on its own to explain all cases of gambling.

Sharpe (2002) states that "Evidence now exists that biological, psychological, and social factors are all relevant to the development of problematic levels of gambling", (p. 1). She argues that behavioural, arousal or cognitive theories on their own cannot fully explain the acquisition of gambling behaviour, the development of problematic levels of gambling, and the maintenance of these behaviours to the point where people jeopardise

[3] Drawn from the South Australian Centre for Economic Studies, (Feb 2003) Evaluation of Self-Exclusion Programs in Victoria for the Gambling Research Panel pp .8-14.

important aspects of their lives. Sharpe therefore moves towards a comprehensive, biopsychosocial model of pathological gambling.

Blaszczynski (2000), while examining pathways into pathological gambling, concludes that problem gambling is "the end result of a complex interaction of genetic, biological, psychological and environmental factors", (p. 7). He identified three different pathways into gambling and argued that each type contains different implications for management strategies and treatment interventions.

1. ***The "normal" problem gamblers*** *(A group with no pre-existing psychopathology. May lose transient control over their gambling behaviour, but their disordered gambling can remit spontaneously or with minimal intervention)*:

   This group may need minimal interventions, counselling and support services. Self-help and self-control educational materials as well as self-help groups such as Gamblers Anonymous can be effective. They may resume controlled gambling after intervention.

2. ***The psychologically vulnerable group of gamblers*** *(Gamblers who try to deal with their emotional distress or life's pressures by 'escaping' through gambling)*:

   Blaszczynski (1998) advises that, for this group, "*Abstinence is perhaps the best goal of treatment*" (p 37). In addition, these gamblers can benefit from psycho-therapeutic interventions to resolve internal conflict and deal with anxiety. This could include stress management, problem-solving skills, and strategies to enhance self-esteem.

3. ***Group with biologically based impulses: The impulsive gamblers*** *(Defined by the presence of neurological or neurochemical dysfunction, reflecting features such as impulsivity and attention deficit)*:

   This group require intensive cognitive behavioural interventions aimed at impulse control. Medication can be considered, with a view to reducing impulsivity through its calming effects. Blaszczynski et al., (2001) advised that genetic vulnerability is unlikely to be amenable to harm minimisation strategies. This group may therefore be better off abstaining from gambling while receiving treatment.

While this classification has been contested, and perhaps denotes adult pathways, rather than adolescent pathways, there is broad agreement with the explanation or biopsychological model as advanced by Blaszczynski. This represents a marked shift away from the more limited diagnostic/medical models as reflected in DSM criteria. It also stresses the importance of screening tools that are relevant to the social context in which they are applied.

2.3 South Oaks Gambling Screen (SOGS)

SOGS is a 20-item questionnaire originally developed for use in clinical settings that was designed to evaluate the presence of pathological gambling. It is essentially based on the medical model employing diagnostic criteria to assess pathological gambling. It derived from the various DSM screening instruments, although it emphasises other aspects such as financial impacts of gambling (e.g., borrowing money). The items include questions about returning another day to win back money lost, gambling more than intended, feeling guilty about gambling, being criticised by others over gambling, having difficulty

stopping gambling, and losing time from work because of it. In its original form it used a dichotomous yes/no approach although recent variations of the instrument employ a graded response scale or numbered Likert scales. The respondent is able to indicate a 'degree of relevance' such as often, rarely, never, sometimes, etc.

Lesieur and Blume (1987) based SOGS on DSM-III criteria and 1,616 subjects were involved in its development, from a number of sources but over half were patients with diagnoses of substance abuse and pathological gambling. They found SOGS to be valid, reliable screening instrument for the fast screening of alcoholic, drug-dependent, and other patients for pathological gambling. A refinement of SOGS is the SOGS-R instrument, initially developed to differentiate between inactive and active gamblers. Svensen (undated) comments that "in order to limit the prevalence of problem gambling to those most likely to be currently experiencing problems, instruments such as SOGS-R were devised that question people about their gambling behaviours in the immediate past, generally the past six months in Australian studies,"(p. 7) although twelve months is the usual time found in almost all studies in other countries.

Notwithstanding, since its inception SOGS has been used as a general screening tool. Furthermore, Orford et al (2003) surveyed 7,680 households on their gambling behaviour to test the psychometric properties of SOGS and DSM-IV. SOGS was found to have a reasonably high internal reliability.

Ladouceur et al (2000) recruited 60 adult participants to study their understanding of telephone adapted SOGS items.[4] Participants who scored 5 or more were asked to attend a structured interview in order to measure their understanding of items. In a series of stages items were explained and SOGS given a second time. No respondent understood all of the items. On average participants did not understand 25.8 per cent of the items (27.2 per cent of the non-problem gamblers and 22.2 per cent of the 'probably' pathological gamblers). Significantly, some 23.4 per cent of respondents that were classified as problem gamblers were, when items were later clarified, subsequently categorised as non-problem gamblers illustrating the problem of 'false positives'. None of the non-problem gamblers increased their score enough to be classified as 'probably' pathological gamblers.

Battersby et al (2002) reviewed SOGS with reference to Australian use, describing SOGS as a self-rated screening instrument, based on DSM-III and DSM-IIIR criteria. The authors maintain that establishment of the optimal cut-off point of 5+ to indicate possible pathological gambling appears to have been chosen by "trial and error to provide the least number of false positives and false negatives", (p. 260). They indicate that the problem gambler identified by SOGS in telephone surveys of the general population in the USA is quite different to that defined in the original clinical trials, including Gamblers Anonymous. They suggest that SOGS may not be appropriate in non-clinical populations. More importantly, as with Dickerson (1996) and others, the authors argue that there is no general support for the concept of pathological gambling. "It has not been clearly specified and may not exist", (p. 263).

[4] See discussion of SOGS-RA. In the study referred to here Ladouceur used three survey groups: children, adolescents and adults.

Battersby et al (2002), among others, argue against SOGS being utilised in an Australian context, due to the unique Australian experience. As Dickenson et al (1997) notes

> "The Australian social context not only is typified by a community acceptance of, and participation in, gaming and wagering, but also by broad based preventative and harm minimisation strategies to address problem gambling". (page 28)

It is claimed that the cut-off point of 5+ for SOGS commonly used in Australia leads to high prevalence rates and that this may simply reflect the gambling culture in Australia, compared to the United States and other countries. There have been numerous instances where the cut-off score has been increased from 5+ even up to a score of 10+. The most notable example of this is the national Productivity Commission study, wherein they argue that "SOGS 10+ group have a very similar pattern of SOGS responses to those gamblers who seek help from specialist problem gambling agencies". (6.26). The Commission however, went further to assess measures of harm and stated that there is a strong basis for seeing "SOGS 5+ as a reasonable measure of problem gambling [and that] it is apparent that SOGS 10+ group fails to identify the bulk of people who are experiencing significant problems with their gambling." (6.30) Svensen (undated) asserts that "instead of concluding that Australia had a high prevalence of problem gambling. some Australian researchers argued that Australians should be measured differently to other human beings,"(page 11) and that this axiomatically leads to continual adjustments to the cut-off score used to measure 'problem gambling' behaviour and the rate of prevalence reported by various studies.

Svensen refers to a 'national study in 1991-92 that found current prevalence rates of 6.6 per cent when a 5+ cut-off was used. (page 12). What is clear is that the purpose of the study must be clearly enunciated. If for example, the researchers desires to measure 'severe problem gambling' then a score of 10+ would be justified. If the purpose is to decide on a possible range of interventions then a score of 5+ may be more appropriate. For those gamblers requiring specific counselling and intervention, a score of 10+ would be more appropriate then a lower score.

While Dickerson et al (1996) have argued that a score of 5+ would lead to 6 per cent prevalence rate, and that this over-estimates the prevalence of problem gambling in Australia, there is no clear reason why either Dickerson, the Productivity Commission or any other researcher could support a 10+ SOGS score for problem gambling over a 5+ score. It is not a valid procedure to relate a 10+ score with ratings for those who attend gambling counselling and to then argue that (because the two groups are similar) this is an appropriate cut-off threshold because the 'attendees' are obviously problem gamblers. One reason is that less than 5 per cent of problem gamblers report for any treatment. We do not know whether they are the most seriously affected or not. Battersby concludes that SOGS is an inappropriate instrument to use in prevalence surveys. Where you pick the cut off score is then reflected in the prevalence rate. Most importantly, Battersby states

> "The SOGS was designed as a screening tool to detect potential 'cases' which would then require further clinical assessment. This has been ignored in the reporting of prevalence studies where there is no clinical assessment, yet claims are made as to the prevalence rate of 'pathological gamblers' in the population studied", (p. 267).

Battersby (2002) suggests an alternative approach is to use the preferred term 'problem gambling' and employ a screening instrument such as the Victorian Gambling Screen (VGS) to measure harm to individuals, their family and to the community. The researchers have no evidence that such a screen has been applied to the adolescent population.

AUTHOR:	Lesieur and Blume (1987)
COUNTRY:	USA
METHODOLOGY:	Originally conducted in psychiatric hospital for alcoholism and drug dependency and treatment of pathological gambling. Survey and interview; supported by information from family/others who were also interviewed. Tested on GA group, students, 1,616 subjects involved in development.
SCREEN/MODEL::	SOGS pathological gamblers 5+
STRENGTHS:	Is the most widely used screen and has a high internal reliability. Able to be used by non-professional in non-clinical setting.
WEAKNESSES:	On average over 25 per cent respondents did not understand over a quarter of items and its true sensitivity in the general population is unknown.

2.4 South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA)

SOGS-RA is a revised version of SOGS developed in order to more accurately assess adolescent gambling problems. It is a 16-item scale (although only 12 items are scored) that assesses gambling behaviours and gambling related problems during the past 12 months. The South Oaks Gambling Screen (and its variations) is one of the most frequently used instruments to assess problem gambling both in adults and in youth, and to provide general population estimates (Wiebe et al, 2000). Rossen (2001) claims that SOGS-RA "remains the most widely utilised adolescent gambling screen, particularly in surveys throughout America and Canada", (p. 4).

SOGS-RA scaled items assess negative behaviours and feelings as a result of gambling involvement. The items include lying about gambling, gambling more than planned, conflict with family and friends and borrowing/stealing to gamble in the last twelve months.

Using this screen, there are three levels of severity: no problem gambling, at-risk gambling and problem gambling. No problem gambling is a SOGS-RA score of zero to one. At-risk gambling is a SOGS-RA total score 2-3. Finally, problem gambling is defined as a SOGS-RA score of four or more. These scores represent the narrow definition of gambling severity as developed by Winters (1995). A broader definition has also been developed (see Poulin, 2000) to account for gambling patterns. Specifically, the broader definition combines gambling frequency and the SOGS-RA score. Under the broader definition problem gambling (as the highest level) consists of SOGS-RA score of 2 or more combined with weekly gambling or "daily gambling regardless of the SOGS-RA score".

Winters et al (1993) developed SOGS-RA for use with older adolescents (ages 15 to 18). In the original study both a telephone interview and in-school survey were utilised. They found no significant differences between the two samples with respect to demographics, disclosure rates for questions pertaining to gambling behaviour and to

other problem behaviours. Their study results demonstrated that the scale had moderate internal consistency, reliability and was significantly related to alternate measures of problem severity for male subjects. Because the rate and severity of gambling among females is very low, the psychometric properties could not be determined for females.

In assessing SOGS-RA, Wiebe et al (2000) suggests that items do not appear to equally contribute to the total score. If some items are better indicators of problem gambling, it is possible that these items should be more heavily weighed. The researchers concluded that there may be important differences in what items are endorsed by problem gamblers compared to non-problem gamblers.

Ladouceur et al (2000) conducted an analysis of SOGS-RA using children in the age range 9 to 12 years and discovered, that on average, children did not understand 26.7 per cent of the items. In a second study of 587 high school students only 30.8 per cent of the students understood all of the items correctly after being invited to complete the SOGS-RA. Following clarification of misunderstood items the SOGS-RA scores decreased for this group by 29.4 per cent again highlighting the problem of "false positives". Clearly, clarification procedures can have a marked impact on the validity of the screen.

Ladouceur et al (2000) then examined how well SOGS-RA items were understood by a group of adolescents in grade 9 to grade 11. Only 30.8 per cent of the 126 students understood all of the items correctly. On average, the participants did not understand 11.7 per cent of the time. No significant differences were found for grades. With respect to changes in scores for the SOGS-RA following a clarification of misunderstood items, the SOGS-RA scores decreased by 29.4 per cent. Furthermore, when the items of the instrument were clearly understood, the number of problem or probably pathological gambling is 41.8 per cent less than the initial figure revealed. One reason for this could be that the interviewers could have created the impression that the respondents should adopt a more conservative approach to answering the questionnaire items.

AUTHOR:	Poulin (1998)
COUNTRY:	4 Atlantic Provinces, Canada
METHODOLOGY:	Survey, 13,549 students in junior and high school, self reported questionnaire included in survey of students and substance abuse.
SCREEN/MODEL:	SOGS-RA: problem gambling 4+
STRENGTHS:	Reliability and construct validity, internally consistent, discriminated between status of gambling activity.
WEAKNESSES:	Criterion validity (i.e., measure traditionally or consensually accepted in the field) has not been demonstrated so uncertainty as to whether definitions and cut-off scores applied to adults can be applied to youth. Cut-off scores could be gender specific.

Another criticism of the SOGS-RA is its lack of questions addressing preoccupation with gambling (Rossen, 2001). Derevensky and Gupta (2000) argue that preoccupation is a necessary element of any gambling screen for the following reasons: it is a criteria central to all addictions, as defined by the DSM-IV; and, their clinical experience has consistently demonstrated it to be relevant to adolescent populations.

2.5 The Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)

The basis of this model used extensively throughout the United States and several other countries is the 'medical model' where problem or pathological gambling is understood as a psychiatric disorder. The model seeks to understand problem gambling as the result of 'individual pathology' (i.e. meeting certain criteria) and then these criteria are used to measure prevalence of problem gambling. Supporters of this approach include Gamblers Anonymous, psychiatrists and most obviously, the gambling industry itself. This model tends to ignore the manner in which the broader economic, familial, social and cultural environment may influence attitudes and propensity to gamble and the intensity of gambling behaviour.

The DSM-IV model has been questioned particularly by Australian researchers including Blaszczynski, Dickerson, Woolley, McMillen and Delfabbro and others who embrace a more multiple faceted explanation of problem gambling which may arise as the result of social, psychological, economic, environmental and behavioural factors. Australian researchers appear to share a common view that 'problem gambling' is a multi-faceted in origin although individual researchers may emphasise one aspect over another.

Rossen (2001) argues that despite general consensus that gambling behaviour lies on a continuum, diagnostic tools endorse the assumptions from an underlying disease model. Screens are mostly made up of items that require yes/no answers. The exception to this is DSM-IV-MR-J (see discussion 2.6).

It is important to note that although adaptations of the DSM-IV has been used to measure the numbers of problem gamblers in adolescents, DSM-IV itself is not a screening tool, and has not been designed as such, but is a set of clinical criteria. It shares many features of the SOGS, but has a greater emphasis on the psychological aspects of problem gambling, such as preoccupation, development of tolerance, irritability, and gambling as an escape (Productivity Commission, 1999). It measures the concept of pathological gambling.

2.6 The Diagnostic Statistical Manual-IV-Multiple-Response-Adapted for Juveniles (DSM-IV-MR-J)

The DSM-IV-MR-J was developed by Fisher (2000) for adolescents who have gambled in the last year and was a variation on Diagnostic Statistical Manual-IV Adapted for Juveniles (DSM-IV-J). DSM-IV-J was based on the adult diagnostic criteria for pathological gambling as defined by the American Psychological Association. It was adapted to measure past year gambling among 11 to 16 year olds via a questionnaire administered in a classroom setting (Fisher, 2000). The questionnaire consisted of 12 items with yes/no response. Fisher (2000) found that four positive responses were enough to categorise respondents as 'probable pathological gamblers'.

DSM-IV-MR-J addresses the appropriateness of yes/no responses in non-clinical situations. As many prevalence studies do not have the opportunity for further probing, most of the questions in the revised instrument have been given four response options: 'never,' 'once or twice,' 'sometimes' or 'often'. These revisions also lead to there being

nine items. The screening test's readability was computed using the Flesch-Kincaid Grade Level Test that provides a score based on the average number of syllables per word and the average number of words per sentence. The score indicates a grade-equivalent level. The test has a score of 4.8 and is therefore at a high fourth grade reading level.

Fisher (2000) explored psychometric data on respondents who were fruit machine players. She found that internal consistency reliability was acceptable for a scale of this size.[5] Survey results also demonstrated that there were no weak items as all of the items discriminated extremely effectively between the problem gamblers and non-problem gamblers. More males were problem gamblers than females and therefore more likely to endorse items. Interestingly, Year 8 respondents (12-13 years) were more likely to endorse all the items than the Year 10 respondent (14-15 years). However, there was no significant difference between the age groups in the proportions categorised as problem gamblers. Furthermore, highly significant mean score differences between regular and non-regular fruit machine gamblers on DSM-IV-MR-J provide evidence of construct validity for the scale. However, this revised screen has not been fully validated.

The strengths of DSM-IV-MR-J is that it has been found that internal consistency reliability is reasonable, all items are discriminatory, construct validity is reliable, it is also a variation of an existing screen and it has a very low reading age. The weaknesses are that it has not fully validated and has not been used extensively or in large scale samples.

No Studies cited	
SCREEN/MODEL:	DSM-IV-MR-J; provides for greater range of options in responding than simple yes/no.
STRENGTHS:	Readable, reliable, internally consistent and good discrimination ability, construct validity high so overall some support for use with adolescent group 12-18 years.
WEAKNESSES:	No evidence of screen being used in large scale study. The researchers unsure about screen's sensitivity to gender.

2.7 SOGS-RA, DSM-IV-J and GA20

Derevensky and Gupta (2000) examined the gambling behaviour of 980 adolescents who were administered three screening measures used with adolescents: SOGS-RA, DSM-IV-J, and the GA 20 questions. All participants were attending junior college and were given a questionnaire during regular class time assessing their past and present gambling history. The questionnaire included the DSM-IV-J, SOGS-RA, and GA20 with instruments presented in random order. They found that DSM-IV-J was found to be the most conservative measure defining 3.4 per cent of the population as problem/pathological gamblers while the SOGS-RA identified 5.3 per cent and the GA Questions identified 6 per cent of youth as experiencing serious gambling problems. It is interesting to note that SOGS-RA found that largest number of males (11 per cent) and the GA20 the largest number of females (3.5 per cent) as probable pathological gamblers. Of particular interest is the finding that scores for female populations exhibit greater variance according to the utilised screen than those for male populations. The

[5] See Appendix A for terminology and measures used to assess the utility of screens.

researchers also note the variation across the three screens from the same sample: 3.4 per cent up to 6 per cent. Therefore, prevalence rates are partially a product of the screening tool used.

2.8 Gamblers Anonymous Twenty Questions (GA-20)

Ursua and Uribelarrea (1998) tested the Spanish version of the GA 20. The results of 127 problem gamblers presenting for treatment of two self-help associations of Madrid were compared to 142 participants who were social gamblers. The social gamblers were paired with the pathological gamblers for the variables of age and sex. GA20 was found to strongly correlate with SOGS. GA20 had high discriminatory validity; hence the questionnaire differentiates between problem gamblers and social gamblers. Ursua and Uribelarrea concluded that GA20 is a good screening instrument, with high reliability and validity, has a coherent unidimensional structure, had high discriminative power and diagnostic efficacy.

The authors claim that the discrimination power of the GA20 is a major strength, and that the GA20 identifies the largest number of pathological gambling adolescents when compared with the SOGS-RA and DSM-IV-J. They go further to state that GA 20 "is as good as the best clinical and diagnostic instruments proposed at present" (page 11). They also conclude that GA20 seemed to produce less false positives[6] than SOGS. Neighbors et al (2002) also reported that as part of their study on 560 undergraduate college students GA20 was moderately correlated with SOGS (correlated 0.55).

AUTHOR:	Ursua, M. and Uribelarrea (1998).
COUNTRY:	Spain.
METHODOLOGY:	Comparison of problem gamblers (R=127) in treatment with N=142 social gamblers.
SCREEN/MODEL:	GA twenty questions.
STRENGTHS:	High reliability (for internal consistency), high convergent validity and correlation with SOGS rated as very high, discriminating ability also high (i.e., discriminate between problem and social gamblers).
WEAKNESSES:	Not discussed.

One possibility arising from the discussion of SOGS-RA and GA20 in regard to their usefulness in identifying youth experiencing gambling problems, would be to use SOGS-RA and GA-20 concurrently across the total sample and to compare the results of the two screens.

2.9 Massachusetts Gambling Screen (MAGS)

The Massachusetts Gambling Screen (MAGS) was originally developed to "assess the biological, psychological and social problems associated with excessive gambling in people who may or may not be in treatment."[7] It is a 26 item scale survey screening instrument incorporating DSM-IV criteria designed to predict pathological gambling in the general adolescent population. Initially tested on 856 high school students the

[6] A *false positive* refers to the results of the test score, whereby someone is falsely classified as a problem gambler. Conversely, a *false negative* is where a problem gambler is indicated as a non-problem gambler.

[7] Youth Gambling: Centre for Gambling Studies, Auckland p. 7.

general consensus of peer reviews we have cited indicate MAGS to be a reliable, valid and effective (i.e., can identify those at risk of pathological gambling) clinical instrument. The explanation for the more limited use of the MAGS screen for measuring problem gambling is that it relies on a binary response (yes/no) for all but one question (although several other screens do likewise), while the classification of respondents into pathological, in transition or non-pathological gamblers is clearly based within the individual, pathology based paradigm (i.e., the medical/disease/DSM-IV model). This is despite the claim that the screen purports to measure social factors as an explanation for problem gambling.

Derevensky (2000) concludes that MAGS is an effective screening instrument for adolescent pathological gambling, "showing a 96 per cent agreement with DSM-IV classification system. The MAGS therefore may be the measure of choice for future research efforts with adolescents although it seems unclear as to the benefits of selecting the MAGS, which is modelled so closely upon the DSM-IV, instead of using the DSM-IV criteria itself", (p. 247).

2.10 The Canadian Problem Gambling Index

The CPGI was developed because of concerns relating to the use of SOGS and DSM-IV manual diagnostic criteria for pathological gambling to determine prevalence within the general population. Intended for use across the general population, the CPGI includes consideration of broader environmental and social factors.

The Centre for Gambling Research (ANU) describes the composition of the CPGI to include four different sections:

- "a detailed measurement of respondents' involvement in various forms of gambling;
- the assessment of problem gambling;
- an evaluation of correlates of problem gambling (e.g., family history, alcohol or drug use); and
- demographic variables" (CGR p20).

Scale responses are used to classify or group into the following categorisation:

- 0 = non-problem gambling;
- 1-2 = low risk;
- 3-7 = moderate risk;
- 8+ = problem gambling.

In commenting on validation of the CPGI the researchers note that "the validation of the CPGI was to a large degree based on DSM and SOGS as reference standards, even though their underlying model of pathological gambling was rejected. Further evidence for the measurement qualities of the CPGI is desirable."[8] However, users of CPGI in

[8] Centre for Gambling Research (ANU) Validation of the Victorian Gambling Screen, October 2003 Draft Report p. 20.

Canada assert that the "CPGI is thought to be a more precise measure of problem gambling behaviour among non-clinical populations". [9] It was tested prior to its use in community based surveys and was found to have well established psychometric properties.

2.11 The Victorian Gambling Screen

Arising from concerns that existing models of problem gambling and their associated gambling screens (SOGS, SOGS-R, DMV-IV, etc) focussed too heavily on pathological gambling and thus were considered to not be appropriate for the Australian situation, the Victorian Casino and Gambling Authority commissioned Flinders Technologies to design a new problem gambling screen. The Victorian Gambling Screen (VGS) was designed and has recently been tested in a study conducted by the Centre for Gambling Research (ANU).[10]

The VGS includes 21 items covering enjoyment derived from gambling (three items), harm to self (fifteen items) and harm to partner (three items), but surprisingly excludes harm to others. These three classifications to account for the 21 questions were developed following focus group discussions with regular and problems gamblers in treatment in Victoria. A pilot validation study was conducted with 239 gambling respondents and we understand, then included detailed interviews with approximately one-third of respondents. To our knowledge the VGS has not been trialled on a much larger sample.

In the next section we consider various studies that have used some of these screens to research adolescent gambling.

[9] Smith, G., et al, "Measuring Gambling and Problem Gambling in Alberta, p. 9.

[10] Centre for Gambling Research (ANU) Validation of the Victorian Gambling Screen, October 2003 Draft Report.

3. Prevalence Studies

In this section we examine selected prevalence studies that emphasise adolescent gambling and the use of relevant screening tools. There is a plethora of prevalence studies — far too many to cover in this limited review — so the researchers have endeavoured to select representative studies from different countries, for different age ranges and to reflect the use of different screens.

3.1 England and Wales

The British Gambling Prevalence Survey involved interviews and self-report questionnaires with some 7,680 respondents to ascertain the current (last 12 months) prevalence rate. For our purposes the point of interest here is that both SOGS and DSM-IV were used together in the national prevalence survey. Orford et al (2003) concluded on the basis of the use of the two screens that:

- 'no single existing screening questionnaire adequately reflects the multi-dimensional nature of problem gambling' (p. 53);
- there needs to be agreement on threshold levels as to what constitutes a problem gambler (e.g., witness use of 5+, 10+ in SOGS);
- transferability to other countries and cultures 'derives from a simple view of problem gambling as a mental disorder' (p. 63).

It is suggested relatively consistently in regard to SOGS and DSM-IV that they continue to measure two different facets of problem gambling, principally dependence (DSM-IV) and gambling related problems such as financial stress, preoccupation with gambling (SOGS).

Fisher (2000) used and developed the Revised Diagnostic Statistical Manual Adapted for Juveniles (DSM-IV-MR-J). Two pilot studies, amounting to 80 completed questionnaires, were conducted to fine-tune the contents of the questionnaire. The final sample included 9,774 students at high schools in England and Wales, both Year 8 (12-13 years) and Year 10 (14-15 years). The study found that 5.6 per cent scored in the problem gambling range of DSM-IV-MR-J. The particular emphasis of this study was on players of fruit machines and National Lottery Scratch Cards as these games were causing the most public concern.

Griffiths (2000) reports that 6 per cent of adolescents may have patterns of problem gambling on UK lotteries, on scratchcard gambling and between 0.5 and 6.0 per cent probable pathological gambling on slot machines based on the DSM-IV-J. It is also argued that electronic cash, the structure of video games and internet gambling are increasingly risk factors for young people. Because 16 is the legal age for gambling in the UK an additional factor is that young people commence gambling earlier. Different social norms highlight the risk of simply transferring results from one country to another. The high prevalence rates and the younger legal age to commence gambling contests the assertion of some that Australia has a more entrenched gambling culture than other nations.

Wood, Griffiths, Derevensky and Gupta (2002) conducted research with adolescents aged 11 to 15 years using Q-cards to understand rather than measure young people's behaviour in regard to the UK national lottery and scratchcards. The process involved scaled rating of agreement/disagreement with statements leading to attitudinal positions, viewpoints or perceptions. The strength or utility of Q-sorts is that it can help to understand "the views of gamblers and non-gamblers alike", to test questions/responses, develop new types of hypothesis and may be used in behavioural counselling.

AUTHOR:	Wood, R.T.A., Griffiths, M., Derevensky, J., and Gupta, R., (2002).
COUNTRY:	UK.
METHODOLOGY:	Adolescents 11-15 years (N=62), Q-cards/Q-sorts which are statements on 49 cards taken from screens (e.g., DSM-IV-J), from prevalence studies to test attitudinal dimensions to statements.
SCREEN/MODEL:	Matrix of card responses to make choices about statements; potentially useful tool to help frame prevalence studies, test understanding of questions.
STRENGTHS:	Designed to also reflect social context in which youth experience gambling issues; and to assess attitudes. Procedural tool for qualitative research.
WEAKNESSES:	N/A.

3.2 Canada[11]: Manitoba

Wiebe et al (2000) examined the gambling behaviour of Manitoba youth using SOGS-RA. Study participants were part of a province-wide telephone survey of 1,000 youth between the ages of 12 and 17. Households were randomly selected from a listed sample; controls were used to ensure representation by region, gender and age. One thousand four hundred and forty (1,440) households were identified containing an eligible youth, 214 parents refused to allow their child to participate, 217 youth were unwilling to participate, 9 youth ended the survey during the course of the actual interview, with a thousand youth completing the survey.

The SOGS-RA categorised the adolescents into four categories:

- non-gambling: youths: who had not gambled in the last year;
- non-problem gambling: defined as scores of 0 and 1;
- at-risk gambling; individuals had scores of 2 and 3; and
- problem gambling: based on scores of 4 or greater.

Wiebe et al (2000) reported that 8 per cent of the total sample could be classified as 'at-risk' for problems, and 3.2 per cent classified as having severe gambling related problems.

[11] See Appendix B for Table summary of Canadian Problem Gambling Prevalence Surveys.

AUTHOR:	Wiebe et al (2000).
COUNTRY:	Manitoba, Canada.
METHODOLOGY:	1,000 youth, aged between 12 and 17 years, random survey of households seeking parental consent to participate. Telephone survey.
SCREEN/MODEL:	SOGS-RA: problem gambling 4+.
STRENGTHS:	Invariant across gender, internal consistency.
WEAKNESSES:	Author considers that clinical interviews required to test sensitivity of screen. Some items require rewording to reduce over and under endorsement.

3.3 Canada: Atlantic Provinces

Poulin (2000) undertook a survey to determine the prevalence of gambling among adolescent students in the Atlantic provinces of Canada. In 1998, a total of 13,549 students in grades 7, 9, 10 and 12 in the public school systems of the four Atlantic provinces completed a self-reported anonymous questionnaire that included SOGS-RA. A response rate of approximately 98 per cent of students present on the day of survey, and approximately 13 per cent of students were absent on the day of survey. Poulin gives both prevalence estimates using the standard narrow SOGS-RA score totals (explained under SOGS-RA: Section 2.4) and a broader definition. The broader definition is as follows:

> No problem gambling: No gambling activity: or, Gambling less than daily and SOGS-RA score =0
>
> At-risk gambling: Weekly gambling and SOGS-RA score = 1; or, Gambling less than weekly and SOGS-RA score of > or = 1.
>
> Problem Gambling: Daily gambling regardless of the SOGS-RA score; or, Weekly gambling and a SOGS-RA score > or = 2.

Poulin (2000) found that 8.2 percent and 6.4 per cent of adolescent students met the broad definition of at-risk and problem gambling, respectively. Furthermore, approximately, 3.8 per cent and 2.2 per cent of adolescent students met the narrow definition of at-risk and problem gambling, respectively.

3.4 Canada: Quebec

In one of the very few longitudinal studies incorporating gambling issues, Vitaro (2001) used a "French version of SOGS-RA to assess gambling behaviour and gambling related problems" involving 717 French-speaking male Caucasians from disadvantaged neighbourhoods in Montreal, Quebec. They sought to relate results of measures collected (impulsivity, status of friends and parental supervision) when the respondent males were aged 13 and 14 years to measures of gambling frequency and gambling problems with delinquency and drug/alcohol use when the boys were aged 16 and at 17 years. The study sought to establish predictive relationships.

While at age 17 years, the study found gambling behaviour did not explain any increase in delinquency or substance use, it did find a concurrent association between gambling, delinquency and substance use. The study concluded that the three risks factors at age

13/14 years helped to predict behaviours at 16/17 years, suggesting some underlying, common risk-factors.

3.5 North America

Jacob (2000) reviewed 20 juvenile gambling prevalence studies in the USA conducted in the period 1984-1999 in both the USA and Canada and concluded that there is "little doubt that juvenile gambling has increased significantly" over this time frame, with the medium level of participation rising from 45 per cent to 66 per cent. A significant issue with this account is that all forms of gambling are lumped together (illegal and legal based on age). Wagering with peers or a "side-bet on the outcome of a game of pool between two players" is not the same as illegal entry and play in a hotel, club, or casino. Playing the stock market is equated with buying a raffle ticket. While this approach is consistent with gambling viewed as a "continuum of activities" studies rarely inform how much is gambled, the source of income, extent of illegal access/behaviour, etc..

Jacob (2000) provides a composite profile of juvenile "serious gambling related problem (SGRP) groups":

- early age onset (before age 12);
- boys more likely to experience problems;
- parents gamble, or family gambling pattern;
- more likely to live in metropolitan rather than regional/rural areas;
- few studies on ethnic group membership, although Native American youth identified;[12]
- games played are continuous and interactive (as for adults) such as poker, games of personal skill, sports betting and EGMs;
- sources of money: from lunch money through to stealing (but rarely are amounts provided by activity);
- frequent gamblers "more likely" to be involved with heavy use of alcohol and drugs, report more truancy, and poorer school performance; and
- high level of dissociative reactions while gambling and varied motives and psychological states reported for gambling.

Young people over the age of eighteen have been usually surveyed with all adults except for the case of college students that have a number of studies dedicated to them. An example of this is Neighbors et al (2002) that undertook a study on US undergraduate college students. Approximately 560 college students were surveyed using a number of different screening tools. It was found, using SOGS that 83.9 per cent of participants gambled non-problematically (SOGS score less than three), 9.8 per cent of participants were sub-clinical problem gamblers (SOGS score three or four) and 6.3 per cent were probable pathological gamblers (SOGS scores of five and higher).

[12] This should not be a surprise given special exemptions and number of casinos on Native American lands.

Neighbors et al also developed a new screening tool for measuring problem gambling prevalence called The Gambling Problem Index (GPI). It is a 20-item questionnaire and for each item respondents are asked to indicate on a five point scale (never, one to two, three to five, six to ten, and more than ten times), how many times during the previous six months they experienced a negative consequence while gambling or as a result of gambling. The GPI score is calculated as the sum of items in which respondents indicated experiencing the gambling related consequence, at least once, during the previous six months. They found that it correlated moderately well with SOGS (0.42) and GA20 (0.52). However, the authors give no indication of what constitutes problem gambling with this measure. This means that it is very difficult to evaluate its use as a screening tool. The GPI is perhaps best understood as an "outcome measure" to be used to inform the participant of the consequences of gambling and through raising awareness, assist with intervention and treatment.

Winters et al (1993) initially trialled the SOGS-RA to assess the gambling experience of adolescents in the 15-18 age group. The authors reported a problem gambling rate of 8.7 per cent, although the sample was not representative of American youth. The study was one of the first studies to discuss the correlates of problem gambling which included problems with academic performance, drug use, parental gambling and exposure to gambling. The survey was inconclusive on rates of gambling by females. The authors also place in context, the experimental nature of most adolescent gambling: ' infrequent pattern, a low amount of money spent, and absence of problem signs and symptoms', while adolescent gamblers prefer skill based gambling' (sporting events), and low impact forms such as cards, bingo and scratch cards.

AUTHOR:	Winters et al (1993).
COUNTRY:	Minnesota, USA.
METHODOLOGY:	1,101 adolescents aged 15-18 years, with two-thirds interviewed by telephone, one third from high school (grades 10-12).
SCREEN/MODEL:	SOGS-RA Modified SOGS for adolescents, tested alongside statewide adult survey using SOGS.
STRENGTHS:	Screen showed internal consistency, reliability and factor analysis of individual items showed a common dimension.
WEAKNESSES:	Preliminary study, limited sampling with focus on 'white male adolescents', concern that reliability and validity for females was inadequate.

In a large study of Minnesota public school students, Stinchfield (2000) examined the prevalence of gambling using a self-administered questionnaire (see Box). Using a very large sample, gambling questions were included with an Education Department administered alcohol and drug risk survey. The primary findings included that males gambled more frequently than females (8 times greater), that most students did not gamble on a weekly/daily basis and that the gambling activity undertaken changes with age as access patterns change. Consistent with other research findings, young people report that it is very easy to purchase lottery tickets, scratchcards either directly themselves or by family members.

AUTHOR:	Stinchfield, R., (2000).
COUNTRY:	Minnesota, USA.
METHODOLOGY:	Included 5 gambling frequency questions and two problem gambling items in a self-administered 121 item paper and pencil questionnaire which dealt with alcohol and drug use. Sample was 78,582 9th to 12th grade students aged 14-20 years at high school.
SCREEN/MODEL:	Not a gambling screen but gambling questions included in broader survey. Administered in class room setting.
STRENGTHS:	Can be undertaken across a school system, very large sample and provides for more accurate measurement, does not require sample to population inference.
WEAKNESSES:	Restricted to those attending school, may contain self-report bias and not concerned only with gambling behaviour.

One of the benefits of this type of approach is that it is known that gambling, drug and alcohol use are associated at least in the stage of adolescent experimentation. Whether this overlap continues into adulthood is still strongly debated.

One extension of the Stinchfield study compared rates of gambling among the same Minnesota student cohort in 1992, 1995 and again in 1998. While the survey was not intended as a comprehensive review of gambling behaviour it found that fewer students gambled in 1998 than in 1992. This finding goes against the reported rise in patterns of youth gambling over this time period. The benefit of this longitudinal study compared with the myriad "of point in time studies", using different methodologies and across different age groups (which does restrict the ability to compare gambling rates) is that changes in youth gambling can be compared over time. Stinchfield (2001) refers to four studies that specifically examined the question of changes in youth gambling over time and reported "the predominant findings were stability and some slight declines in the number of frequent gamblers" (p. 276). As youths get older, gambler preferences change from informal gaming activities to legalised activities.

3.6 Australia

As part of an Australian study on a model for predicting adolescent gambling frequency and problem gambling, Moore and Ohtsuka (1997) examined problem gambling prevalence among young people aged between 14 and 25 years. Participants were volunteers from Years 10, 11 and 12 of six secondary schools and first year undergraduates from four geographically separate campuses of a university in Melbourne. The university and the schools were all situated in the western suburbs of Melbourne, a predominantly working class area. Usable responses were obtained from 757 participants in the school sample and 250 participants in the university sample. A modified version of the SOGS was used, with changes made for Australian idiom and the age of the population. The major change was that a 5-point Likert scale was applied to the problem gambling statements to maintain consistency in response requirements across the questionnaire. Moore and Ohtsuka (1997) found 3 per cent of the young people surveyed classified themselves as problem gamblers, lower than expected given previous research.

AUTHOR:	Moore and Ohtsuka (1997).
COUNTRY:	Australia.
METHODOLOGY:	Objective to examine potential predictors of gambling behaviour and problem gambling, 1,017 young people, age 14-25 years.
SCREEN/MODEL:	Predictive model based on Theory of Reasoned Action (TRA), with survey; sections to measure gambling intentions and behaviour. Authors modified SOGS.
STRENGTHS:	Attitudes to gambling study.
WEAKNESSES:	Not a screen but a model of 'predictive behaviour', and not able to predict for problem gambling.

A recent study of South Australian high school attending students (Delfabbro et al, 2003) sampled surveyed year 10, 11 and 12 students. Interestingly in this study, the authors stated that "most adolescents did not experience gambling related problems. Problem gambling was classified as a score of 4 or higher on the DSM-IV-J. Based on this classification, 3.5 per cent of participants could be categorised as problem gamblers."[13] This is at the low end of rates for youth problem gambling reported in North America, Canada and the UK which are said to range from 3.5 per cent up to 8 per cent.

AUTHOR:	Delfabbro, P and Thrupp, L., (2003).
COUNTRY:	South Australia, Australia.
METHODOLOGY:	Survey in 6 schools, sample of 505 year 10, 11 and 12 students, use of 5 point LIKERT scale to assess gambling habits, attitudes towards gambling, problem gambling measure and other factors.
SCREEN/MODEL:	DSM-IV-J Fisher 1999 version to assess problem gambling, 9 questions, yes/no response, 4+ indicate problem gambling.
STRENGTHS:	N/A.
WEAKNESSES:	Not an assessment of DSM-IV-J.

[13] Delfabbro, P., et al (2003), "The social determinants of youth gambling in South Australian adolescents", *Journal of Adolescents*, Vol. 26. p. 323.

4. Methodological Considerations

Debate continues as to the appropriate theoretical underpinnings of gambling screens, the various models (medical, behavioural, social/environmental) and understanding of problem gambling behaviours that the screens are said to be designed to assess, and the broader understanding of problem gamblers (individual pathology through to the 'continuum of problem gambling'). The medical, individual pathology/addiction model screens to test if the condition is either present or absent (dichotomous). Other theoretical understandings such as the problem gambling approach adopt a scaled or measure of 'at risk' approach to reflect the continuum of possibilities.

Studies into problem gambling using prevalence estimates rely principally on self-reporting techniques, which are frequently unsupported by other information which would improve the validity, reliability and accuracy of the estimates (i.e., known basic characteristics of respondents). The literature indicates that a variety of survey techniques are employed, many of which are not fully explained; conclusions and estimates of cut-off points are often highly subjective. "Goal post shifting' is observed particularly in relation to the degree of gambling participation which is claimed to represent problem gambling. Clear examples of response bias can be observed in many surveys yet this often is overlooked or not commented upon at all.

Svensen (undated) examined the question of how should prevalence be measured in order to explain why Australians' high per capita gambling expenditure does not appear to translate into high (or at least higher) apparent prevalence. **Essentially, he concluded that the answer to this question is the result of a failure to measure consistently and accurately**. One explanation for this is the replacement (or contesting) of the previous dominance of the medical model with its emphasis on pathological gambling, by other approaches including *inter alia*, the problem gambling model and harm minimisation. The difficulty of these approaches is that "estimates based on the problem gambling model are arbitrary as they depend upon the degree of problems judged necessary to meet cut-of criteria" (Svensen p. 4).

Broader methodological questions regarding the conduct of prevalence studies, and particularly in regard to young people include:

- non-response bias;
- small sample size (particularly to test and validate screens);
- propensity of gamblers to lie about their behaviour;
- confusion and lack of understanding about the questions which can exacerbate the problem of false positives and false negatives;
- time scale of measurement: life-time prevalence rates, past 6 months, past 12 months;
- is the study to be used to predict future behaviours (i.e., be clear about the purpose for which the prevalence rate will be used including for estimating economic and social costs, risk diagnosis, therapeutic/treatment);
- is the study to be used to document current behaviour and how is this expected to change as young people grow through the 'period of experimentation';

- measuring the scale of harm as young people may have less at risk in that are unlikely to lose their job, house or other assets; and
- participation and gambling preferences differ by gender.

4.1 Implementation Methodology: Surveys

Svensen (undated) notes that all surveys are subject to non-response biases and sampling errors and these create large problems for studies on problem gambling due to the low prevalence rate. As Shaughnessy et al (2000) notes there are three principal ways of obtaining survey data:

- mail surveys;
- personal interviews; and
- telephone interviews.

Each one of these methods has its advantages and disadvantages. Firstly, mail surveys are quick and easy to administer but there may be a response bias. Personal interviews are costly but allow the interviewer more control of the interview. A disadvantage is that the interviewer may influence the responses obtained. This may happen inadvertently. Lastly, telephone interviews, which are becoming increasingly popular, have the advantage of being much less costly than personal interviews and being simpler to oversee. Telephone interviewers have the disadvantages of missing a large group of respondents who do not have telephones that may influence results. Research has found that people take less time to form judgements on the telephone and have a larger difficulty remembering options.

Shaffer et al (1997) in their meta-analysis of problem gambling prevalence studies in the United States and Canada found a number of different factors influenced prevalence rates. Firstly, subject or population attributes accounted for more variance associated with prevalence estimates than any other single factor. In addition to individual respondent trait characteristics the research process also influenced estimates of disordered gambling prevalence. Process issues include: measurement instruments; geography or location; principal investigators and historical moment of study (although this only effects adults). Surprisingly, the quality of research methods exerts little influence on prevalence rates of problem gamblers.

An important issue for this review is the difficulty in surveying young people who are neither at school or attending university. There is some concern that adolescent surveys completed only in the school context will obviously exclude non-school attendees who may have significantly different characteristics than school students. Udry and Chantala (2003) explored the question of excluding school dropouts from surveys and what impact this had in biasing risk estimates. Respondents details were taken from school rosters and the surveys were completed a year or two years after with the student at their home, irrespective of their enrolment status. The behaviours collected by the survey they used for their analysis included: having sex, substance abuse, witnessing or experiencing violence, emotional distress, and exercise and diet. They found that responses from adolescents that had left high school before graduating were different. However, basing sample surveys on schools rather than on homes will not significantly

bias population estimates for adolescents due to omitting those who have left before graduating or have left due to graduation. Udry and Chantala (2003) state that the reason for this was that at the time of the study in the United States drop out rates were so low, at a national level, that the absence of adolescents who have not completed school did not bias estimates for the total population. However, the study does make the oversight of categorising adolescents planning to go back to school as enrolled; this raises some concerns on their findings.

4.2 Clarity, Ambiguity and Interpretation

We have cited the research work, particularly of Ladouceur (2000) on both understanding items and survey methodologies (telephone, face to face) that may lead to the problem of 'false positives' (see discussion in Sections 2.2 and 2.3 with adults and adolescents).

Ambiguity and lack of clarity of questions, definitions and instructions is also of concern.

Blaszczynski (1997) examined respondents interpretation and answers to the question "how much do you spend gambling" because the validity of questions in any screen or survey depend on the lack of ambiguity in interpretation. He recommended that more "attention be paid in prevalence and clinical studies to providing subjects with clear instructions" to the expenditure question under study, but to other items more generally. The point here is that both authors referred to above have demonstrated that lack of clear definitions or instructions can have an impact on reported prevalence rates. Survey techniques such as use of the telephone can lead to impulsive responses.

4.3 Schools and Consent Procedures

McPhee and Canham (2002) argue that active consent procedures, used to protect students, can cause problems for the validity of study results. The process of consent procedures may result in low parental response rates, low participation rates and a distinct subpopulation of youth that threaten the external validity of studies. Their review of the literature found that youth that do not receive parental permission are quite different compared to do those who do. Studies have found the following characteristics are more likely have been given for students not receiving parental permission: rated by peers and teachers as being less popular, less academically competent, more socially withdrawn, more aggressive, high in risk-taker, have lower self-esteem and tend to engage in substance use and other problem behaviours. For these reasons, McPhee and Canhan (2002) argue for a passive consent procedure.

Although, McPhee and Canham (2002) argue for a passive consent procedure, in practice, due to many existing school policies, they were required to undertake a survey under active consent procedures. They made a number of recommendations to increase participation rates by both students and individual schools if this regime is chosen.

Firstly, they suggest forming a multidisciplinary committee to guide the research project (their team included a former principal to fulfil a role as educational consultant). Second, ensure minimal disruption to the school, staff and students in the following

ways: ensure that the survey is as short as possible, researchers should work around the school timetable and make sure demands on teachers and staff are minimal. Third, they suggest educating school administrators and staff about the research and the research procedure. McPhee and Canham (2002) gave presentations to school staff which made teachers more comfortable with the research. These face–to-face sessions provided the added benefit that staff were able to be made more aware of youth gambling problems and issues. Finally, they maximised student participation in the survey by increasing parental consent. They did this by using several communication methods such as school newsletters, parent council meeting and student council meetings and local newspapers, among others, to inform and educate the school community. They also developed a package for parents that included the consent form, a brief description of the study, and contact names and phone numbers for addressing concerns. Parents could also indicate that they wanted a copy of results. Parents who did not return a consent form by the specified date were sent a reminder notice and then sent an additional package if a response was still not sent. To encourage co-operation from the school the researchers even provided a youth gambling related activity to students who did not have parental consent to complete while others were responding to the survey. At the conclusion of the study, the researchers recommended providing thorough and clear results to the schools in different formats, including *inter alia*, summaries and presentations.

4.4 Self-Awareness Feedback

Intervention following the findings of juvenile prevalence studies is problematic for privacy and other reasons. Jacobs (2000) states that "all too familiar is the paradox of an individual obtaining high SOGS scores in company with a denial that a problem with gambling had ever existed" (p. 144). It should be considered as part of the methodology that feedback to those who record high scores is offered following the survey.

Another methodological approach could involve providing a scoring method for self-test surveys so that the individual could assess their level of risk at the conclusion of the survey. They could also be informed where to find further information. While protecting privacy and anonymity is important some form of "self-awareness feedback" (Jacob, 2000) should be built into juvenile prevalence studies.

4.5 Other Research Methods

It is clear from longitudinal studies that gambling preferences change with age, from informal to legalised activities and from games of skill and sports betting to games involving continuous play hosted in licensed venues. The gambling behaviours of 15 and 16 year olds are different to those of a 24 year old and the social context in which preferences change is important. This suggests a role for a longitudinal study alongside any national prevalence study.

There may also be a role for other qualitative methods, including *inter alia*, interviews, focus groups and case studies to understand the sociological factors that influence gambling behaviour. Peer pressure, familial patterns, the association between school performance, alcohol and drug use, attitudes to gambling, exposure to gambling and access issues can be explored in detail using such techniques. Certainly it is the case that

the role of gambling in youth culture is not well understood; gender issues are important and the role of ethnicity is also unclear. No single prevalence study is likely to satisfactorily address 'existing puzzles'.

4.6 Distinguishing Between Different Age Groups

ToR:3 considered the need to distinguish between different age groups including 15-18 year olds and 19-24 year olds. In the discussion of various screens in Section 2 we have drawn attention to screens that have been developed for adolescents and in Section 3 provided commentary on selected studies with a focus on youth gambling.

In this brief review it is not possible to cover the ever expanding number of articles and studies into adolescent gambling. Suffice to say, primary school students, secondary and college students from 15 to 24 have been the subject of many studies — in school based surveys, telephone sample surveys, by grade level, through general health and substance use surveys. A variety of methodologies were used; sample and whole population studies; random and non-random selection; longitudinal and point estimates; using adolescent and general screens. The objectives of the many studies are equally varied including, *inter alia*, to report on prevalence rates, to discover risk factors, to assist with education and interventions, and to identify types of gambling causing the most significant difficulties.

One of the most interesting findings is the general conclusion that age has not been found to be a predictor of problem gambling among adolescents (Poulin 2002, Winter et al, 2000, Wiebe 1999). A parent who has/had a gambling problem is more likely to be a predictor of problem adolescent gamblers. Prevalence rates for males are higher than for females (rate varies between 3 and 8 times). The age at which a respondent is involved in a prevalence study appears to influence their response to 'first gambling activities'.

A significant number of studies report higher rates of gambling for adolescents than for adults. An example of this is the study of Gambling Prevalence Among Adolescents in Florida comparing adolescents aged 13-17 years with all adults:

- at risk gamblers (youth 8.2 per cent vs. adult 4.0 per cent);
- problem gamblers (2.7 per cent vs. 0.5 per cent); and
- probable pathological gamblers (1.1 per cent vs. 0.3 per cent).

While many authors/researchers comment on similar findings no satisfactory explanations are provided as to why the rates decline. Table 4.1 and Appendix B provide a summary of youth prevalence studies and adult prevalence studies in Canada. The studies are not comparable because of different definitions, use of different screening instruments, survey methodologies and age ranges of youth. Very few of the studies we have cited report on the accuracy, validity or reliability of their results, a comment supported by Poulin (2000) when she states

> "In the absence of such information it is difficult to know if observed differences in estimates are a reflection of real differences in the rates of at-risk and problem gambling in the underlying populations, or of different methods, or of various threats to validity and reliability", (p. 74).

In terms of this review, we can say that there are numerous studies covering the age range 12 to 17/18 years and class levels 8-12 and primary school level. Young people 18-24 years are almost always included in adult prevalence studies. Canadian Province or USA state commissioned studies on youth prevalence most often are restricted to adolescents aged 12 to 17 years (e.g., Shapira 2002).

Table 4.1
Canadian Adolescent Prevalence Studies

	Definitions[1]	Year	Screen	At Risk	Problem Gambling	Combined Rate
Atlantic Provinces[2]	B	1998	SOGS-RA	8.2	6.4	
Atlantic Provinces	N	1998	SOGS-RA	3.8	2.2	
Manitoba[3]	N	1999	SOGS-RA	8.0	3.2	
Quebec[4]	-	1996	SOGS	4.8	2.6	
Ontario[5]	B	1994	SOGS-RA	-	8.1	
Alberta[6]	-	1996	SOGS-RA	15.0	8.0	
Alberta[7]	N	1995	SOGS-RA	25.0	21.0	
Alberta[8]	-	2002	SOGS-RA	Combined problem and hazardous gamblers		9.5
Ontario[9]	-	2001	SOGS-RA	Combined problem and hazardous gamblers		13.3
Ontario[10]		1999	SOGS-RA	Combined problem and hazardous gamblers		8.3
Nova Scotia[11]		2002	SOGS-RA	Combined at risk and problem gamblers		5.1
Nova Scotia[12]		1998	SOGS-RA	Combined at risk and problem gamblers		6.8

Notes:
1 Definition refers to broad or narrow definition adopted from Winters (1993). Discussion in Section 4.6.
2 N = 13,549 students in grades 7, 9, 10 and 12, school-based.
3 N = 1,000 aged 12-17 years, telephone survey.
4 N = 3,426 aged 12-17 years, school based.
5 N = 965 aged 14-19 years, three high schools.
6 N = 972 aged 12-17 years, telephone survey.
7 N = 961 Aboriginal adolescents.
8 N = 3,394.
9 N = 4,211.
10 N = 4,894.
11 N = 4,274.
12 N = 3,755.

Source: Derived from Poulin (2000), compiled by SACES.

5. Future Options

In this Section the researchers address ToR:4, specifically to consider the issues that a consideration of youth gambling prevalence studies would need to address and other approaches to improve understanding of youth gambling behaviours and patterns.

This discussion paper on a review of literature of youth prevalence studies and measurement of prevalence of youth problem gambling was prepared for the Department of Family and Community Services (FaCS) as one input into their research and consideration of youth and gambling issues. The paper is not intended to be an exhaustive analysis of the numerous studies undertaken on youth and gambling. This would not be possible given the time frame, but more importantly, the plethora of studies into youth and gambling. The researchers principal focus has been concerned with the different methodological approaches used to study youth gambling patterns, the use of different gambling screens including those adapted specifically for young people and the results of such studies.

A number of concluding statements can be made based on the research undertaken:

- there is general agreement that there is no 'gold standard' or any single screening instrument that is better than another;
- the Productivity Commission concluded that "it is difficult to measure problem gambling among populations, and no existing single test instrument is perfect. The Commission used SOGS, self assessment methods and other methods to assess harm and prevalence rates, arguing that " a three way approach is better than relying on a single measure." (6.1);
- our finding is that youth prevalence rates range from 3.0 per cent of the youth population (15-18) up to 8.0 per cent and that prevalence rates are partially a product of the screening tools used;
- based on the review of available screens, if a major national prevalence study were to be undertaken then consideration should be given to the use of DSM-IV-MR-J for adolescents as it has a low reading age that should facilitate accurate responses. It would also be advisable to include a second screening instrument in a self-assessment, paper and pencil exercise and we advise that the SOGS-RA should be included. We advise using two screens with several groups. While there is no gold standard the choice of SOGS-RA and DSM-IV-MR-J are likely to facilitate better international comparisons;
- we have not been able to find any screen in which the authors express confidence about its validity, reliability, sensitivity and discriminative power in regard to young women;
- most prevalence studies are point in time estimates and tend to conjecture about the notion of 'at risk'. Environmental, social, cultural and familial circumstances contribute to the propensity to gamble and thus information about these circumstances may be required to more comprehensively establish the 'notion of at risk in the future';

- a longitudinal study where gambling issues are integrated into broader health issues may in fact, be the preferred approach. It is clear that gambling preferences (and opportunities) change with age while high youth prevalence rates do not appear to translate into equally high rates for adults. Documenting changes in preferences would be part of any longitudinal study. Other issues would include: does gambling frequency peak and then decline; need to separate wagering from gambling, ability to test hypotheses in longitudinal study. Time interval is important for measuring rate or prevalence.

A longitudinal study in which two gambling screens are incorporated would be an appropriate national initiative. While individual States have their own research capacity no State has the capacity or funding to undertake a major, longitudinal study. A component on youth gambling behaviours could be incorporated into other areas, including, *inter alia*;

- youth leisure and well being (where well-being examined issues of isolation, depression, suicide, etc.);
- youth health and leisure; and
- youth leisure including alcohol and drug use survey.

The youth cohort would comprise Year 8-12 students so that the Year 8 group is re-surveyed at Year 10 and Year 12.

For participants in any longitudinal study it will be important that self-awareness feedback is provided. Feedback to raise self-awareness, to improve coping skills and to develop self monitoring skills are an aid in preventing the onset of problem gambling.

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Appendix A

Endorsement and Discrimination

Measures of the performance, specifically the validity of the screen, its relationship to some theoretical model and the reliability of the screen are usually discussed under the following headings[14]:

Endorsement: refers to the count or frequency of respondents who respond to each question or category in each question.

Discrimination: refers to whether or not an item discriminates between those who score high and those who score low (i.e., you may hypothesise that a question would discriminate on the basis of gender or age).

Construct Validity: that an item in a screen measures what theoretically and conceptually it is supposed to measure. For example, what a psychologists measures by interview should also be closely measured by the screen (a question or a set of question). A further measure is by the use of correlates to measure how well the screen predicts (e.g., excessive gambling associated with smoking).

Content Validity: what does the screen purport to measure and its relationship with the relevant theoretical model. Is the screen measuring pathological gambling (DMV-IV), harm to others or harm to self, etc.. Screens vary based on theoretical model and cluster of items.

Measures of reliability relate to the stability and internal consistency of the screen:

Stability: is demonstrated if the results of a measurement are identical or similar each time it is conducted (Streiner and Norman: 1991). Measure of agreement of a test and retest.

Internal Consistency: is a measure of the internal correlation of items which demonstrates the extent to which items in a scale measure different aspects of the same attribute. For example, taking each item in a screen and correlating it to the overall scare; if the item correlation to the total score is high this indicates a high degree of internal consistency.

Classification Validity: the usual statistical technique to determine classification of gambling status is to examine the distribution of scores and assign boundaries based on cut-off scores. The distribution of scores will show some evidence of multiple peaks; however, there are clear situations where no evidence for classification can be drawn from the distribution and sensitivity analysis may be used to construct the best judgement.

[14] Based on discussion by Poulin (2002), Rossen (2001), Ladouceur (2000), Oxford et al (2003) and McMillen (2003). The SA Centre for Economic Studies acknowledges that the authors listed here have conducted the most intensive examinations into the construction, validity and reliability of gambling screens.

Appendix B

Summary of Canadian Problem Gambling Prevalence Surveys

Province	Year Released	Combined Prevalence Rate*	Sample Size	Instrument	Author
Adult					
British Columbia	1994	3.9%	1200	SOGS	Gemini Research
British Columbia	1996	4.2%	810	SOGS	Angus Reid Group
Alberta	1994	5.4%	1804	SOGS	Wynne Resources
Alberta	1998	4.8%	1821	SOGS	Wynne Resources
Saskatchewan	1994	2.7%	1000	SOGS	Volberg
Manitoba	1993	4.2%	1212	SOGS	Criterion Research
Manitoba	1995	4.3%	1207	SOGS	Criterion Research
Ontario	1993	8.6%**	1200	SOGS	Insight Canada Research
Quebec	1991	3.8%**	1002	SOGS	Ladouceur
New Brunswick	1992	4.5%	800	SOGS	Baseline Marketing Research
New Brunswick	1996	4.1%	800	SOGS	Baseline Marketing Research
Nova Scotia	1993	4.7%	810	SOGS	Omnifacts Research
Nova Scotia	1996	5.5%	801	SOGS	Baseline Marketing Research
PEI	1999	3.1%	809	SOGS	Dorion & Nicki
Adolescent					
Alberta	1996	23%	972	SOGS	Wynne Resources
Manitoba	1999	11%	1000	SOGS-RA	Wiebe
Nova Scotia	1993	11.7%	300	SOGS	Omnifacts Research
Older Adult					
Manitoba	2000	2.8%	1000	SOGS	Wiebe
Aboriginal					
Alberta (adult)	2000	25%	500	SOGS	Auger & Hewitt
Alberta (adolescent)	1995	49%	961	SOGS-RA	Hewitt & Auger

Notes: * Combined prevalence rates include the number of respondents who score as either problem or probable pathological gamblers according to the SOGS.

** Only lifetime rates (percentages) are reported for the Quebec and Ontario studies; whereas, for all other studies, current rates (percentages) are shown. "Lifetime" questions ask whether the respondent has ever experienced a problem; whereas, "current" questions ask this only for the past 12 months.

Source: "Measuring Gambling and Problem Gambling in Alberta", Final Report, February 2002.