report

Gambling Related Harm:

A review of the scope for population health intervention

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Contents

Background to Review: Gambling in Scotland 3
Methodology and Research Questions 4
Quality of evidence and limitations of this review 5
Findings: 6
Motivations for problem gambling 6
Identifying problem gambling 8
Associations of gambling with other health conditions and lifestyle behaviours 16
Alcohol use 16
Tobacco use 17
Substance abuse 18
Mental health 18
Aggression 19
Adolescent gambling 19
Prevalence and gambling behaviours 19
Online gambling 20
Health risks associated with online gambling (not age specific) 20
Contextual Factors 21
Familial exposures 21
Working in the Gambling Industry 21
Prison health 21
Exposure to gambling marketing 23
Social marketing and gambling 25
Discussion 25
What is effective in addressing problem gambling behaviour? 25
Primary prevention interventions 27
Improve assessment and surveillance 27
Improving understanding of barriers to seeking help 27
Informing intervention design through improving understanding of differences in health seeking behaviours 28
Public Education 29
Investigate the potential of applying learning from other areas 32
Secondary Prevention interventions 32
Support skills development initiatives 32
Self Exclusion 34
Tertiary Prevention 34
Internet based approaches to address problem gambling 34

Inequalities and Gambling 35
Areas where additional research may be helpful 36
Role of regulation as part of an overarching risk and prevention strategy 36
Needs Assessment 37
Concluding remarks 37
Appendix 1: Search Strategy 38
Appendix 2: Abbreviations utilised in report 45
Appendix 3: Overview of literature 46
References 75

Background to Review: Gambling in Scotland

In recent years, the focus on gambling behaviour and gambling related harm has intensified as an area of public health interest. As gambling has become more widely accessible, the issue of gambling behaviour has become an increasingly important area to consider for population level interventions. It is not a homogenous set of activities, but rather a generic term covering a broad range of behaviours and activities. Arguably, many gambling activities have become increasingly normalised, with deregulation leading to the opening up of new opportunities to gamble, multimedia platforms opening up opportunities for interactive gambling, alongside the development of the national lotteries, television advertising, and many online services and programmes opening up knowledge of gambling opportunities to new markets for the provision of gambling services. Unsurprisingly, increased accessibility of legalised gambling opportunities has been accompanied by increased interest in gambling related harms, individual, familial and societal costs. In addition, potential problems are emerging associated with the compulsive behaviours associated with online and computer gaming, which are increasingly conflated with real time gambling. Despite the broad range of new, emerging, and existing challenges, arguably, however, gambling issues lack the salience of ongoing high-profile topics such as the economy, health care, education and the environment, and as such achieve lesser public recognition. (Smith, Schopflocher et al. 2011)

In January 2007, the British Medical Association published a report recommending that those experiencing gambling problems should receive treatment via the National Health Service (NHS). However, there is some evidence that treatment provision remains at best patchy, with presentation with other co-morbid disorders being a key factor in access to treatment through the NHS. (Rigbye and Griffiths 2011)

This report focuses on the scope for population level intervention to address the challenges associated with problem gambling behaviours and gambling related harms. Definitions of problem gambling vary across the literature, with a range of terms used to describe problematic gambling, including: compulsive, pathological, disordered, level 2 and level 3, neurotic, at-risk, problem, excessive, addicted, with attempts focusing on differentiating between behaviour which is controlled, recreational, and social, and behaviour which results in significant detrimental consequences to the person gambling and to others. Such definitions tend to suggest that gambling is a problem that one has, or does not have, suggesting that those who exhibit problem gambling symptoms are in some way different from the general population, with minimal attention focused on the consequences of the behaviours. Other definitions focus on the problems associated with gambling behaviour, although one of the challenges of this approach can be that it may focus attention on the consequences of the gambling behaviours, with limited attention given to any predisposing factors. In recent years, there have been new attempts to broaden this conceptualisation, bringing in consideration of societal, community, and familial consequences, as well as personal harms. In effect, the concept of problem gambling is used to denote both a description of behaviour, and an end state on a continuum of gambling related harm from non-problematic gambling, through at risk gambling to problem gambling.

Against this context, with no single definitive definition available, this report has chosen to utilise the definition of problem gambling utilised in the 2013 Scottish Health Survey, i.e. ‘gambling to a degree which compromises, disrupts or damages family, personal or recreational pursuits’, recognising that problem gambling is not a single disorder, but encompasses a range of behaviours and an evolving understanding of the nature of the

problem eg DSM IV characterises 'pathological gambling' as an impulse control disorder, whilst DSM V introduces the term 'disordered gambling', which it characterises as a behavioural addiction.

In Scotland, according to the 2013 Scottish Health Survey[1], almost three-quarters of the population placed a bet in the past year. In 2012, 74% of men and 67% of women gambled and 0.7% of adults - some 31,000 - were identified as problem gamblers, with a further 3% of adults at low risk of harm from their gambling behaviour and 1% at moderate risk. Buying tickets for the National Lottery draw was the most popular form of gambling activity among all adults (58%). This was followed by purchasing scratchcards (18%), other lotteries (15%) and betting on horse races (not online) (10%). Forty-five percent of adults participated in gambling that excluded National Lottery only play and one in twelve (8%) participated in online gambling (excluding the National Lottery). The survey also found that gambling was gendered, with women less likely to gamble than men, and typically taking part in a smaller range of activities. Only four activities (National Lottery, scratchcards, other lotteries and bingo) were undertaken by more than 10% of women whereas among men, seven different gambling activities had participation rates of more than 10%. Despite age restrictions prohibiting children and adolescents from engaging in gambling behaviours, there is an increasing evidence base showing the growing prevalence of under-age gambling. This is, at present, largely unmeasured, but the current and future consequences of involvement in gambling behaviours within this age group also need to be considered.

Such statistics make uncomfortable reading, and it is likely that many people will be unaware of the growing prevalence of gambling behaviours. It is against this context that ScotPHN commissioned this literature review.

Methodology and Research Questions

A literature search was conducted during January 2014 by ScotPHN to identify evidence on problem gambling and gambling related harms. The searches sought to identify peer reviewed articles, including guidelines, health technology assessments (HTAs), systematic reviews and primary level evidence. Database searches were limited to English language and publications from 2000 to January 2014. The review included both national and international literature. The research questions which guided the search strategy were:

- What is problem gambling behaviour?
- What might be the appropriate public health actions, and at what level of the system?

The key words utilised for the search are summarised in table one. A full copy of the search strategy can be accessed at Appendix 1. A list of the abbreviations utilised in the report is appended at Appendix 2.

Table 1: Search terms

Search areas	search terms
Meta terms	Gambling/gambler Problem gambling/gambler Disordered gambling Pathological gambling/gambler Recreational gambling Gambling addiction Public health

[1] http://www.scotland.gov.uk/Resource/0043/00434590.pdf

Table 1: Search terms	
Search areas	search terms
Risk factors/co-morbidities	Co-occuring disorders/behaviours, eg smoking, depression, anxiety, substance use disorders and nicotine dependence Gambling related harms Environmental risks
Populations of interest	Young people Adolescent Families communities
Initiatives	Regulation/deregulation Harm minimisation Health promotion Safety controls, eg. For technology based gambling Behavioural interventions Environmental interventions
Gambling typology	Online gambling Traditional gambling Habit* gambling Internet gaming Remote gambling betting
Intervention levels	System Individual Community
Limits	English only Abstract available 10 years
Exclusions	Psychotherapeutic interventions Pharmacological and psychopharmacological approaches Literature related specifically to gaming strategy, eg for pelota Literature related specifically to populations not represented within the Scottish population, eg indigenous Australians Literature related specifically to gaming classification strategies Reviews looking at addictive behaviour, where gambling was a minor thread in the article, with limited/no specific discussion Articles without a gambling element – i.e. consideration of whether a lottery (prize draw) acts as an incentive for participation in a survey

Quality of evidence and limitations of this review

One of the key challenges observed in this review of the literature was that despite the proliferation of papers (over 2000 studies were initially identified, and the abstracts reviewed to inform this paper), there is a paucity of comparable, generalizable data. Many of the studies and papers identified were small scale studies, with limited information to determine whether the study methodology was robust, or the findings generalizable. Whilst a number of systematic reviews were found (Wenzel and Dahl 2009), they in turn identified few papers suitable for inclusion in their review, and generally concurred that the data available for analysis was limited, with a high frequency of methodological shortcomings in the studies included within their analysis.

This review does not reflect on the quality of the studies which have been performed. Rather it reviews the findings of the studies, to identify common themes and issues which could

potentially be considered in the development of interventions and strategies to respond to problem gambling in Scotland.

Findings:

Motivations for problem gambling

Across the literature a broad range of motivations have been identified for gambling (see table 3). There is general agreement that understanding the motivations driving behaviours is helpful in determining effective interventions.

Table 3: Reasons for Gambling: Broad themes		
Thematic Area	Reasons cited in literature	Comment
Social reasons	To meet (new) people Peer pressure Conformity Social recognition 'skills recognition'	There is some indication that the earlier one starts gambling the more likely one is to become a problem gambler. There is also some indication that the 'introducer' to the initial gambling experience is an important factor in the extent to which the gambling behaviour takes hold.(Reith and Dobbie 2011) A number of studies have also shown that family members attitudes and behaviours, parenting characteristics and the familial environment can also effect adolescent propensity to gamble. (Oei and Raylu 2004; McComb and Sabiston 2010). A US study found that social reasons tended to be the motivating factor for online bingo and card room games. (Lam 2007). A UK based study of female internet problem gamblers found that most of the women spent considerable periods at home and Internet gambling was something to do that was fun and where they could chat to others. (Corney and Davis 2010). For electronic gaming machines, one study found that whilst the machines promoted social facilitation, an audience may be a protective factor limiting player losses(Rockloff and Greer 2011).
Financial reasons	Easy money Reward Incentivisation Recoup losses	A US study utilising data from the National Gambling Impact Study found that regular on-line gamblers were motivated to gamble to win and to fulfil their sense of excitement/challenge for some gambling products like lottery, racetrack betting, and casinos. (Lam 2007) An American study reported that male youth engaging in informal gambling are more at risk for gambling problems than are those engaging in formal gambling.(DiCicco-Bloom and Romer 2012)
Excitement and amusement	Thrill seeking behaviour Competition Treat/special occasion	A small scale study found that risk taking behaviour in young males was highest at age 14. (Burnett, Bault et al. 2010) A combination of poor coping skills, and a poor understanding of random chance

		were found to be particularly important in adolescent gambling. (Monaghan and Derevensky 2008; Turner, Macdonald et al. 2008)
Escape/avoidance/coping	Escape from life, boredom, responsibility. Tension release	Escape was achieved through 'mood modification', involving fantasies, dissociation and/or changes in arousal. (Wood and Griffiths 2007)
Challenge/learning/knowledge	Skills development	Whilst this is recognised as a reason for gambling, no studies were found which specifically cited this as a motivation.
Other	Control Feeling lucky Drinking Adverts Access/opportunities Support a good cause…	A possible relationship exists between heightened accessibility to gambling and the development and maintenance of gambling problems amongst employees at gambling venues.(Hing and Breen 2008) An Australian study found that problem gamblers preferred venues which were open long hours and located close to home, work or regular routes, i.e., geo-temporal accessibility. Social and personal accessibility related to venues as safe, social, easy entertainment experiences, and as an accessible retreat from life issues.(Thomas, Bates et al. 2011)

Identifying problem gambling

The literature demonstrated that there are a number of gambling instruments currently in use to identify gambling behaviours in general and adolescent populations (see table 4). Whilst a number of studies compare and contrast individual instruments, this review did not find any study which provided a systematic review of the utility of the existing instruments for either the general population or specific sub-populations, eg adolescents. While the instruments are used with varying populations in divergent settings, this review was unable to find any data demonstrating their comparative psychometric properties for their use in these populations and settings.

Overall, the South Oaks Gambling Screen (SOGS) and its derivatives appear to be the most widely used measures in most contexts and parts of the world although the DSM-IV (Diagnostic and Statistical Manual of Psychiatric Disorders -- IV) measures and the CPGI (Canadian Problem Gambling Index) are increasingly being used. It is also worth noting that DSM-V is now being rolled out. [2]

[2] For an analysis of the differences between DSM IV and DSM V see http://www.ncrg.org/sites/default/files/uploads/docs/white_papers/ncrg_wpdsm5_may2013.pdf

Table 4: Screening Instruments Utilised in literature to identify problem gambling			
Screening Instruments	**Diagnostic Criteria**	**Comments**	**Studies Reporting Usage**
DSM IV diagnostic criteria for problem gambling[3]	A. Persistent and recurrent maladaptive gambling behaviour as indicated by five (or more) of the following: • is preoccupied with gambling (eg, preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble) • needs to gamble with increasing amounts of money in order to achieve the desired excitement • has repeated unsuccessful efforts to control, cut back, or stop gambling • is restless or irritable when attempting to cut down or stop gambling • gambles as a way of escaping from problems or of relieving a dysphoric mood (eg, feelings of helplessness, guilt, anxiety, depression) • after losing money gambling, often returns another day to get even ("chasing" one's losses) • lies to family members, therapist, or others to conceal the extent of involvement with gambling • has committed illegal acts such as forgery, fraud, theft, or embezzlement to finance gambling • has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling	offers a clinical description with little empirical support outside of a treatment environment, hence may contribute to under estimation of prevalence. Recognises only the presence or absence of a clinical disorder, although evidence suggests that gambling problems exist on a continuum and that subclinical instances of Problem Gambling are more prevalent. Subclinical pathological gamblers have been defined as having difficulties as a result of their gambling but do not fulfil the five criteria for a diagnosis Includes problem gambling within impulse control disorder categorisation, but pathological gamblers, while in action, often find their gambling enjoyable and only after the gambling is terminated or losses are incurred do pathological gamblers begin to feel distress. This contrasts with sense of relief reported by actions undertaken from other categories of impulse control disorders, eg pyromania. A study comparing the effectiveness of the criteria against a clinical interview found that a greater percentage of people (23.5% more) were found to have a severe gambling problem with the criteria than with the interview. (Murray, Ladouceur et al. 2005) Some indications that the revised version of the questionnaire for use with youths may have been used inappropriately in the past, with criterion causing confusion. A study comparing the DSM IV with the PGSI found the DSM-IV-based scale showed only satisfactory internal reliability, evidence suggesting bi-dimensionality, and poor	(Orford, Sproston et al. 2003; Orford, Wardle et al. 2010; Lahti, Halme et al. 2013)

[3] http://www.problemgambling.az.gov/signs4.htm

	• relies on others to provide money to relieve a desperate financial situation caused by gambling B. The gambling behaviour is not better accounted for by a Manic Episode.	performance of at least two items: those relating to gambling-related crime and 'chasing losses'.(Orford, Wardle et al. 2010)	
Centre for Addiction and Mental Health Inventory of Gambling Situations (CAMH-IGS)	The CAMH-IGS is based on a cognitive-behavioural approach to addiction that sees excessive gambling as a pattern of behaviour which is learned, and which can be changed. The CAMH-IGS is designed to determine the patterns of behaviour, thoughts or feelings which may trigger problematic gambling, with the goal of developing tailored treatment and relapse-prevention approaches for clients.		(Turner, Littman-Sharp et al. 2013)
DSM V	Proposed changes for PG in DSM - V (www.dsm5.org) 1) Changes the name from Pathological Gambling to Disordered Gambling 2) Reclassifies the disorder from Impulse - Control Disorders Not Elsewhere Classified to Substance-Related Disorders which will be renamed Addiction and Related Disorders; 3) Eliminates the criterion, "has committed illegal acts such as forgery, fraud, theft, or embezzlement to finance gambling" 4) Lowers threshold for diagnosis from five to four criteria 5) Introduces specified time period; symptoms must be present during a 12 month time period	A study which looked at the proposed new criteria for DSM V found that the inclusion of the illegal acts criterion in the proposed DSM-V pathological gambling diagnosis does not appear necessary for diagnosis of pathological gambling and, if it is eliminated, reducing the cut-point to four results in more consistent diagnoses relative to the current classification system.(Petry 2010; Petry, Blanco et al. 2013) This decision reflects a solid evidence base showing that illegal activities tend to be committed by severe pathological gamblers, i.e. generally long after people have reached the threshold for identification as a problem gambler. (Bowden-Jones 2013)	**(Petry 2010; Petry, Blanco et al. 2013) Bowden-Jones 2013)**
DIGS	DIGS directly measures symptoms of pathological gambling 19 questions, with three potential answers. See http://www.fvfiles.com/541763.pdf	Found to be useful with College students.	**(Fortune and Goodie 2010)**
Gamblers anonymous 20 questions	It is expected that compulsive gamblers will answer yes to at least seven of the questions. 1. Did you ever lose time from work or school due to gambling?	The results from their instrument have correlated strongly with other tests that screen for compulsive gambling (eg the Total Sensation Seeking Scale, Boredom Susceptibility,	(Bulcke)

	2. Has gambling ever made your home life unhappy? 3. Did gambling affect your reputation? 4. Have you ever felt remorse after gambling? 5. Did you ever gamble to get money with which to pay debts or otherwise solve financial difficulties? 6. Did gambling cause a decrease in your ambition or efficiency? 7. After losing did you feel you must return as soon as possible and win back your losses? 8. After a win did you have a strong urge to return and win more? 9. Did you often gamble until your last dollar was gone? 10. Did you ever borrow to finance your gambling? 11. Have you ever sold anything to finance gambling? 12. Were you reluctant to use "gambling money" for normal expenditures? 13. Did gambling make you careless of the welfare of yourself or your family? 14. Did you ever gamble longer than you had planned? 15. Have you ever gambled to escape worry or trouble? 16. Have you ever committed, or considered committing, an illegal act to finance gambling? 17. Did gambling cause you to have difficulty in sleeping? 18. Do arguments, disappointments or frustrations create within you an urge to gamble? 19. Did you ever have an urge to celebrate any good fortune by a few hours of gambling? 20. Have you ever considered self-destruction or suicide as a result of your gambling?	Experience Seeking, South Oaks Gambling Screen, and Disinhibition subscales) The questions are designed to be answered by the gambler, so an element of self-reporting bias cannot be ruled out. Does not provide any insight into co-occurring disorders/challenges which may affect the propensity to gamble	
South Oaks Gambling screen	The South Oaks Gambling Screen is a 20-item questionnaire based on DSM-III criteria for pathological gambling. It may be self-administered or administered	Has been criticised for excessive number of false positives – widely used in literature and has been translated for use in many countries.	(Bulcke ; Clarke and Clarkson 2009; Barrault and

	by nonprofessional or professional interviewers. It identifies prevalence and exposure to different types of gambling; investment in a single day; parental engagement in gambling; return to recoup losses; guilt; criticisms from others; borrowing behaviour, etc.		Varescon 2013; Lahti, Halme et al. 2013)
Gambling motivation scale			(Clarke and Clarkson 2009)
Canadian Adolsecent gambling inventory	http://www.ccsa.ca/2010%20CCSA%20Documents/CAGI_Survey_Instrument_e.pdf 44 questions – targeted at adolescents. The questions in the CAGI survey are designed to not only measure whether an adolescent has a gambling problem, but to also look at psychological and social harm, financial consequences and loss of control related to gambling behaviour.	Specifically developed for teenagers	
Canadian Problem Gambling Severity Index	The Problem Gambling Severity Index (PGSI) was designed to assess gambling problems in community samples. It has 12 items, nine of which are scored to determine problem gambling level.	including indicators of social context and degrees of problem severity, A UK study which investigated the psychometric properties of the PGSI using 2007 gambling survey data found that this had high internal reliability, uni-dimensionality, and good item-response characteristics. Several PGSI items showed extreme male to female endorsement ratios and a possible conclusion is that the PGSI is under-estimating the prevalence of problem gambling among women.(Orford, Wardle et al. 2010)	(Emond and Marmurek 2010; Boldero and Bell 2012; Clarke, Pulford et al. 2012)
NODS-CLiP	National Opinion Research Center DSM-IV Screen for Gambling Problems (NODS) has 17 lifetime and 17 current (past 12 month) items. Following the development of the NODS, Toce-Gerstein, Gerstein and Volberg (2009) used data from eight population surveys that included the screen to identify a subset of questions to which 99% of the NODS-classified pathological gamblers and 94% of the NODS-classified problem gamblers answered at least one in the affirmative. This new screen was dubbed the NODS-	Developed in response to perceived lack of clinician engagement in screening for problem gambling. Research determined that opportunistic screening would be appropriate in patients presenting with: • alcohol or other substance abuse disorders • post-traumatic stress disorder • disorders with a stress-related component (eg, headaches, gastric pain, nausea, tachycardia, angina) • bipolar disorder or depression • impulse control disorder	(Toce-Gerstein, Gerstein et al. 2009; Volberg, Munck et al. 2011)

	CLiP to remind users of the three criteria assessed using this screen (Loss of Control, Lying and Preoccupation) See - http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3670681/#!po=44.7368 for questions and protocol	•physically limiting disorders such as arthritis or obesity, or a physical disability (including hearing problems, vision problems and mobility problems).	
Lie-BET	The Lie/Bet Questionnaire is a two question screening tool for pathological gambling. The two questions were selected from the DSM-IV criteria for pathological gambling because they were identified as the best predictors of pathological gambling. The Lie/Bet Questionnaire is useful in determining if a longer screening tool or further assessment is appropriate. Lie/Bet Questionnaire: 1. Have you ever had to lie to people important to you about how much you gambled? 2. Have you ever felt the need to bet more and more money?	Lie/Bet screen may be useful to assess at-risk gambling for both genders in comprehensive youth surveys	(Rossow and Molde 2006)
Inventory of Gambling Situations	A 63 item self-reporting questionnaire, used by therapists to define treatment programmes for problem gambling.	Based on perception that problem gambling is a behavioural and cognitive problem.	(Smith, Stewart et al. 2011)
Gambling motives questionnaire	A 15 item measure of gambling motivations, which looks at enhancement, coping and social motivation.		(Zack, Stewart et al. 2005; Stewart and Zack 2008)
Temptation for gambling questionnaire	a new measure of temptation to gamble in 21 high-risk situations, consistent with social learning theory		(Holub, Hodgins et al. 2005)
EIGHT screen	A brief intervention screen developed in New Zealand for use with family practitioners – yes/no replies to 8 questions. With score of four or more seen as indicative of potential problem 1. Sometimes I've felt depressed or anxious after	Found to be valid in NZ. A study comparing use of SOGS and EIGHT in a prison setting in New Zealand found that the EIGHT screen was suitable for use in prison settings and it has now been	(Penfold, Hatcher et al. 2006; Sullivan 2007; Sullivan, Brown et al. 2008)

	a session of gambling 2. Sometimes I've felt guilty about the way I gamble 3. When I think about it gambling has sometimes caused me problems 4. Sometimes I have found it better not to tell others, especially my family, about the amount of time or money I spend gambling. 5. I often find that when I stop gambling I have run out of money 6. Often I get the urge to return to gambling to win back money from losses from a past session 7. Yes I have received criticism about my gambling in the pas 8. Yes I have tried to win money to pay debts	adopted as standard by the Department of Corrections. (Sullivan, Brown et al. 2008)	
Gambling Expectancy questionnaire	GEQ consists of three positive expectancy scales (enjoyment/arousal, self-enhancement, money) and two negative expectancy scales (over involvement, emotional impact).	Tested with adolescents in Canada. A total of 34 focus groups (198 students, ages 12–18) were conducted in Ontario and Quebec to validate the themes represented by the gambling expectancy items before the final testing of the scale. Groups consisted of between four and nine students at the same grade level.	(Gillespie, Derevensky et al. 2007; Gillespie, Derevensky et al. 2007)
Victorian Gambling Screen	• Timeframe for screen is 12 months • Originally a 21 item, three subscale measure (Harm to Self, Enjoyment of Gambling Scale, and Harm to Partner Scale); however only the 15 item Harm to Self-subscale related to problem gambling • Based conceptually on a social - oriented model surrounding the concept of harm • Having two cut-off points allows the VGS to be used both as a diagnostic tool based on the DSM criteria, as well as a broader continuum scoring tool utilizing the problem-centered harm model Interview can be done over the phone or in person	Findings from McMillen et al suggest this is less effect in adolescents than the CPGI.	(McMillen and Wenzel 2006)
Attitudes towards Gambling scale	14-item scale of general attitudes towards gambling	Based on the responses of a representative sample of 8880 people of 16 years of age or more, evidence is presented of good internal reliability and statistically significant associations with a range of socio-demographic, own and	(Orford, Griffiths et al. 2009)

		family gambling and lifestyle variables.	
Sydney Laval University Gambling Screen	Aims to identify prevalence rates and estimates for treatment services required	The South Oaks Gambling Screen (SOGS) and Sydney Laval Universities Gambling Screen (SLUGS) were administered to a sample of 2069 college and university students in Scotland. Results showed that 4% of respondents met criteria for probable padiological gambling. SOGS scores correlated significantly with rated level of problems but less than half (44%) of those meeting SOGS criteria indicated a need for treatment. Responses on the SLUGS indicated that impaired control and spending more time and money is a feature commonly reported among non-problem gamblers. The SLUGS may represent a useful brief single purpose screen for problem gambling and self-reported need for treatment	(Blaszczynski, Ladouceur et al. 2008)
Gambling Related Cognitions Scale	23 points on scale, focusing on expectancies, illusions of control, predictive control, inability to stop and interpretative bias. See http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CFcQFjAC&url=http%3A%2F%2Fwww.gamblingresearch.org%2Fdownload.php%3Fdocid%3D10436&ei=UEIeU4rOKsaVywOSsYG4Bg&usg=AFQjCNFzsU6hibQBOp2B2AA3fDOyyEjKiA&bvm=bv.62788935,d.bGQ for 23 points		(Emond and Marmurek 2010)
NLCLIP	Focuses on control, lying and preoccupation See http://www.easg.org/media/file/conferences/novagorica2008/thursday/1400-ses4/lepper_john.pdf	NLCLiP can, with reasonable accuracy, be employed to estimate the rate of prevalence of problematic and non-problematic (i.e. gambling which does not lead to significant endorsement of DSM-IV-MR-J criteria) in a general population of children. However, NLCLiP does not reliably discriminate between problem and at risk gamblers. Moreover, it does not provide a reliable basis to identify cases of problem gambling. The main conclusion reached is that NLCLiP is a potentially useful tool for regulators to assess changes in the prevalence of problematic and non-problematic gambling among children over time	(Lepper and Haden 2013)

Associations of gambling with other health conditions and lifestyle behaviours

One of the key challenges found by this review was the focus on establishing incidence and prevalence of problem gambling in defined populations, or the effectiveness of individualised treatment models to respond to problem gambling, with limited discussion in the peer reviewed articles of public health approaches, focusing on harm reduction and the prevention of adverse social, economic and health consequences of gambling.

A number of studies have explored the inter-relationships between problem gambling and other health conditions and lifestyle behaviours, focusing on the co-occurrence of problem gambling with other behavioural and psychological disorders.

Whilst the majority of studies have hypothesized the impact on health is negative, an American cross sectional study found that whilst problem/pathological gambling was uniformly associated with poorer health measures among both younger and older adults, recreational gambling was associated not only with some negative measures (eg obesity) but also with some positive measures (eg, better physical and mental functioning) in older populations.(Desai, Desai et al. 2007) A positive impact of recreational gambling on older people's health and wellbeing has also been found by other studies. (Caldarone, Dausey et al. 2004) Other studies which have looked at older people's gambling have found that correlates of at-risk gambling included increased physical and mental health disability, a smaller and less satisfying social network, and less transportation and money, (Lichtenberg, Martin et al. 2009), and that gambling may offer a forum of social support to older adults who are often isolated as they age. (Bilt, Dodge et al. 2004)

Alcohol use

A number of studies have investigated the associations between alcohol use and problem gambling. The results of these studies, by demonstrating that the two behavioural challenges can and do co-exist provide a rationale for screening for problem gambling when presenting with alcohol or substance misuse.

- A UK based study, utilising secondary analysis of participant data from the 2007 British Gambling Prevalence Survey (n = 9003 adults aged 16 years and above), showed that alcohol consumption as measured by the number of units drunk on the person's heaviest drinking day was not significantly associated with having gambled in the past year, and that alcohol consumption as measured by the number of units drank on the person's heaviest drinking day in the past year was significantly associated with problem gambling. (Griffiths, Wardle et al. 2010)
- A French study, which describes the results of a cross-sectional survey conducted in 1 week of 2009 in 55 French addiction treatment centres, found that problem gambling was a common feature of the French people with alcohol and drug disorders, and suggested that screening for problem gambling should be initiated on presentation for help on the grounds of substance or alcohol use. (Nalpas, Yguel et al. 2011)
- An American study, which focused on adolescent gambling behaviour, found that probable pathological gamblers report more daily and weekly alcohol consumption,

use more uppers, downers, and hallucinatory drugs, and smoke more cigarettes on a daily basis compared with non-gamblers, social gamblers, and gamblers at-risk for serious problems. Probable pathological gamblers similarly reported higher levels of state anxiety, trait anxiety, and social stress compared with non-gamblers, social gamblers, and at-risk gamblers. Adolescents with the highest state and trait anxiety scores had more severe gambling and substance abuse problems. (Ste-Marie, Gupta et al. 2006)

- The linkages between alcohol consumption, substance abuse and gambling have been considered in a number of studies. (McCready, Mann et al. 2008)
- Alcohol related 'myopia' was also found in an Australian study, which looked at player behaviour with a computerised blackjack programme, before and after ingesting alcohol. The online advice available to players was found to increase players' compliance with optimal play and willingness to wager more at high stakes, with players relying more on the online advice, and playing more quickly, following the consumption of alcohol. (Phillips and Ogeil 2007)

Tobacco use

Numerous epidemiological and clinical studies have found that tobacco use and gambling frequently co-occur. (Harper 2003; Brown, Phillips et al. 2004; Grant, Kim et al. 2008; Bottorff, Carey et al. 2009; McGrath and Barrett 2009; Griffiths, Wardle et al. 2010; Griffiths, Wardle et al. 2011; McGrath, Barrett et al. 2012)

- A UK based study, utilising secondary analysis of participant data from the 2007 British Gambling Prevalence Survey (n = 9003 adults aged 16 years and above), showed that: (i) cigarette smokers were significantly more likely to gamble in the past year compared to non-smokers, (ii) cigarette smokers were over three times more likely than non-smokers to be a problem gambler. (Griffiths, Wardle et al. 2010)
- An evaluation of callers to a gambling helpline reported that some 43% of problem gamblers calling the helpline reported daily tobacco smoking. Daily smokers also more frequently acknowledged depression and suicidality secondary to gambling, gambling-related arrests, alcohol and drug use problems, mental health treatment, and problems with casino slot machine gambling. The study concluded that there was a need for enhanced smoking cessation efforts in problem gamblers. (Potenza, Steinberg et al. 2004)
- A Canadian study, which performed a direct comparison of gambling and smoking behavioural variables found that there were significant associations between smoking, higher problem gambling scores, and use of alcohol/drugs. (McGrath, Barrett et al. 2012)

However, there is limited discussion of how smoking might affect gambling or vice versa. More research is needed focusing on the potential reinforcing properties of tobacco on the development and treatment of problem gambling.

Substance abuse

A number of studies note the co-occurrence of substance abuse and at risk gambling behaviours.

- A small scale American study found that substance-abusing recreational gamblers, as compared to non-substance-abusing ones, differed in gambling motivations, began gambling at earlier ages, reported heavier gambling, and preferred and performed strategic forms of gambling. (Liu, Maciejewski et al. 2009)
- An American study, which looked at problem gambling and violent behaviours in substance abusing women found that abusers with violent tendencies were about 3 times as likely as those without such tendencies to be problem gamblers, after controlling for socio-demographics. (Cunningham-Williams, Abdallah et al. 2007)
- A small scale US study (n=341) found that after controlling for gender, income, and site, gamblers with substance abuse treatment histories (SATH; 31%) had more severe problems than gamblers with no substance abuse treatment histories (NSATH) on the Gambling, Alcohol, Drug, Psychiatric, and Employment scales of the Addiction Severity Index. (Ladd and Petry 2003)

Mental health

A substantial portion of gamblers in treatment may have co-occurring mental health disorders including substance use disorders, especially alcohol dependency, personality disorders, affective disorders, anxiety disorders and impulse control disorders.(Westphal and Johnson 2007) However, robust estimates of the prevalence of co-morbidities are difficult to find, demonstrated by a literature review, focusing on pathological gaming prevalence and co-morbidity with mental health challenges which showed that prevalence estimates for pathological gambling disorders and comorbidity with other problems varied widely across the 33 studies included in the meta-analysis. (Ferguson, Coulson et al. 2011) A Scottish study, which looked at university students found that past-year probable pathological gamblers had significantly higher depression than problem gamblers, non-problem gamblers, and non-gambler, with female problem and probable pathological gamblers demonstrating particularly high depressive symptomatology, suggesting co-morbid depression may be a prominent feature of problematic female gambling. (Moodie and Finnigan 2006)

It would appear that there is sufficient weight of evidence showing an association between pathological gambling and suicide ideation to justify screening for gambling problems when assessing risk after suicide attempts and for suicide risk in patients presenting with gambling problems and co-morbid depression, alcohol abuse and a previous suicide attempt. (Battersby, Tolchard et al. 2006)

- A number of studies have shown that problem gambling can be associated with high rates of suicide ideation. (Maccallum and Blaszczynski 2003; Nower, Gupta et al. 2004; Ledgerwood, Steinberg et al. 2005; Battersby, Tolchard et al. 2006; Hodgins, Mansley et al. 2006; Penfold, Hatcher et al. 2006; Penfold, Hatcher et al. 2006;

Zangeneh and Hason 2006; Seguin, Boyer et al. 2010; Penney, Mazmanian et al. 2012) The causality is however contested.

- One small scale study (n=85), which investigated the nature of suicidal behaviour within problem gamblers, found that despite high rates of suicidal ideation, suicide plans and attempts within the sample group, no clear relationship could be observed between suicidality and indices of gambling behaviour. Depression rather than gambling specific characteristics, marital difficulties, or the presence of illegal behaviours were found to be related to the risk of suicidality. (Maccallum and Blaszczynski 2003)
- A small scale study of problem gamblers acknowledging gambling-related suicidality on calls to a gambling helpline found that those reporting gambling-related suicide attempts (n = 53; 21.5%) were more likely than those denying them (n = 193; 78.5%) to acknowledge gambling-related illegal behaviours, mental health and substance abuse treatment, and family histories of alcohol problems, and were less likely to report prior gambling treatment. (Ledgerwood, Steinberg et al. 2005)

Aggression

A number of studies have also reported linkages between gambling and increased aggressive behaviour. (Martins, Liu et al. 2013) A small scale phenomenological analysis of behaviours concluded that gambling-induced aggression is a manifestation of the underlying conflict of engaging in dysfunctional behaviour while consciously acknowledging its detrimental effects. (Parke and Griffiths 2005)

Adolescent gambling

A 2010 systematic review of the literature on gambling in adolescents concluded that:

(a) it is conducted by a relatively small group of researchers in Britain, Canada, and the United States;
(b) it is primarily prevalence-focused, quantitative, descriptive, school-based, and atheoretical;
(c) it has most often been published in the Journal of Gambling Studies;
(d) it is most often examined in relation to alcohol use;
(e) it has relatively few valid and reliable screening instruments that are developmentally appropriate for adolescents, and
(f) it lacks racially diverse samples. (Blinn-Pike, Worthy et al. 2010)

Our review of the literature confirms that these findings remain largely consistent today.

Prevalence and gambling behaviours

There are a number of studies which look at the prevalence of gambling in adolescent populations, commenting on the efficacy of existing screening tools to identify problem gambling in children and young populations. (Delfabbro and Thrupp 2003; Derevensky, Gupta et al. 2003; Brendgen, Ladouceur et al. 2004; Barnes, Welte et al. 2005; Bergevin, Gupta et al. 2006; Boudreau and Poulin 2007; Derevensky and Gupta 2007; Blinn-Pike, Worthy et al. 2010; Beutel, Dreier et al. 2012; Ariyabuddhiphongs 2013; Chiesi, Donati et al.

2013) Despite high variability of adolescent rates, there is consensus that adolescents are a high risk population for gambling related harms. A cluster-design study published in 2006, working with twelve schools from across Glasgow and North Lanarkshire (n= 2,043 youngsters aged between eleven and sixteen years of age (mean = 13.7) reported a 9.0%, prevalence of problem gambling within the study population, with a further 15.1% deemed to be at-risk gamblers. By far the most popular type of youth gambling was fruit machines, regardless of gambling group. (Moodie and Finnigan 2006)

A number of studies have suggested strong associations between problem gambling and other maladaptive behaviours. (Nower, Gupta et al. 2004; Derevensky, Gupta et al. 2005; Derevensky and Gupta 2006; Dickson and Derevensky 2006; Derevensky and Gupta 2007; Derevensky, Pratt et al. 2007; Dickson, Derevensky et al. 2008; Derevensky, Shek et al. 2010) These include increased experience of delinquent and criminal behaviour, disruption of familial and peer relationships. Poor academic and work performance (Deverensky and Gupta 2004), high rates of suicide ideation and suicide attempts (Nower, Gupta et al 2004), and a wide variety of mental health disorders. (Deverensky and Gupta 2004) There is also substantial evidence that problem gambling behaviour amongst adolescents, particularly males, seems to be part of a constellation of other antisocial, risk-taking, and delinquent behaviours include alcohol or substance use, physical violence, vandalism, and shoplifting.

Online gambling

The expansion of traditional and non-traditional forms of gambling, as well as the accessibility, convenience, availability, diversity, and proliferation of gambling opportunities, is indicative of its popularity and social acceptance, with an unprecedented growth in gambling opportunities and venues easily accessible to adolescents. Alongside this, increased availability, accessibility, and new technological forms of gambling (mobile and internet gambling) have capitalized upon the interests of adolescents.(Derevensky, Gupta et al. 2003; Derevensky, Gupta et al. 2005; Derevensky and Gupta 2006; Derevensky and Gupta 2007; Derevensky, Pratt et al. 2007; Turner, Macdonald et al. 2008; Derevensky, Sklar et al. 2010) A 2010 systematic review of adolescent online gambling concluded that young people appear to be very proficient in using and accessing new media and are likely to be increasingly exposed to remote gambling opportunities, and will therefore require education and guidance to enable them to cope with the challenges of convenience gambling in all its guises. (Griffiths and Parke 2010)

Such studies suggest there is a need for appropriate intervention strategies aimed at youth problem gamblers, possibly as early as twelve years of age.

Health risks associated with online gambling (not age specific)

The evidence around online gambling as a risk factor for developing problem gambling is limited. However, a number of studies have found that, compared with offline gamblers, online gamblers report more co-occurring risky behaviours, namely alcohol and cannabis use (Kairouz, Paradis et al. 2012), potentially harmful lifestyles (eg, drinking alcohol, smoking, using marijuana, using illicit drugs, and unhealthy body mass indices) (Shead, Derevensky et al. 2012), and experience adverse impacts on mental and physical health,

social relationships and academic performance, with online problem gambling being related to the time spent on the internet and gambling online, parental/peer gambling and binge drinking. (Yani-de-Soriano, Javed et al. 2012)

Contextual Factors

Familial exposures

A small scale qualitative study, which explored women's experiences of being involved with a problem gambler, found that the women were invariably victims of the problem gambler's activities, enablers of their gambling activities, and well positioned to provide informal help and care for the problem gambler. (Patford 2009) Studies have shown that problem gambling in females is strongly associated with having a close relative with gambling or alcohol problems. (Grant, Chamberlain et al. 2012)

Working in the Gambling Industry

A number of studies suggested that people working within the gambling industry exhibited higher rates of problem gambling.(Guttentag, Harrigan et al. 2012) Employees' gambling behaviours were found to relate to various workplace influences:

- Exposure to gambling; exposure to patrons; exposure to the work environment, and the existence of training, restrictions, and resources and employment variables (length of employment, previous industry experience, and department). (Hing and Breen 2008)
- A tendency to increase gambling involvement after commencing employment, and a pre-existing attraction to gambling as a factor in seeking the employment in that sector(Guttentag, Harrigan et al. 2012)
- Shiftwork has also been identified as a factor, but the evidence of its impact on gambling behaviour is contradictory, with one study finding that for some participants it promoted gambling behaviour (lack of alternative social opportunities, only gambling venues are open after late shifts, staff tend to socialise with other hospitality workers, social isolation, gamble to fill in time, and shiftwork makes it easier to hide heavy gambling), whereas others reported anti-social hours and late shifts protected them from developing gambling behaviours. (Hing and Breen 2008)

Prison health

Only one study was found which specifically tested the comparative utility of screening tools within a prison setting. This study was set in New Zealand and contrasted the EIGHT and SOGS screening assessment tools. It reported that the EIGHT tool was effective for use in a prison setting and that consequently it has been adopted for routine use by the Department of Corrections in New Zealand.(Sullivan, Brown et al. 2008)

A number of studies have looked at the prevalence of, and motivations for, gambling within prison settings. (May-Chahal, Wilson et al. 2012)

- A Canadian study showed that it was significantly correlated with social anxiety, depression, substance abuse, impulsiveness, and current and childhood attention-deficit/hyperactivity disorder (ADHD) symptoms in prison populations.(Preston, McAvoy et al. 2012)
- A qualitative Canadian study, undertaken with inmates from 3 prisons, found that gambling was seen as a good recreational alternative to boredom, but that, for some prisoners, it was also a tool to promote socialisation and/or even to protect themselves indirectly. (Beauregard and Brochu 2013)
- A literature review which had focused on problem gambling in prison populations, found that whilst the prevalence of gambling within correctional facilities appeared lower than in the general population, inmates who did gamble did so regularly, and the prevalence of problem gambling within this population was disproportionately high. The article concluded that there was a need for screening of prison populations, and greater vigilance in treatment. (Williams, Royston et al. 2005)

This resonates with a pilot study in the UK in 2011, which reported that risk and problem gambling rates amongst prisoners are significantly higher than the general population. Prisoners who take part in gambling are more likely to run into difficulties than gamblers in the general population. Offending could be reduced by 5% if gambling problems were effectively addressed. (Responsible Gambling Fund 2011) Links prisoners made between offending and their current crime included arguing with a partner and selling drugs to get money to gamble; stealing from family members to gamble; getting into fights over gambling and prostitution. In addition, respondents reported that it can sometimes lead to potentially violent confrontations between prisoners.

Despite reported high rates of gambling within prisoner and ex prisoner populations, there was limited literature on prison specific interventions to address gambling behaviours, or reports of systematic assessment and appraisal of gambling behaviours. In Canada, a voluntary project, which aimed to address prisoner attitudes towards gambling and gambling behaviours, reported that it shifted behaviours and attitudes within its study population by introducing a programme which consisted of the following topics:

1. definitions of addiction and gambling addiction, types of gambling, and facts about problem gambling;
2. phases and progression of problem gambling and the negative consequences of problem gambling;
3. external reinforcement of addiction and problem gambling through an outside speaker (two guest speakers from Gamblers Anonymous) or appropriate video, Gambling: It's Not About Money (Hazelden Foundation, 2000), followed by discussion of key points;
4. the reality of odds and characteristics of denial and cognitive distortions and false beliefs, called “mistaken thinking” in the program, and the realities behind such thinking, sometimes referred to as “myth-busting”;
5. identifying barriers to quitting problem gambling and ways of overcoming barriers, relapse triggers, and the development of a relapse prevention plan, including techniques for self-protection;
6. alternatives to gambling and the development of a lifestyle plan, a reminder of signs of problem gambling, and follow-up services for problem gamblers.

The results of the program point to the need for further prison gambling programs with follow-up after the inmates leave prison to measure the impact of gambling programs not only on attitudes but also on gambling behaviour after release. As well, with the inroads achieved on affecting gambling attitudes, stronger links to follow-up addiction counselling services for inmates leaving prison to build on the momentum achieved in prison were advocated. (Nixon, Leigh et al. 2006)

Exposure to gambling marketing

As gambling products have diversified so too have the ways in which the gambling industry has been able to target, reach and engage different sectors of the community. Understanding how different people and groups of people conceptualise and respond to gambling messages can be critical to developing effective responses.

There is limited localised literature on the effects of exposure to gambling marketing.

- A Canadian study, which utilised a convenience sample of radio, print and media advertisements to promote casino gambling, found that ads target audiences along age, gender and ethnic lines, mobilising excitement and sex as persuasive techniques to promote and normalise the view that casino gambling is a "new fun-tier" of the entertainment industry, comparable with going to the cinema. (McMullan and Miller 2010)
- A Canadian study which examined ads that aired on cable television in one Canadian jurisdiction over a six month period, to promote the view that on-line gambling is an entertainment experience in which skill prevails over luck, winning dominates losing, fantasy overshadows reality, leisure trumps work, and the potential for personal change eclipses the routines of everyday life. (McMullan and Miller 2008)
- A Swedish study found that advertising triggered impulses to gamble, but did not cause gambling. Advertising thus increased already high involvement in gambling and/or made it harder to stick to a decision to gamble less or not at all. (Binde 2009)

Age and gender both appear to have an impact on responses to gambling marketing.

- An American study which looked at youth exposure to commercial advertising on gambling found that teenagers had considerable exposure to commercial gambling advertising, and were able to decode for the most part, the gambling messages offered by advertisers, identifying themselves with the gambling experiences as they aged and well before they reached the age of majority.(McMullan, Miller et al. 2012)
- Whilst exposure to advertising by adolescents was found to be high, one Canadian study found that rather than inciting non-gamblers to being gamblers, advertisements appear to serve the function of maintaining established gambling habits, making them particularly problematic to youth who have already developed gambling habits. (Derevensky, Sklar et al. 2010)
- An Australian study found that male participants felt 'bombarded' and 'targeted' by sports bet marketing, whilst most women and older men actively resisted gambling marketing strategies. Older women, younger men, moderate and high risk gamblers and those from low socio-economic backgrounds were particularly influenced by incentivisation to gambling. (Thomas, Lewis et al. 2012)

One report which looked at the impact of advertising of gambling, including advertising placement in the media, point-of-sale displays, sports sponsorship, promotional products, celebrity endorsements, advertisements using internet and wireless technology, and content which may appeal to or mislead children, reported that adolescents are particularly attuned to gambling advertising, with high levels of recall. This report developed a series of recommendations in response to this challenge. (Monaghan, Derevensky et al. 2008) (see box 4)

Box 4 Recommendations for regulation of gambling Monaghan, Derevensky & Sklar: Impact of gambling. Journal of Gambling Issues: Issue 22, December 2008
Gambling advertisements should not be permitted to be shown during television and radio timeslots primarily accessed by children or adolescents or advertised where they may be frequently viewed by youth, including on billboards, on public transport, and in print publications where a prominent proportion of readership are minors. • Given the influence of point-of-sale advertising on children and adolescents, it is recommended that these advertisements be restricted from display in all stores entered by minors. • Companies and trusts that principally generate their revenue from gambling should be banned from promoting or advertising their name or products, including naming rights, branding, and logos through the sponsorship of sporting teams and events. • Products promoting gambling or gaming companies should not be manufactured in child sizes, be available for purchase by minors, or be given away in promotions or as prizes. • Gambling corporations should be restricted from utilising product endorsements from individuals who are likely to appeal to youth and increase the likelihood of youth gambling involvement. • Advertisement for both gambling and practice web sites should be subject to the same regulations described for advertisement of gambling products. In addition, free or practice sites should be prohibited from containing advertisements and direct links to online gambling sites and should have the same payout rates as their actual gambling site. • Online and wireless gambling companies should be prohibited from advertising via SMS alerts to mobile phones. • Advertisements for gambling products must contain accurate information regarding the chances of winning and a visible warning statement that highlights the potential risks associated with excessive gambling. • Gambling advertisements should not be allowed to include images or sounds of excessive spending. • Youth-oriented graphics, including animals and cartoons, music, celebrity promoters, and youth themes such as board games, and being cool, should not be used to market or advertise gambling products. • Gambling advertisements should not include or depict any individual who is or appears to be under the age of 25, to prevent youth from relating to individuals gambling or winning. • Regulations for gambling advertisements should be mandatory, enforced, and continually evaluated by an independent regulatory body.

It would appear that the focus of gambling messages in the public arena encourage widespread positive acceptance of gambling behaviours as exciting, enjoyable and legal entertainment, through the use of community wide mass media.

A 2014 review of research on gambling advertising identifies three broad fields of study – volume and efficiency, impact on problem gambling, and content and messages. The report,

which was commissioned by the Responsible Gambling Trust, examined 33 studies on gambling advertising, and concluded that it would be unrealistic to expect that general advertising restrictions would in themselves have a great preventive effect on problem gambling and that that "play responsibly" and warning messages embedded in gambling advertising would not greatly reduce the negative effects that advertising may have. (Binde 2014)

Social marketing and gambling

Potential roles for social marketing exist in the design and delivery of interventions tackling gambling behaviour, mitigating gambling harms, and informing public health framed approaches to targeted communication activities, which reframe gambling activity across the gambling behavioural continuum. However, there is limited information on the application of social marketing to addressing problem gambling, with many of the studies which purport to utilise social marketing approaches failing to satisfy the quality criteria proposed by the NSMC, an extensive consideration of which is beyond the scope of this report. Many of the extant projects and programmes described in the literature have tended towards social advertising, rather than providing a comprehensive social marketing programme targeted at behavioural change.

One 2010 qualitative study which looked at the behaviours of 100 gamblers with a range of gambling behaviours, found that gamblers believed that social marketing campaigns were heavily skewed towards encouraging individuals to take personal responsibility for their gambling behaviours or were targeted towards those with severe gambling problems, with dominant discourses about personal responsibility preventing them from seeking help and reinforcing perceptions of stigma. (Thomas and Lewis 2012)

These findings appear to resonate with a 2007 Canadian study which evaluated the role of social marketing in responding to youth gambling. This study recommended illustrating the basic facts of gambling using simple messages that raise awareness without making a judgement. Participants cautioned against the "don't do it" approach, suggesting it did not reflect the current youth gambling culture.(Messerlian and Derevensky 2007) As Binde concluded, it maybe that rather than trying to persuade young people that gambling is risky, they could be taught how to question and resist the messages in gambling advertising. (Lemarié & Chebat, 2013) (Binde 2014)

Discussion

What is effective in addressing problem gambling behaviour?

This literature review demonstrated the emphasis that has been placed in the literature on monitoring levels of gambling-related harm, focusing on measuring the prevalence of problem gambling and estimating how many problem gamblers there are, and the vast literature utilising a treatment model to respond to gambling. It demonstrated that, despite the growing literature base, studies which have considered the efficacy, effectiveness and outcomes of public health approaches to problem gambling are very limited in number. Against this context, determining the effectiveness of population level interventions to address problem gambling behaviour is effected by a series of systematic barriers: low sample sizes, lack of heterogeneous samples, lack of protocol driven treatments, single site

clinical trials, lack of replication of studies by independent investigators and high rates of nonspecific treatment response.

Much of the literature focuses on people who are already gambling, looking at prevalence, and attempting to explain behavioural patterns, with a lesser number of studies providing an overview of approaches undertaken to ameliorate existing gambling behaviours. Much of the literature available in this sphere is based on very small scale studies, with limited information available to suggest that the findings could be generalised to inform larger scale interventions.

A number of studies have attempted to identify risk markers for problem gambling behaviour. These include:

- (for online gambling) frequent and intensive betting combined with high variability across wager amount and an increasing wager size during the first month of betting. (Braverman and Shaffer 2012)
- (for gamblers working within gaming venues) close interaction with gamblers, frequent exposure to gambling, the influence of fellow employees, the influence of management, workplace stress, hours of work, and frequent exposure to gambling marketing and promotions. (Hing and Breen 2008)
- problem online poker players were (1) more likely to swap genders when playing online; (2) undisciplined and spent over their allocated budget; and (3) played more frequently for longer periods of time. Even though there is some skill involved in poker, skill was not a predictor in problem gambling.(Griffiths, Parke et al. 2010)
- Compared to non-problem gamblers, pathological gamblers were more likely to report experiencing big wins early in their gambling career, stressful life events, impulsivity, depression, using escape to cope with stress and a poorer understanding of random events. (Turner, Zangeneh et al. 2006)
- For adolescents lower family and school connectedness are associated with adolescent problem gambling. Further, an examination of the effect of potential protective factors on a set of risk factors predictive of adolescent problem gambling suggests that lack of family cohesion plays a role in predicting at-risk and problem gamblers. (Dickson, Derevensky et al. 2008)

Whilst these features may be helpful in identifying at risk players, the studies performed were small scale studies, with effects tracked within small sample sizes, and no information available to support a recommendation of generalisability, or evidence that the findings have been further explored within other research groups. Similarly, one discussion paper looked at the face validity of developing 'low risk limits' for gambling, (based on dollars spent, percentage of gross income spent on gambling and duration per session) which could be disseminated to the public. Whilst the limits proposed were found to have face validity, concerns were expressed that they could create a false sense of security among gamblers, encouraging people to gamble and difficulties in applying the limits across different forms of gambling. (Currie, Hodgins et al. 2008)

Against this context, this paper does not recommend any specific interventions for general role out. Rather it highlights those papers/interventions, which, within their small scale study, have reported findings or research directions which may be worth further exploration.

Specific interventions which may offer greater potential for consideration within a Scottish context have been highlighted throughout the discussion section.

Primary prevention interventions

In general terms, the literature demonstrates that an effective public health approach to problem gambling would:

- Embed problem gambling in public health policy, promoting responsibility of the gambling industry and communities, and not pathologisation of the gambler, recognising that the individual characteristics of the gambler are only one part of the problem and social and economic environments play a significant role in problematic gambling.
- Develop initiatives which are targeted to meet the specific needs of defined population groups, recognising that both age and gender are influential in gambling behaviour and patterns
- Integrate awareness and screening for problem gambling into substance abuse and other risky behaviour prevention programmes
- Develop awareness raising programmes for adults and adolescents, to improve knowledge and awareness of the risks and problems associated with gambling behaviours
- Develop self-help materials, recognising that many problem gamblers are reluctant to come forward for help
- Improve assessment and surveillance of problem gambling
- Ensure that effective evaluation is built into initiative development.

Improve assessment and surveillance

The prevalence survey included within the Scottish Health Survey is an important first step in monitoring the prevalence of gambling in Scotland. However, as this review demonstrated, there remain significant gaps in our knowledge and understanding of gambling and gambling related services. For example:

- **Additional information is required around the availability, utilisation and effectiveness of problem gambling services**
- **The number of tools to measure problem gambling, and the widespread usage of different tools, suggests there is a need to consider what would constitute a credible measure of problem gambling which incorporates the broader public health definition of harm**

Improving understanding of barriers to seeking help

For problem gamblers themselves, the most commonly reported barriers to seeking help were: wish to handle problem by oneself; shame/embarrassment/stigma; unwillingness to admit problem; and issues with treatment itself. Other frequently reported barriers included lack of knowledge about treatment options and practical issues around attending treatment.

A recurring theme was the need to support problem gamblers to help themselves, by supporting access to secondary prevention materials, particularly interventions that do not

require direct contact with a treatment agency, such as computerized summaries and self-help books. (Cunningham, Hodgins et al. 2008) These include written materials (eg self-help books and treatment manuals), audiotapes, videotapes, computer-based SHTs implemented on palmtop computers, desktop computers, via telephone (Interactive Voice Response systems--IVR) or via the internet and virtual reality applications. (Raylu, Oei et al. 2008)

A narrative analysis of approaches undertaken by 10 recovering problem gamblers demonstrated a reluctance to seek help through formal avenues. Key themes in the plot structures were: self-loathing and loss of identity; fear of failure, of the loss of the gambling experience, and of being judged; negotiation of control, being in control, and needing to be in control; changing based on insight, cognitive behavioural interventions, or integrative interventions; and finally, the shared narrative, with a common temporal journey beginning with self-help strategies, before moving into the professional spheres for further aid. (Nuske and Hing 2013) One study, which looked at the long term nature of recovery from pathological gambling promoted involvement in extending hope to other troubled gamblers as an integral part of the recovery process. (Nixon and Solowoniuk 2006)

In Sweden, a mutual support group methodology has been found to be effective in reducing gambling problems for adolescents and young adults, offering an alternative and complimentary programme to professional treatment. This small scale study of 69 problem gamblers (mostly males) found that problems ceased or lessened amongst most participants, with attendance at even a small number of meetings having a positive impact. (Binde 2012)

- **More research is needed on barriers to treatment-seeking experienced by subgroups of gamblers defined by culture, ethnicity, gender, age. (Suurvali, Hodgins et al. 2008; Suurvali, Cordingley et al. 2009; Suurvali, Hodgins et al. 2010; Suurvali, Hodgins et al. 2012; Suurvali, Hodgins et al. 2012)**

Informing intervention design through improving understanding of differences in health seeking behaviours

Research demonstrates that gambling support services often do not meet the needs of people seeking help for their gambling problems. In particular, the needs of cultural groups, and gender-specific needs of men and women are neglected. Understanding differences in help seeking behaviour can assist in developing early interventions to address gambling related problems and in developing effective strategies.

The key motivators for help seeking behaviours of family members of problem gamblers (through helplines, non-professional sources, and self-help measures) were concerns the gambling might become a major problem, negative emotions, problems maintaining normal daily activities, concerns for dependents' welfare, and health concerns. Barriers included wanting to solve the problem on their own, and shame. (Hing, Tiyce et al. 2013) (Clarke, Abbott et al. 2007) This highlights a need to target family members to raise their awareness of the support packages available, and thus to better equip family to assist both the person with gambling problems towards treatment and recovery and to protect their own physical, emotional, social and financial wellbeing.

There is a significant amount of evidence suggesting that gambling preferences are gendered, Moubarac, Shead et al. 2010; Stark, Zahlan et al. 2012) and reflect other social characteristics such as political preference, and age. For example, a Danish student study (Gausset and Jansbøl 2009) found that games of skill (such as poker or betting on football, horses, etc) tended to be the province of males, studying business and voting on the right of the political spectrum. In contrast, students who played games of change (lotto, bingo, etc) tended to be females, studying the social sciences, preferred savings rather than risky investments and voted on the left of the political spectrum.

However, the majority of studies looked at problem gamblers as a group, with limited information on gender specific interventions to support female problem gamblers specifically.

- **A small scale Canadian study, which looked at women's experiences of involvement with a 12-week all women treatment group, concluded that the women who participated in the group found women-only groups to be helpful and stated their preference for female-only treatment groups in the future. (Piquette and Norman 2013)**

A UK Study which looked at the support provided by on line support forums found that the forums were most popular with online gamblers, were found to be particularly helpful by female gamblers, and had a higher ratio of females to males (with gambling problems) than any other comparable service. (Wood and Wood 2009) Evaluation of a pre and post intervention of a new telephone and internet based treatment programme for pathological gamblers also found that this could significantly reduce symptoms of pathological gambling. (Myrseth, Brunborg et al. 2013)

- **Understanding differences in help seeking behaviour can assist in developing early interventions to address gambling related problems and in developing effective strategies. Consideration should be given to whether future research could/should be commissioned, drawing on the findings from the Scottish Health Survey, to investigate the help seeking behaviours of identified high risk populations.**

Public Education

A 2014 review of research on gambling concluded that it would be unrealistic to expect that general advertising restrictions would in themselves have a great preventive effect on problem gambling and that that "play responsibly" and warning messages embedded in gambling advertising would not greatly reduce the negative effects that advertising may have. (Binde 2014) This suggests there is a need for targeted information campaigns to increase awareness of the risks associated with gambling behaviours across the continuum, and a potential market for social marketing programmes to directly address gambling behaviours within segmented audiences.

Given that many gambling problems are related to not keeping to a limit on the amount of time or money spent playing, to believing that games can be controlled and that losses can be won back, there is scope to limit increases in the development of problematic behaviour by public education, especially when this can be targeted at groups who are known to be at risk.

Raising awareness in university age students

For university age students, there is a need to ensure access to consistent, evidence based advice. An American study which looked at the use of college counselling websites to promote consistent messages about problem gambling found that only 15% of the sample included any information on problem gambling and that messages about problem gambling were presented significantly less frequently than messages involving alcohol abuse, substance abuse, depression, anxiety/stress, and psychological struggles with food. (McKinley and Wright 2012) A Scottish study, which looked at student gambling, erroneous cognitions and awareness of treatment in Scotland, found that less than a fifth of students (n=1483) in the sample were aware of where to go to receive help for gambling-related problems. (Moodie 2008)

Improving adolescent understanding of risks:

Studies have found that problem gambling in adolescents is negatively correlated with the effectiveness of the adolescents coping skills and their understanding of random chance. (Turner, Macdonald et al. 2008) (Monaghan and Derevensky 2008) (Turner, Macdonald et al. 2008), with younger people underestimating the possible dangers of online gambling, often defining gambling and online gambling in terms of fun and gaming rather that fully appreciating the risks related to gambling. (Hume and Mort 2011) School-based prevention programs may be an important component of problem gambling prevention, but there is limited evidence of effective programmes.

- **A one hour intervention program which aimed to improve student understanding of random chance was very positively received by the student, producing a significant, but small improvement in the students' understanding. However, it did not provide any evidence for changes in gambling behaviour, coping strategies, or attitudes towards gambling. (Turner, Macdonald et al. 2008)**
- **A Canadian study which examined the influence of improved knowledge of odds and mathematical expectation on the gambling behaviour of university students, found that improvement in knowledge and skill was not associated with any decreases in actual gambling behaviour. (Williams and Connolly 2006)**
- **A Canadian intervention 'Stacked Deck' (a set of 5-6 interactive lessons that teach about the history of gambling; the true odds and "house edge"; gambling fallacies; signs, risk factors, and causes of problem gambling; and skills for good decision making and problem solving), which was delivered to 949 grade 9-12 students in 10 schools throughout southern Alberta found that four months after receiving the program, students in the intervention group had significantly more negative attitudes toward gambling, improved knowledge about gambling and problem gambling, improved resistance to gambling fallacies, improved decision making and problem solving, decreased gambling frequency, and decreased rates of problem gambling. (Williams, Wood et al. 2010)**

Whilst these studies demonstrated that gambling-specific prevention programmes and gambling and related skills workshops can have an impact on reducing misconceptions and increasing knowledge about gambling, a lack of long-term follow-ups and of behavioural

measures makes it difficult to draw any clear conclusions about the effectiveness of such programmes. (Ladouceur, Goulet et al. 2013) However a potential implication may be that enhanced mathematical knowledge on its own may be insufficient to change gambling behaviour.

Improving general awareness of gambling in children and adolescents

For children and adolescents, there is evidence from interventions aiming to improve awareness around drugs, alcohol and related problematic behaviour that:

- **targeting parenting classes could be effective in increasing outreach and awareness raising.**
- **families can be contributors to the development of problematic behaviour, the identification of emerging problems, and supporting young people to face up to their problems.**
- **A Canadian study found that there were significant gender differences in parental attitudes to their children's gambling. (Shead, Derevensky et al. 2011)**
- **Canadian parents may view adolescent gambling as a relatively unimportant issue compared to other potentially risky behaviours. Parental attitudes toward youth gambling, their knowledge and awareness of youth gambling prevention programs, and their gambling behaviours with their children suggest that gambling has become normalized, with few parents being aware of the potential seriousness of youth gambling. (Campbell, Derevensky et al. 2011)**
- **In a Canadian study, mothers were also more likely to report having conversations with their children about gambling and to be more aware of educational materials to which their children are being exposed. (Shead, Derevensky et al. 2011)**

Whilst no evidence of these findings being replicated by other studies were found, there may be grounds, given that other studies have shown that gambling is a gendered activity, to incorporate specific policies to address gender specific attitudes and behaviours within interventions which involve parents.

A number of Canadian studies identified the need for school staff (particularly psychologists) to be upskilled in relation to adolescent gambling, suggesting this is comparatively ignored by schools, but is nevertheless a significant cause of serious mental health consequences and impeded academic progress. (Dickson and Derevensky 2006) A Canadian study, which looked at knowledge levels, found that whilst teachers were generally aware of the issues, they were not able/willing to devote time to prevention of gambling. (Ladouceur, Ferland et al. 2004) A German 2 wave cluster RCT found that a 90-minute lesson about gambling can improve gambling knowledge and change attitudes toward gambling and gambling behaviour among adolescents. Studies with a longer follow-up period are needed to test the long-term effects of such an intervention. (Walther, Hanewinkel et al. 2013) No studies were found that considered the role of schools in addressing adolescent gambling in the UK.

- **In conclusion, the evidence would seem to support the development of integrated, skills based learning, rather than simply focussing on issue-specific packages and programmes. The potential opportunities provided by Curriculum for Excellence would seem to be one area meriting further**

exploration in Scotland. Consideration should be given to making links to the Youth Health Programme of work being taken forward by NHS Health Scotland with strategic partners, focusing particularly on the development of strength based approaches, culture change, awareness and prevention of gambling behaviours and gambling related harms.

Investigate the potential of applying learning from other areas

Many of the definitions of gambling behaviour focus on gambling as a maladaptive response to external circumstances. This suggests that gambling may be acting, for some, as a prop, in the same way as alcohol and food can be utilised as a prop.

- **Consideration should be given as to whether some of the mechanisms proposed in the alcohol field, for example, such as restricting the availability of alcohol, tightening marketing rules, and providing tougher measures to protect the young, may be equally effective in curtailing gambling behaviours.**

Secondary Prevention interventions

One of the key features of secondary prevention interventions are that they have the potential to curb excessive play.

Support skills development initiatives

Whilst recognising that there is a tension between harm reduction and profit maximisation, some studies have looked at the potential for identifying problem gambling and potentially risky behaviour in situ, before the individual seeks assistance. (Delfabbro, King et al. 2012) However, the low number of studies , with limited evidence of replicablity through other studies confirming the findings, lack of long term follow up of sample groups and limited behavioural measures within the studies make it difficult to evaluate the effectiveness of the described programmes and interventions. (Ladouceur, Goulet et al. 2013)

Based on the limited evidence available, consideration could be given to improving the knowledge levels of managers of gaming establishments through:

- **Provision of reliable, consistent information on government policies and processes; deeper information about their communities and their values; and relevant information enabling managers to identify problem gamblers and assess the efficacy of responsible gambling practices. (Breen 2005)**
- **Supporting improved interaction between gambling venues and local gambling help agencies to provide assistance to patrons with gambling problems and the way that venue staff respond. (Hing and Nuske 2011)**
- **Addressing apparent gaps in relevant staff skills and responsible gambling training, particularly the barriers to providing appropriate assistance to problem gamblers, and best practice examples. The barriers to seeking assistance included: patrons feeling shame; issues of confidentiality; and lack of awareness of help available at gaming venues. (Hing and Nuske 2011)**

- **Provision of awareness training sessions on responsible gambling, which has been found to increase employee knowledge about gambling and improve their attitudes regarding gamblers, with schedules for additional information to be made available (refresher courses, posters, brochures, videos) to keep employees well informed. (Giroux, Boutin et al. 2008)**

A number of studies have considered the potential for GPs to take a more active role in identifying and managing problem gambling. (Goodyear-Smith, Arroll et al. 2006; Goodyear-Smith, Arroll et al. 2009) (Sullivan, McCormick et al. 2007; Tolchard, Thomas et al. 2007; Corney 2011; Sanju and Gerada 2011) In general terms, these studies found that patients were happy for GPs to take an active interest in their gambling. The Lie=Bet questionnaire was identified as a potential screening tool to utilise in a GP setting.

- **However, lack of confidence in talking about gambling was raised as a concern for GPs. This could be addressed through structured CPD sessions. (Corney 2011)**

Legislative approaches

Prohibiting specific gambling activities eg internet gambling, seem to be insufficient approaches to change gambling behaviour. Supply reduction might need to be enhanced by changes in game characteristics and implementation of early intervention measures. (Ludwig, Kraus et al. 2012)

Regulators have extensively used warning signs in many health domains to enhance knowledge and shift attitudes and behaviours to reduce associated harm. The effectiveness of these signs is influenced by their physical attributes and content. Gambling warning signs traditionally focus on the following: informing individuals of the potentially risky outcomes of gambling and the odds of winning, encouraging gambling within affordable limits, and advertising counselling services. The limited evidence suggests that warning signs for gambling attract attention and improve knowledge but are generally ineffective in modifying players' thoughts and behaviours. (Monaghan, Blaszczynski et al. 2009) A second study by Monaghan, which looked at the optimal content of warning signs, concluded signs designed to encourage players to reflect on, appraise, evaluate, and self-regulate their actions have greater theoretical and empirical support, and that warning signs should promote the application of self-appraisal and self-regulation skills rather than the simple provision of information on odds and probabilities to maximize their effectiveness as a public health tool. (Monaghan and Blaszczynski 2009)

- **This would seem to imply that In terms of gambling related harm and public health then there should also be more focus on policy and protecting people from the extraordinary growth in gambling opportunities in our communities and online.**

Self Exclusion

A number of reports were identified looking at a 'self-exclusion' process. (Napolitano 2003; Nower and Blaszczynski 2006; Blaszczynski, Ladouceur et al. 2007; LaBrie, Nelson et al. 2007; Ladouceur, Sylvain et al. 2007; Townshend 2007; Nower and Blaszczynski 2008; Tremblay, Boutin et al. 2008; Faregh and Leth-Steensen 2009; Nelson, Kleschinsky et al. 2010; Hayer and Meyer 2011; Hayer and Meyer 2011; Hing and Nuske 2012) This places the onus for providing safe gambling on the gambling venues. They concluded that this can be an effective treatment tool for the group of clients who have the extreme difficulty controlling their gambling in other ways.

Key factors to be considered include the initial educational intervention, establishing links and a gateway for access to supplementary services and monitoring and reporting the effectiveness of the overall programme. One study, which focused on the experience of people registering for self- exclusion with a centralised self-exclusion service, identified key program shortcomings as low publicity, limits on how many venues clients could self-bar from, and inadequate venue monitoring for breaches of self-barring orders. Nevertheless, the centralised service, staffed by trained psychologists and located away from gaming venues, which allows multiple venue barring in one application, appeared advantageous over programs that require people to self-exclude directly from individual gaming venues. Most respondents (85%) had ceased or lessened their gambling in the 12 months following self-barring. Nevertheless, some continued to struggle to manage their gambling, reflected in breaches of their orders and gambling in venues from which they were not excluded. (Hing and Nuske 2012)

- **Limiting access to gaming opportunities by vulnerable populations would be an effective public health intervention. Further consideration could be given to working with local government, communities and gaming venues to reduce access to gambling opportunities for vulnerable populations, eg adolescents.**

Tertiary Prevention

Internet based approaches to address problem gambling

Many studies highlighted the reluctance of problem gamblers to access formal treatment. Factors contributing to this low service utilization rate included geographical and time constraints, a desire to self-manage problems, shame, denial and concerns over privacy/confidentiality. The Internet can be an effective medium for the delivery of health-related information, self-assessment, counselling, peer-based support and other therapeutic intervention.

A number of small scale studies were identified which suggested that the internet and online automated tailored interventions may have a key role to play as a treatment delivery option for addressing problem gambling, as an alternative means to access treatment for gamblers reluctant to pursue traditional options. (Cooper 2003; Wood and Griffiths 2007; Carlbring and Smit 2008; Wood and Wood 2009; Monaghan and Wood 2010; Gainsbury and Blaszczynski 2011; Carlbring, Degerman et al. 2012; Hedman, Ljotsson et al. 2012; Hodgins, Fick et al. 2013; Rodda, Lubman et al. 2013) The rationale for this was consistent across all the

studies: the internet is highly accessible, and seeking professional help online allows clients to maintain privacy and anonymity, thus reducing fears of stigma, shame and guilt that may act as a barrier to treatment.

Examples of interventions which have shown to produce short term benefit include the Check your Gambling Screener (Cunningham, Hodgins et al. 2012) and Youth Bet (Korn, Murray et al. 2006) However, a study which looked at the overall quality of web-based information on gambling found that, whilst gambling-related education websites for patients were common, their global quality was poor. The study concluded there is a need for useful evidence-based information about gambling on the web. (Khazaal, Chatton et al. 2008)

- **Given the high number of problem gamblers who do not ever seek professional support, such interventions offer scope for accessing difficult to reach target audiences, and for the provision of 'on demand' advice. A series of recommendations has been developed by Monaghan et al (see https://www.problemgambling.ca/en/documents/internettreatmentforproblemgamblingcamh2009_final.pdf) which may provide a checklist for consideration if the development of such a scheme is considered to be a priority.**

Inequalities and Gambling

The focus of the literature review undertaken for this report was on identifying evidence of effective public health interventions. It did not focus specifically on identifying evidence of inequalities in relation to gambling behaviours.

However, there is evidence suggesting that spatial patterns of gambling provision (and support for gamblers) have important implications for accessing the relationship between gambling accessibility and gambling related harms. For example, a New Zealand national study found reported that neighbourhood access to opportunities for gambling is related to gambling and problem gambling behaviour, and contributes substantially to neighbourhood inequalities in gambling over and above-individual level characteristics. (Pearce, Mason et al. 2008) A UK study, which looked at gambling machine density found a significant correlation between areas characterised as high density machine zones(HDMZ) (one or more gambling machine per hectare) and socio-economic deprivation. The study found HDMZ had greater levels of income deprivation, more economically inactive people and a younger age profile than other areas. (Wardle, Keily et al. 2014) Similarly, a longitudinal study in the USA (596 students recruited from nine neighbourhood schools, re–surveyed at age 21- 22) found that those living in moderate and highly disadvantaged neighbourhoods were significantly more likely to be past year gamblers than those living in low disadvantaged neighbourhoods. (Martins, Storr et al. 2013) A report by the London Health Inequalities Network, which focused on betting shops, similarly concluded that there has been a limited interface between the licensing of betting shops and practice of protecting and promoting the health of local residents. (Hanrahan S. 2013)

Many of the studies identified in this report have found demographic differences in gambling participation. These findings are also reflected in the Scottish Health Survey, where an

association between gambling and socio-deprivation was found, with sex[4], area deprivation[5], GHQ12 status[6] and AUDIT score[7] all significantly associated with problem gambling in Scotland. However, whilst the association between area deprivation and problem gambling highlights the potential for gambling to contribute further to existing health inequalities within deprived areas, and thus increase existing vulnerability to harm, it is important to also note the increasing prevalence of gambling behaviour generally. This highlights the need to take a full spectrum approach to gambling behaviours, rather than focusing on problem gambling alone to ensure that appropriate action is taken to mitigate risks at all levels, and avoid increasing vulnerability to gambling related harms.

- **Public health specialists have a key role to play in the future development of policy, harm prevention and treatment strategies to ensure that adequate account is taken of population risks and needs in relation to gambling treatment and prevention alongside discussions about licensing and regulation of gambling premises and activities.**

Areas where additional research may be helpful

Role of regulation as part of an overarching risk and prevention strategy

- **Whilst it is beyond the scope of this paper to make recommendations for general roll out, it would appear that there is a strong case to be made for an overview of the regulatory frameworks for gambling within Scotland, to consider whether the broad range of powers in relation to regulation and fiscal accounting could be used to secure a broader based public health approach to gambling behaviours for the population.**

The development of online gambling and expansion of access to gambling opportunities has significant implications for existing regulatory mechanisms, revenue collection and community welfare. It is arguable that current approaches to tackling gambling related harms do not provide a strong enough over-arching risk and prevention strategy which locates the entire population along a continuum of gambling risk. A report in Australia, which looked at re-regulating gambling, concluded that in many cases the regulation of the gambling industry was essentially process rather than impact driven.(Hancock L. 2010) This report suggested that a public health approach to regulation could be considered, which focused on

- adopting the precautionary principle with new re-regulation and legislation;

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[4] The odds of being a problem gambler were 11.6 times higher among men than women.

[5] Those living in Scotland's most deprived areas (SIMD Quintile 1) had increased odds (Odds Ratio of 6.9) of being a problem gambler than those in the least deprived areas (SIMD Quintile 5).

[6] The odds of being a problem gambler were 5.6 times higher among those with a GHQ12 score of 4+ than those with a score of 0.

[7] Those with an AUDIT score of 20 or more (indicating harmful patters of alcohol consumption) were more likely to be problem gamblers; odds were 7.1 times higher among this group than those with an AUDIT score of 0.

- promoting socially responsible gambling by using legislated conditions of licence to operate strategically to protect consumers and gaming industry employees from risk and harm;
- mandated codes of practice (sanctions for the equivalent of 'serving the product to intoxicated persons'); and
- impact analysis: location and accessibility to gambling matter; mapping geospatial patterns of gambling (losses and help-seeking); tracking of particular product impacts.

This approach could be considered in Scotland.

Needs Assessment

- **Consideration should be given to gathering additional information around the availability, utilisation and effectiveness of problem gambling services in Scotland, particularly focusing on their accessibility to different audiences, eg adolescents. Many studies highlighted the reluctance of problem gamblers to access formal treatment. Factors contributing to this low service utilization rate included geographical and time constraints, a desire to self-manage problems, shame, denial and concerns over privacy/confidentiality.**

Concluding remarks

The literature review identified the emphasis within the literature on understanding the incidence and prevalence of gambling within specified population groups, consideration of gambling technologies and deregulation issues, and the impact of technology on gambling, highlighting salient factors in the rise of internet gambling (i.e. accessibility, affordability, anonymity, convenience, escape immersion/dissociation, disinhibition, event frequency, associability, interactivity, and simulation .

However, there was less emphasis on effective interventions to protect and promote the public's health. Whilst understanding of the risks associated with problem gambling is increasing, there remains a dearth of evidence around effective systematic steps to overcome this issue. Broader acceptance of this issue as a public health concern and the development of early intervention programs, effective regulation and social responsibility policies, standardized screening in care provider settings and education programs aimed at communicating the risks of gambling to ensure that the potential for harm is minimized and that those who need help can get help will support progress in this arena. (Wardle, Griffiths et al. 2012)

Appendix 1: Search Strategy (to be inserted by SCOTPHN)

Literature Search - Record of Search Strategy

Search question: How does gambling affect UK society? What are the impacts on various populations eg adolescents, deprived communities?	
User name: ScotPHN / Ann Conacher	**Staff name:** Charis Miller
RefWorks Link: http://www.refworks.com/refshare2?site=019201056686400000/19751340976336906/ScotPHN%20Gambling%20UK	

Databases

Database Used:	**Search Date(s):**	**Date Range:**	**Limits / Filters:**
Medline	04/09/2013	2008-2013	English

Search Strategy:

Database: Ovid MEDLINE(R) Daily Update <September 03, 2013>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) <1946 to Present>

Search Strategy:

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1 exp Gambling/ or exp pathological gambling/ (3406)

2 (gambling or gaming or betting or roulette or "national lottery" or bingo or scratchcard* or casino or fixed-odds or "football pools").ti,ab. (5231)

3 1 or 2 (5888)

4 great britain/ or exp channel islands/ or exp england/ or exp london/ or exp northern ireland/ or exp scotland/ or exp wales/ (297872)

5 (Britain or UK or England or English or Scotland or Scottish or Wales or Welsh or Ireland or Irish or "united kingdom").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier] (2198879)

6 4 or 5 (2211277)

7 exp Health Status Disparities/ (7608)

8 exp Poverty Areas/ or exp Poverty/ (31362)

9 exp Adolescent/ (1612827)

10 exp Ethnic Groups/ or exp Minority Groups/ (121089)

11 (socio-economic or socioeconomic or poverty or "health ineqaul*" or depriv* or teen* or adolescen* or "young people" or BME or "ethnic minorit*" or "minority ethnic" or "ethnic group*").ti,ab. (359412)

12 exp Social Class/ or exp Socioeconomic Factors/ (341115)

13 7 or 8 or 9 or 10 or 11 or 12 (2085904)

14 3 and 6 and 13 (159)

15 limit 14 to yr="2008 - 2013" (93)

16 limit 15 to english language (47)

****

Database Used:	Search Date(s):	Date Range:	Limits / Filters:
Embase	04/09/2013	2008-2013	English

Search Strategy:

Database: Embase <1996 to 2013 Week 35>

Search Strategy:

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1 exp pathological gambling/ or exp gambling/ (4087)

2 (gambling or gaming or betting or roulette or "national lottery" or bingo or scratchcard* or casino or fixed-odds or 'football pools').ti,ab. (5502)

3 1 or 2 (6274)

4 exp United Kingdom/ (210700)

5 (Britain or UK or England or English or Scotland or Scottish or Wales or Welsh or Ireland or Irish or "united kingdom").mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (533605)

6 4 or 5 (533605)

7 exp poverty/ (22698)

8 exp health disparity/ (6384)

9 exp socioeconomics/ (126429)

10 exp social class/ (15679)

11 exp ethnic group/ (171396)

12 adolescent/ (740254)

13 (socio-economic or socioeconomic or poverty or "health ineqaul*" or depriv* or teen* or adolescen* or "young people" or BME or "ethnic minorit*" or "minority ethnic" or "ethnic group*").ti,ab. (316671)

14 7 or 8 or 9 or 10 or 11 or 12 or 13 (1118608)

15 3 and 6 and 14 (76)

16 limit 15 to (english language and yr="2008 - 2013") (56)

****

Database Used:	**Search Date(s):**	**Date Range:**	**Limits / Filters:**
PsychINFO	04/09/2013	2008-2013	

Search Strategy:

S1	DE "Gambling" OR DE "Pathological Gambling" OR DE "Pathological Gambling"	Search modes - Boolean/Phrase	Display
S2	TI gambling or gaming or betting or roulette or "national lottery" or bingo or scratchcard* or casino or fixed-odds or 'football pools'	Search modes - Boolean/Phrase	6,023
S3	S1 OR S2	Search modes - Boolean/Phrase	7,400
S4	(DE "Poverty" OR DE "Poverty Areas" OR DE "Social Deprivation") AND (DE "Socioeconomic Status" OR DE "Family Socioeconomic Level" OR DE "Income Level" OR DE "Lower Class" OR DE "Social Class" OR DE "Health Disparities")	Search modes - Boolean/Phrase	891
S5	DE "Minority Groups" OR DE "Racial and Ethnic Groups" OR DE "Racial and Ethnic Attitudes" OR DE "Racial and Ethnic Differences" OR DE "Ethnic Identity"	Search modes - Boolean/Phrase	54,823

S6	TI (socio-economic or socioeconomic or poverty or "health ineqaul*" or depriv* or teen* or adolescen* or "young people" or BME or "ethnic minorit*" or "minority ethnic" or "ethnic group*") OR AB (socio-economic or socioeconomic or poverty or "health ineqaul*" or depriv* or teen* or adolescen* or "young people" or BME or "ethnic minorit*" or "minority ethnic" or "ethnic group*")	Search modes - Boolean/Phrase	252,280
S7	S4 OR S5 OR S6	Search modes - Boolean/Phrase	289,993
S8	TI (Britain or UK or England or English or Scotland or Scottish or Wales or Welsh or Ireland or Irish or "united kingdom") OR AB (Britain or UK or England or English or Scotland or Scottish or Wales or Welsh or Ireland or Irish or "united kingdom") OR SU (Britain or UK or England or English or Scotland or Scottish or Wales or Welsh or Ireland or Irish or "united kingdom")	Search modes - Boolean/Phrase	169,776
S9	S3 AND S7 AND S8	Search modes - Boolean/Phrase	62
S10	S3 AND S7 AND S8	Limiters - Publication Year: 2008-2012 Search modes - Boolean/Phrase	

Database Used:	**Search Date(s):**	**Date Range:**	**Limits / Filters:**
Web of Science	04/09/2013	2008-2013	Article, review

Search Strategy:

# 32 5	#3 AND #2 AND #1 Refined by: Publication Years=(2010 OR 2013 OR 2012 OR 2011 OR 2009 OR 2008) Databases=SCI-EXPANDED, SSCI Timespan=All years
# 44	#3 AND #2 AND #1

4	Databases=SCI-EXPANDED, SSCI Timespan=All years
# 3 293,020	Topic=(socio-economic or socioeconomic or poverty or "health ineqaul*" or depriv* or teen* or adolescen* or "young people" or BME or "ethnic minorit*" or "minority ethnic" or "ethnic group*") OR Title=(socio-economic or socioeconomic or poverty or "health ineqaul*" or depriv* or teen* or adolescen* or "young people" or BME or "ethnic minorit*" or "minority ethnic" or "ethnic group*") Databases=SCI-EXPANDED, SSCI Timespan=All years
# 2 318,146	Topic=(Britain or UK or England or English or Scotland or Scottish or Wales or Welsh or Ireland or Irish or "united kingdom") OR Title=(Britain or UK or England or English or Scotland or Scottish or Wales or Welsh or Ireland or Irish or "united kingdom") Databases=SCI-EXPANDED, SSCI Timespan=All years
# 1 24,033	TS=(gambling) OR TI=(gambling or gaming or betting or roulette or "national lottery" or bingo or scratchcard* or casino or fixed-odds or 'football pools')

Database Used:	**Search Date(s):**	**Date Range:**	**Limits / Filters:**
ProQuest	04/09/2013	2008-2013	

Search Strategy:

(ti(gambling OR gaming OR betting OR roulette OR "national lottery" OR bingo OR scratchcard* OR casino OR fixed-odds OR "football pools") OR ab(gambling OR gaming OR betting OR roulette OR "national lottery" OR bingo OR scratchcard* OR casino OR fixed-odds OR "football pools")) AND (ti(socio-economic OR socioeconomic OR poverty OR "health ineqaul*" OR depriv* OR teen* OR adolescen* OR "young people" OR BME OR "ethnic minorit*" OR "minority ethnic" OR "ethnic group*") OR ab(socio-economic OR socioeconomic OR poverty OR "health ineqaul*" OR depriv* OR teen* OR adolescen* OR "young people" OR BME OR "ethnic minorit*" OR "minority ethnic" OR "ethnic group*")) AND (ti(Britain OR UK OR England OR English OR Scotland OR Scottish OR Wales OR Welsh OR Ireland OR Irish OR "united kingdom") OR ab(Britain OR UK OR England OR English OR Scotland OR Scottish OR Wales OR Welsh OR Ireland OR Irish OR "united kingdom"))

Database Used:	**Search Date(s):**	**Date Range:**	**Limits / Filters:**

Cochrane	04/09/2013	2008-2013	

Search Strategy:

Search Name: Gambling ScotPHN UK

Date Run: 04/09/13 11:56:48.586

Description:

ID Search Hits

#1 MeSH descriptor: [Gambling] explode all trees 171

#2 gambling:ti,ab,kw (Word variations have been searched) 373

#3 #1 or #2 373

#4 MeSH descriptor: [Great Britain] explode all trees 4915

#5 Britain or UK or England or English or Scotland or Scottish or Wales or Welsh or Ireland or Irish or "united kingdom":ti,ab,kw (Word variations have been searched) 17041

#6 MeSH descriptor: [Scotland] explode all trees 399

#7 MeSH descriptor: [England] explode all trees 1728

#8 {or #4-#7} 17352

#9 (#3 and #8) from 2008 to 2013 7

Database Used:	**Search Date(s):**	**Date Range:**	**Limits / Filters:**
Google / Google Scholar			

Search Strategy:

- UK society gambling effect
- UK gambling poverty
- UK gambling teenagers
- UK gambling young people

- UK gambling ethnic minority
- UK gambling deprivation

Database Used:	Search Date(s):	Date Range:	Limits / Filters:
The Knowledge Network	04/09/2013		
Search Strategy: Author: Reith, G Keyword: gambling			

Appendix 2: Abbreviations utilised in report

Table 2: Abbreviations	
Abbreviation	Meaning
DSM IV	American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders IV
DSM V	American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders V
PGSI	Problem Gambling Severity Index
PG	Problem Gambling
GMS	Gambling motivation scale
DIGS	Diagnostic interviews for gambling severity

Appendix 3: Overview of literature

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
(Novotna) Note: copy of dissertation was requested but has not been (Ferguson, Coulson et al. 2011)forthcoming.	a case study of two treatment programs that provide services to populations with concurrent mental health and substance use problems and gambling problems. Both programs are organized as part of the Centre for Addiction and Mental Health in Toronto.	Existing treatment programmes	identified four key factors in the process of establishing integrated treatment for concurrent disorders as a standard practice. First, changes in public perceptions of mental health, substance use and gambling problems are associated with subsequent shifts in federal and provincial policies and mandates. Second, the need to conform to the public's expectation for more cost-effective services has brought challenges in providing comprehensive client-centered care. These challenges are exacerbated by the increased reliance on technically-driven cost efficiency when planning treatment outcomes. Third, on the micro level, the endorsement of evidence-based practices is mutually related to internal structuring and specialization of care. Lastly, the institutionalization of integrated treatment is associated with individual involvement by social

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
			actors and their pursuit of personal and professional interests.
(Bulcke) A copy of the dissertation has been requested, but not received.	The Gamblers Anonymous 20 Questions and the South Oaks Gambling Screen were the two instruments used in this study to measure gambling severity.	Interview study only. No intervention defined. The findings suggest that women gamblers in this study have sought help from both formal and informal help systems. Key barriers to treatment are psychosocial issues. The women reported significant issues of comorbidity and concurrent life stressors, which may have important clinical in implications providing appropriate and effective treatment to women addicted to gambling.	Barriers to treatment were identified within 3 broad domains: individual, socio-environmental and programmatic issues. Correlations among the three barriers subscales were positive and statistically significant. Individual barrier items were identified most often and programmatic barriers were identified least often. The barrier item "gamble to deal with the stress of daily life" was most frequently endorsed. Respondents who received formal treatment reported statistically more barriers and had higher individual and socio-environmental barrier subscale scores than non-formal treatment seekers.
Population responses to exposures to gambling marketing			
(McMullan, Miller et al. 2012)	analysed a sample of 50 youth in six focus groups between the ages of 13 and 18 to examine the process by which youth perceived, received or rejected the form and content of advertising and to determine what these ads meant to their social identities.	Concluded that socially responsible advertising for youth protection should be heterogeneous and not assume that all youth are alike or will be influenced by single messages.	found that youth had considerable exposure to commercial gambling advertising, decoded for the most part, the gambling messages offered by advertisers and identified themselves with the gambling experiences as they

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
			aged and well before they reached the age of majority. Also found that about one-third of gambling advertisements were not received by youth as intended and were ignored, not understood or rejected. The youngest age cohort (13–14) were the most likely to evince a social distance from the tone, style or look that many older youth found attractive in the ads and the least likely to identify themselves with the cultural capital of gambling such as social friendship, economic gain and fun and entertainment.
(Thomas, Lewis et al. 2012)	Semi-structured, qualitative interviews conducted with 100 adults in Victoria, Australia, who had gambled at least once during the previous year	Participants described the multi-layered ways in which gambling was marketed and were concerned about the role of marketing in 'normalizing' gambling for some groups.	Male participants felt 'bombarded' and 'targeted' by sports bet marketing. Most women and older men actively resisted gambling marketing strategies. Older women, younger men, moderate and high risk gamblers and those from low socio-economic backgrounds were particularly influenced by incentivisation to gambling.
(Derevensky, Sklar et al. 2010)	Based upon a previous qualitative study a questionnaire ascertaining adolescents' awareness of gambling advertisements and their impact upon their behaviour was developed and administered to 1,147 youth between the ages of 12 and	Rather than inciting non-gamblers to begin gambling, advertisements appear to serve the function of maintaining established gambling habits and were particularly problematic to youth with gambling	The findings suggest that almost all youth report being exposed to advertising with many individuals indicating being bombarded with messages, especially through pop-up ads viewed on the

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
	19.	problems.	Internet. Sixty-one percent of youth reported receiving spam gambling advertisements by e-mail and 96% had seen TV advertisements for gambling. The underlying perceived message is that winning is easy, the chance of winning is high and that gambling is an easy way to become wealthy. While most youth are dismissive of the messages and are aware of the risks associated with gambling, a large percentage of youth report that these messages prompt them to gamble.
(Wood and Griffiths 2004)	A questionnaire constructed by the authors was administered to a sample of 1195 adolescents between the ages of 11 and 15 years (550 male, 641 female, 4 unspecified). Data was analysed using the theory of planned behaviour		Results revealed that young people's attitudes are an accurate predictor of their gambling behaviour on these activities, and that social cognitive theory provides an explanation of how these attitudes may develop.
(Burnett, Bault et al. 2010)	This study investigated adolescent males' decision-making under risk, and the emotional response to decision outcomes, using a probabilistic gambling task designed to evoke counterfactually mediated emotions (relief and regret). Participants were 20 adolescents (aged 9–11), 26 young adolescents (aged 12–15), 20 mid-adolescents (aged 15–18) and 17 adults (aged 25–35).	Risk taking behaviour is highest at age 14. continuing development of the emotional response to outcomes may be a factor contributing to adolescent males' risky behaviour.	The ability to maximize expected value improved with age. However, there was an inverted U-shaped developmental pattern for risk-seeking. The age at which risk-taking was highest was 14.38 years. Although emotion ratings overall did not differ across age, there was an increase between childhood and young adolescence

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
			in the strength of counterfactually mediated emotions (relief and regret) reported after receiving feedback about the gamble outcome
Motivations for gambling			
(Clarke and Clarkson 2009)	A questionnaire consisting of demographic items, questions about gambling behaviour, the past year Revised South Oaks Gambling Screen (SOGS-R), the General Health Questionnaire (GHQ-12) and the Gambling Motivation Scale (GMS), was completed by a convenience sample of 104 older adults (65+ years) who gambled for money	The results were discussed in terms of activity theory and findings from comparable studies with older and younger gamblers. Health professionals and researchers need to consider risk factors for problem gambling among older adults' choices of social activities	Frequency of gambling, number of activities, largest amount spent in a single session and parents' gambling were significantly associated with problem gambling, but not psychological distress. Hierarchical regression analysis showed that beyond these situational variables, motivation explained approximately 12% of the variance in SOGS-R scores. Unique motivational predictors of problem gambling were stimulation and a motivation (meaninglessness).
(Felsher, Derevensky et al. 2010)	1,324 adolescents and young adults, age 17–22 years completed self-report measures on gambling behaviours, gambling severity, and childhood maltreatment.	The importance of routine assessments for childhood trauma, in addition to other psychological disorders and co-morbid addictive behaviours in individuals presenting with a gambling disorder may well facilitate more effective treatment strategies	Problem gamblers reported high levels of childhood maltreatment as compared with non gamblers and social gamblers. The results highlight the inter-relationship between multiple types of childhood abuse and gambling severity
(Turner, Macdonald et al. 2008)	Secondary data analysis	Problem gambling was negatively correlated with the effectiveness of coping skills and the student's	Participation was strongly tied to age, with only 39% of grade 5 students reporting gambling and

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		understanding of random chance. The study also found an interaction between coping skills and knowledge, suggesting that the combination of poor coping skills and a poor understanding of random chance are particularly important in understanding adolescent problem gambling. In general the students understood that gambling was mostly a matter of luck, however, the students had a very poor understanding of random chance.	over 80% of grade 11 reporting gambling. A large percentage of the gambling involvement was on non-commercial private bets such as card games, dice games, sports bets and games of skill. Interestingly most students rated gambling as less enjoyable than most other activities including reading.
(McMullan and Miller 2010)	This study examines print, radio, television and point of sale casino ads that aired in Canada. Using quantitative and qualitative methods we analyse a convenience sample of 367 ads that aired or were printed in 2005 and 2006.	casino advertising evinces troubling similarities with some of the factors that research has shown contributes to at-risk gambling: the association between spatial segregation, stepping out of real life and the development of dissociated states; between excitement, sensation seeking and the potential to develop vertigo and disorientation and between the entertainment of the games, the devaluation of money and the propensity to chase losses	ads target audiences along age, gender and ethnic lines and mobilize excitement and sex as persuasive techniques to promote the view that casino gambling is the “new fun-tier” of the entertainment industry where visiting a casino is as normal as going to a movie and where winning, glitz and gracious living prevail over losing, work and everyday life
(Williams, Connolly et al. 2006)	University students from southern Alberta (n = 585) were administered a questionnaire to assess their gambling behaviour.	The characteristics that best differentiated problem gamblers from non-problem gamblers were more positive attitudes toward gambling, ethnicity (41% of Asian gamblers were problem gamblers), university major (kinesiology, education, management), superior ability to calculate gambling	Seventy-two percent reported gambling in the past 6 months, with the most common types being lotteries and instant win tickets (44%) and games of skill against other people (34%). Most students who gambled spent very little time and money doing so

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		odds, and older age	(median time spent = 1.5 hrs; median amount of money spent = $0). While gambling is an innocuous activity for most, a significant minority of students are heavy gamblers who experience adverse consequences from it. Seven and one-half percent of students were classified as problem or pathological gamblers, a rate significantly higher than in the general Alberta adult population.
Health co-morbidities and risky behaviour co-occurences			
(McGrath, Barrett et al. 2012)	Direct comparison of non smoking and smoking behaviour, gambling behaviour, reasons for gambling. Chi-square analyses were used to compare groups on demographic variables. Associations between smoking status and gambling criteria were assessed with a series of binary logistic regressions. The data for this study came from the 2005 Newfoundland and Labrador Gambling Prevalence Study. Gamblers identified as non-smokers (N = 997) were compared with gamblers who smoke (N = 622) on numerous gambling-related variables.	The findings suggest an association between smoking and potentially problematic gambling in a population-based sample. More research focused on the potential reinforcing properties of tobacco on the development and treatment of problematic gambling is needed.	Results: The regression analyses revealed several significant associations between smoking status and past 12-month gambling. Higher problem gambling severity scores, use of alcohol/drugs while gambling, amount of money spent gambling, use of video lottery terminals, and reasons for gambling which focused on positive reinforcement/reward and negative reinforcement/relief were all associated with smoking.
(Martins, Tavares et al. 2004)	Seventy-eight female and 78 male pathological gamblers admitted to an outpatient treatment program were	Investigations of risky behaviours must consider both gender and age	Females attempted more suicide than males. Men had more sexual risky behaviour and alcohol abuse

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	compared regarding a profile of risk-taking behaviours (suicide attempts, illegal activities meant to finance gambling, sexual risky behaviour, and alcohol abuse). The Schedules for Clinical Assessment in Neuropsychiatry (SCAN), the Barratt Impulsiveness Scale version I I (BIS-11), and an adaptation of the HIV Risk Behaviour Scale were used.		than women. Younger age and depression were risk factors for suicide attempts, younger age and impulsivity were risk factors for illegal activities. Younger age was a risk factor for sexual risky behaviour, and no risk factor other than male gender was found for alcohol abuse.
(Desai, Desai et al. 2007)	Using cross-sectional data from the National Epidemiologic Survey on Alcohol and Related Conditions (N=43,093), the authors examined associations between gambling (categorized as non-gambling, recreational gambling, or problem/pathological gambling) and health and functioning measures stratified by age (40-64 years and ≥65)	Longitudinal studies are needed to clarify the relationship between gambling and health in older adults in the context of healthy aging.	Problem/pathological gambling was uniformly associated with poorer health measures among both younger and older adults. Among younger respondents, poorer health measures were also found among recreational gamblers. However, among older respondents, recreational gambling was associated not only with some negative measures (eg, obesity) but also with some positive measures (eg, better physical and mental functioning).
(Battersby, Tolchard et al. 2006)	Seventy-nine people with a diagnosis of pathological gambling received a mail out survey that included questions on postulated risk factors for suicidal ideation and behaviour, the modified Suicide Ideation Scale (SIS), the South Oaks Gambling Screen (SOGS), the Beck Depression Inventory (BDI) and the CAGE.	Counselling services, general practitioners and mental health services should screen for gambling problems when assessing risk after suicide attempts and for suicide risk in patients presenting with gambling problems and co-morbid depression, alcohol abuse and a previous suicide attempt.	A total of .54.4% of the surveys were returned completed. There were 81.4% who showed some suicidal ideation and 30.2% reported one or more suicide attempts in the preceding 12 months. Suicidal ideation and behaviours were positively correlated with the gambling severity (SOGS scores), the

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			presence of debt attributed to gambling, alcohol dependence and depression (BDI). Suicidal ideation/behaviour was not significantly associated with gender and living arrangements, nor a history of receiving treatment for depression during the preceding 12 months.
(Rigbye and Griffiths 2011)	In August 2009, a total of 327 letters were sent to all Primary Care Trusts, Foundation Trusts and Mental Health Trusts in the UK requesting information about problem gambling service provision and past year treatment of gambling problems within their Trust under the Freedom of Information Act.	Provision of localised, specific treatment for gambling disorders is not universal	Results showed that 97% of the Trusts did not provide any service (specialist or otherwise) for treating those with gambling problems (i.e., only nine Trusts provided evidence of how they deal with problem gambling). Only one Trust offered dedicated specialist help for problem gambling. There was some evidence that problem gamblers may get treatment via the NHS if that person has other co-morbid disorders as the primary referral problem. Current provision for problem gamblers in Great Britain is delivered overwhelmingly by the third sector..
(Ferguson, Coulson et al. 2011)	Thirty three published studies and doctoral dissertations were analysed in meta-analysis. Prevalence rates and comorbidity with other mental health problems were examined according to measurement method.	Diagnostic analogies with pathological gambling may produce spuriously high prevalence estimates, potentially over identifying non-pathological players as pathological. Diagnostic approaches focused on the interfering nature on	Prevalence estimates and comorbidity with other problems varied widely between studies. Measurement which attempted to replicate “pathological gambling” approaches produced higher

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		other life needs and responsibilities may have greater validity and utility.	prevalence estimates and lower comorbidity estimates than methods which focused on the interfering nature of pathological gaming. The most precise measures produce an overall prevalence rate of 3.1%
(Nehlin, Grönbladh et al. 2013)	Data were collected among psychiatric outpatients with mainly mood (47%) and anxiety (35%) disorders. A questionnaire package was distributed, including AUDIT (Alcohol Use Disorders Identification Test), DUDIT (Drug Use Disorders Identification Test), tobacco items, and gambling items. Two major drinking categories were formed: "Non-hazardous alcohol use" (NH) and "Alcohol use above hazardous levels" (AH)	Alcohol and drug use, smoking, and gambling are all highly prevalent among psychiatric outpatients. Young females are in particular need of attention. Interventions should be tailored for co-occurring psychiatric disorders and applied within routine psychiatric care.	In total, 2160 patients (65% females) responded to the questionnaire package. The AH rate was high among psychiatric outpatients (28.4%), particularly among young females (46.6%). Young female patients also reported a high prevalence of problematic drug use (13.8%). Problematic drug use, daily smoking, and problematic gambling were frequent. The unhealthy habits were linked to AH.
(Shead, Hodgins et al. 2008)	A total of 513 undergraduate students (females = 344, males = 170; mean age = 22.1) who gamble in some form at least two times per month completed an online questionnaire	Demonstrates link with alcohol abuse	62.2 per cent (n = 319) of the respondents reported playing poker for money in the past year. A logistic regression analysis showed that poker players were more likely to be male, younger, have higher scores on an index of alcohol abuse, spend more time gambling and gamble more frequently compared to non-poker players. A second logistic regression showed that

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			online/casino poker players were more likely to be male, have higher scores on an index of problem gambling, spend more time and money gambling, and gamble more often compared to social/non-poker players
(Liu, Maciejewski et al. 2009)	Logistic regression analyses were performed on data from a nationally representative sample from the Gambling Impact and Behaviour Study.	findings suggest the need for additional research on whether and how substance use might promote gambling and vice versa.	Substance-abusing recreational gamblers, as compared to non-substance-abusing ones, differed in gambling motivations, began gambling at earlier ages, reported heavier gambling, and preferred and performed strategic forms of gambling.
(Kairouz, Paradis et al. 2012)	Respondents were 8,456 offline gamblers and 111 online gamblers who participated in a population-based survey conducted in the province of Québec, in 2009. The study sample is representative of adult general population	Compared with offline gamblers, online gamblers report more co-occurring risky behaviours, namely alcohol and cannabis use.	There is an unequal distribution of online gambling in the population. A disproportionate number of men, young people, and students say they participate in online gambling. Poker players are overrepresented among online gamblers and gambling behaviours tend to be more excessive on the Internet.
(Phillips and Ogeil 2007)	Twenty adult men (aged 18-46) completed the South Oaks Gambling Screen (SOGS; H.R. Lesieur & S. B. Blume, 1987) and the Alcohol Use Disorders Identification Test (AUDIT; J. P. Allen, D. F. Reinert, & R. J. Volk, 2001) and then played a computer blackjack program before and after	The authors explained these results in terms of an alcohol-induced myopia that enhances responses to salient cues.	The decision aid (online Basic advice) increased players' compliance with optimal play and also increased players' willingness to wager more at high stakes. Participants attained a mean peak blood alcohol concentration (BAC) of 0.048%.

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	ingesting alcohol.		Alcohol increased the rate of play. After consuming alcohol, participants appeared to spend less time on their decisions and were more reliant on support.
(Rash, Weinstock et al. 2011)	Using latent growth modeling, weekly alcohol use trajectories of treatment-seeking pathological gamblers were examined across 36 weeks, allowing rates of change to differ across the 12-week pre-treatment, during-treatment and post-treatment periods. For these secondary data analyses, drinking gamblers (N = 163) from a combined sample of two randomized clinical trials for the treatment of pathological gambling were used	Although some reduction in alcohol use was noted after treatment entry, a substantial proportion of the sample continued at risk drinking after treatment entry.	Results indicated a decrease in alcohol use corresponding with treatment entry and maintenance of less drinking during treatment and post-treatment. Despite these decreases in alcohol use overall, 31% (50 of 163) of participants exhibited risky drinking during the treatment or post-treatment periods. Gender, age, at-risk drinking (at any point in the 36-week interval), baseline gambling severity, treatment condition, and gambling during treatment predicted latent alcohol use growth factors.
Help seeking behaviours			
(Hing, Tiyce et al. 2013)	This paper explores help-seeking by CSOs of problem gamblers and their related motivators and barriers. A telephone interview was administered to 48 CSOs who called an Australian gambling helpline seeking assistance for themselves and/or a person with gambling problems	Findings highlight the need to better equip family members/significant others to assist both the person with gambling problems towards treatment and recovery and to protect their own physical, emotional, social and financial wellbeing.	Key motivators for seeking help (through helplines, non-professional sources, and self-help measures) were concerns the gambling might become a major problem, negative emotions, problems maintaining normal daily activities, concerns for dependents' welfare, and health concerns. Barriers included wanting to solve the problem on

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			their own, and shame.
(Ledgerwood, Arfken et al. 2013)	prospectively examined treatment initiation and its predictors among individuals calling a state help-line. Participants (n=143) were assessed shortly after their initial call and re-contacted at least two months later.	Enhanced counselling focusing on motivational factors may result in better treatment engagement for some problem gamblers.	Overall 67% of the re-contacted help-line callers had attended at least one treatment session at the time of the follow-up interview (92.7% formal treatment and 28.1% peer-support meetings). Multivariate analysis revealed that gambling-related financial difficulties and past treatment for problem gambling (but not for mental health or substance abuse) predicted treatment initiation.
(Cunningham, Hodgins et al. 2012)	Pilot study reporting on initial usage of online screening tool. The online CYG screener was linked to two existing Web pages for gambling in Ontario, Canada—the Ontario Problem Gambling Helpline (OPGH)Web page and ProblemGambling.ca.	More work is needed to establish whether the online CYG screener can motivate reductions in gambling among participants or motivate treatment-seeking in those requiring assistance in addressing problematic gambling behaviour.	While more participants used the ProblemGambling.ca (n = 730) version than the OPGH version (n = 591), the OPGH version appeared to be more targeted, as almost all of the participants using this Web site were Canadian (and the personalized feedback of the current version of the CYG is generated using Canadian norms)
(Ibáñez, Blanco et al. 2003)	69 consecutive individuals with DSM-IV pathological gambling (47 men and 22 women) applying to a specialized outpatient treatment program were evaluated with structured interviews, self-report questionnaires, and psychological scales.	Male and female pathological gamblers had similar gambling severity and overall rates of psychiatric comorbidity. However, male pathological gamblers had higher rates of alcohol abuse/dependence and antisocial personality disorder, whereas women had higher rates of affective disorders and history of	67% of men (N=26) versus 25% of women (N=5) had been exposed to gambling in adolescence. Women had a later age at first bet and a faster evolution of the disorder. Female pathological gamblers were more likely to play bingo, whereas men tended to prefer slot machines.

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
		physical abuse	
(Nuske and Hing 2013)	narrative analysis of in-depth interviews relating the help-seeking behaviour of 10 recovering problem gamblers.	A common temporal sequence moved from self-help, professional and nonprofessional help, then returned to self-help, in a journey that emphasised the importance of their sharing of narratives.	Key themes in the plot structures were: self-loathing and loss of identity; fear of failure, of the loss of the gambling experience, and of being judged; negotiation of control, being in control, and needing to be in control; changing based on insight, cognitive behavioural interventions, or integrative interventions; and finally, the shared narrative.
(Heater and Patton 2006)	Qualitative study, evaluating usage of 24 hour gambling helpline. A total of 97 callers (59 men and 38 women) were asked 34 questions.	Female callers reported a shorter duration of their gambling problem compared to male callers.	Male and female callers had similar background demographics and had both experienced numerous financial, relationship, and work problems as a result of their gambling
(Grant, Chamberlain et al. 2012)	501 adult subjects (n = 274 54.7%] females) with DSM-IV pathological gambling presenting for various clinical research trials over a 9-year period were assessed in terms of socio-demographics and clinical characteristics. A subset (n = 77) had also undertaken neuropsychological assessment with the Stop-signal and set-shift tasks	Understanding variations in disease presentation in men and women is clinically important as differences may reflect biological and sociocultural factors and have implications for selecting appropriate prevention and treatment strategies	PG in females was associated with significantly worse disease severity, elevated mood and anxiety scores, and history of affective disorders, later age of study presentation, later age of disease onset, and elevated risk of having a first-degree relative with gambling or alcohol problems. These findings were of small effect size (0.20-0.35). Additionally, PG in females was associated with proportionately more non-strategic gambling with medium effect size (0.61). In

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			contrast, PG in males was associated with a significantly greater lifetime history of an alcohol use disorder and any substance use disorder (small effect sizes 0.22-0.38
(Suurvali, Hodgins et al. 2010)	Literature review – ten studies only found into help seeking behaviour	Awareness and educational materials could incorporate messages that might encourage heavy gamblers to make changes before harms became too great. Intervention development could also benefit from more research on the motivators leading to successful (vs. failed) resolution, as well as on the ways in which disordered gamblers are able to overcome specific barriers to seeking help or reaching resolution.	Help-seeking occurred largely in response to gambling-related harms (especially financial problems, relationship issues and negative emotions) that had already happened or that were imminent. Resolution was often motivated by the same kinds of harms but evaluation/decision-making and changes in lifestyle or environment played a more prominent role. Self-exclusion was motivated by harms, evaluation/decision-making and a wish to regain control.
(Wood and Griffiths 2007)	The evaluation utilised a mixed methods design in order to examine both primary and secondary data relating to the client experience of using GAMAID online advice and guidance service. In addition, the researchers posed as problem gamblers in order to obtain first-hand experience of how the service works in practice. A total of 80 participants completed an online evaluation questionnaire, and secondary data were gathered from 413 distinct clients who	Service was particularly popular with females	Found to be very accessible to all clients and internationally acceptable.

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
	contacted an advisers		
(Khazaal, Chatton et al. 2008)	Evaluation of the quality of web-based information on gambling. The key words: gambling, pathological gambling, excessive gambling, gambling problem and gambling addiction were entered into two popular search engines: Google and Yahoo. Websites were assessed with a standardized proforma designed to rate sites on the basis of "accountability", "presentation", "interactivity", "readability" and "content quality". "Health on the Net" (HON) quality label, and DISCERN scale scores aiding people without content expertise to assess quality of written health publication were used to verify their efficiency as quality indicators.	While gambling-related education websites for patients are common, their global quality is poor. There is a need for useful evidence-based information about gambling on the web.	Of the 200 links identified, 75 websites were included. The results of the study indicate low scores on each of the measures. A composite global score appeared as a good content quality indicator.
(Moodie 2008)	Rates of probable pathological gambling in colleges and universities across Scotland were investigated with a nationally distributed sample consisting of students (n = 1,483) and members of staff (n = 492). Gambling-related erroneous cognitions (Gambling Beliefs Questionnaire GBQ]) and gambling severity (South Oaks Gambling Screen SOGS]) were measured, with additional questions enquiring about awareness of treatments available for gambling problems	Less than a fifth of students were aware of where to go to receive help for gambling-related problems	Rates of past-year problem and probable pathological gambling for students were 4.0% and 3.9%, respectively. An exploratory factor analysis of the GBQ resulted in a 24-item five-factor model, with gambling severity (as indicated by SOGS scores), indices of increasing gambling involvement (gambling frequency and number of gambling activities), and male gender being positively correlated with higher levels of erroneous cognitions, suggesting erroneous cognitions may not be prominent for females with gambling

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			problems.
Adolescent gambling/proposed interventions			
(Moodie and Finnigan 2006)	A cluster-design involved the distribution of questionnaires to youngsters in a classroom setting, with twelve schools from across Glasgow and North Lanarkshire participating in the research. A total of 2,043 youngsters aged between eleven and sixteen years of age (mean = 13.7) participated in the study. Two questionnaires were employed in the study, with the first being designed by the authors to investigate types, frequency and correlates of gambling, and the second being the DSM-IV-J (Fisher, 1992)..	The high rates of problem and at-risk gambling clearly highlights the popularity of gambling in modern society and moreover the need for appropriate intervention strategies aimed at youth problem gamblers, possibly as early as twelve years of age.	The prevalence of problem gambling in this study was 9.0 percent, with a further 15.1 percent deemed to be at-risk gamblers. By far the most popular type of youth gambling was fruit machines, regardless of gambling group
(Martins, Liu et al. 2013)	This study examines the association between aggressive/disruptive behaviour development in two distinct developmental periods—childhood (i.e., Grades 1–3) and early adolescence (i.e., Grades 6–10)—and subsequent gambling behaviour in late adolescence up to age 20. The sample consists of 310 urban males of predominately minority and low socioeconomic status followed from first grade to late adolescence. Separate general growth mixture models were estimated to explore the heterogeneity in aggressive/disruptive behaviour development	Aggressive/disruptive behaviour development in childhood and early adolescence is associated with gambling and gambling problems in late adolescence among urban male youth. Preventing childhood and youth aggressive/disruptive behaviour may be effective to prevent youth problem gambling	There was no association between childhood behaviour trajectories and gambling involvement. Males with a moderate behaviour trajectory in adolescence where two times more likely to gamble compared to those in the low stable class (OR = 1.89, 95% CI = 1.11, 3.24). Those with chronic high trajectories during either childhood or early adolescence (OR = 2.60, 95% CI = 1.06, 6.38; OR = 3.19, 95% CI = 1.18, 8.64, respectively) were more likely to be at-risk/problem gamblers than those in the low class.

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
(Williams, Wood et al. 2010)	School-based prevention programs are an important component of problem gambling prevention, but empirically effective programs are lacking. Stacked Deck is a set of 5-6 interactive lessons that teach about the history of gambling; the true odds and "house edge"; gambling fallacies; signs, risk factors, and causes of problem gambling; and skills for good decision making and problem solving. An overriding theme of the program is to approach life as a "smart gambler" by determining the odds and weighing the pros versus cons of your actions. A total of 949 grade 9-12 students in 10 schools throughout southern Alberta received the program and completed baseline and follow-up measures. These students were compared to 291 students in 4 control schools.	These results indicate that Stacked Deck is a promising curriculum for the prevention of problem gambling.	Four months after receiving the program, students in the intervention group had significantly more negative attitudes toward gambling, improved knowledge about gambling and problem gambling, improved resistance to gambling fallacies, improved decision making and problem solving, decreased gambling frequency, and decreased rates of problem gambling. There was no change in involvement in high risk activities or money lost gambling.
(Walther, Hanewinkel et al. 2013)	A two-wave cluster randomized control trial with two arms (intervention vs. control group) was conducted in the German Federal State of Schleswig-Holstein. The intervention group received a four-unit media education program, which contained one unit on gambling. The program was implemented by trained teachers during class time. The control group attended regular classes without any specific intervention. Survey data from 2,109 students with a mean	A 90-minute lesson about gambling can improve gambling knowledge and change attitudes toward gambling and gambling behaviour among adolescents. Studies with a longer follow-up period are needed to test the long-term effects of such an intervention.	Thirty percent of the sample reported lifetime gambling; 6.7% were classified as current gamblers. Results of multilevel mixed-effects regression analyses revealed significant program effects in terms of an increased gambling knowledge (d = .18), decreased problematic gambling attitudes (d = .15), as well as a decrease of current gambling (d = .02) in the intervention group

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
	age (SD) of 12.0 (.85) years was collected before and shortly after the intervention		compared to the control group. The program had no significant influence on lifetime gambling.
(Binde 2012)	Pilot study – a mutual support group in Sweden for young problem gamblers During the study period, 116 weekly meetings occurred, usually involving six to ten participants; in total, 69 problem gamblers (66 male and three female), aged 17–25, and 23 partners and friends attended the meetings.	This mutual support group provides relatively effective help to adolescents and young adults with gambling problems, offering a valuable alternative and complement to professional treatment.	Gambling problems ceased or lessened among most participants in ten or more meetings. In some cases, attending just one or a few meetings had a positive impact on the problems.
(Williams and Connolly 2006)	A group of 198 students in an introductory statistics class received instruction on profbability theory using examples from gambling. A comparison group of 134 students received generic instruction on probability, and another group of 138 students in classes on unrelated topics received no mathematical instruction	The implication of this research is that enhanced mathematical knowledge on its own may be insufficient to change gambling behaviour.	Students receiving the intervention demonstrated superior ability to calculate gambling odds as well as resistance to gambling fallacies 6 months after the intervention. Unexpectedly, this improvement in knowledge and skill was not associated with any decreases in actual gambling behaviour
(Korn, Murray et al. 2006)	A youth working group spent several months designing the look and feel of the YOUTHBET site to ensure that it would appeal to youth aged 10-19. In total, 34 youth from the Greater Toronto Area participated in the first 3 phases of the usability testing of the site using Video Capture of User Site Interaction methodology	Involvement of youth in designing website for youth	Youth participants indicated that they liked the interactive way gambling information was presented via realistic games and quizzes, often citing that YouthBet.net would be a fun and educational tool to be used by teachers in the classroom. Participants had no difficulties navigating the site, finding content and playing games. Additionally, all youth said that they would

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
			return to the site and would recommend it to a friend if they were having a problem with gambling
(Messerlian and Derevensky 2007)	A qualitative study through the use of focus groups was conducted to explore adolescents' exposure to existing prevention campaigns and their message content and communication strategy preferences for a youth gambling social marketing campaign	Participants caution against the "don't do it" approach, suggesting it does not reflect the current youth gambling culture.	Participants prefer that youth gambling ads depict real-life stories, use an emotional appeal and portray the negative consequences associated with gambling problems. They further recommend illustrating the basic facts of gambling using simple messages that raise awareness without making a judgement.
(McKinley and Wright 2012)	203 College Counselling Websites (CCW) in America were selected to assess how frequently they provided any information about problem gambling, as well as the specific types of communications CCWs offered on this topic.	Given the prevalence of problem gambling among college students, as well as the value that college students place on information provided on CCWs, it is important that internal web sites offer more information concerning this issue.	Results showed that CCWs rarely included any messages about problem gambling. Specifically, only 15% of all CCWs contained information about problem gambling. Furthermore, messages about problem gambling were presented significantly less frequently than messages involving alcohol abuse, substance abuse, depression, anxiety/stress, and psychological struggles with food.
(Delfabbro, Lahn et al. 2005)	cross-sectional study of 926 young people (years 7-12, age 11-19) attending State, independent and Catholic schools in the Australian Capital Territory (ACT). The aim of the study was to describe the prevalence of gambling and problem	suggests the need for tighter controls over access to lottery products, greater consumer information in schools to educate young people about the risks of gambling, as well as additional ethnographic research to	mong ACT adolescents and to obtain insights into the social context in which gambling was occurring. Survey results showed that 70% of adolescents had gambled in the previous 12

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
	gambling among ACT adolescents and to obtain insights into the social context in which gambling was occurring.	obtain further insights into how young people gain access to gambling opportunities	months and 10% at least weekly. Approximately 4% of adolescents could be described as problem gamblers based upon the DSM-IV-J classification with males and young people from indigenous backgrounds found to be more significantly affected. Most adolescent gambling in the ACT was undertaken either privately or conjunction with others (usually parents or peers),
(Splevins, Mireskandari et al. 2010)	A self-administered battery of questionnaires was distributed to 252 students aged 12-18 years, attending four private schools in the Eastern suburbs of Sydney, Australia. The battery included a self-administered socio-gambling demographic questionnaire, the Diagnostic and Statistical Manual Fourth Edition Multiple Response Juvenile (DSM-IV-MR-J) diagnostic instrument to assess problem gambling status, the Gambling Attitudes Scale, and questionnaires using a Likert scale to measure gambling-related harms and help-seeking behaviours	Few adolescents are able to recognise when gambling is problematic	The study found further support for previous findings suggesting that a significant proportion of young people meet criteria for problem gambling, that males are at-risk and that few adolescents are able to recognise when gambling is problematic or access mental health professionals for assistance.
problem gambling (general population)			
(Myrseth, Brunborg et al. 2013)	Pre and post intervention evaluation of a new telephone and Internet based treatment programme for pathological gamblers. The participants (N = 112) were problem gamblers who were either	Provides tentative support for using internet and telephone based interventions	The results suggest that using Internet and telephone-assisted treatment interventions can significantly reduce symptoms of pathological gambling (measured

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	self-referred or referred by their general practitioner. Data from post-treatment and 3-month follow-up are evaluated. SOGs utilised.		by the South Oaks Gambling Screen—Revised). The intervention was also associated with improvement on cognitive distortions, measured by the Gamblers Belief Questionnaire, and general psychological distress and psychopathology as measured by the Symptom Checklist-90-Revised.
(Muñoz, Chebat et al. 2013)	A cohort of 103 actual gamblers who reported previous gambling activity on VLT's on a regular basis were utilised to assess the effectiveness of graphic warnings vs. text-only warnings and the effectiveness of two major arguments (i.e., family vs. financial disruption). A 2 × 2 factorial design was used to test the direct and combined effects of two variables (i.e., warning content and presence vs. absence of a graphic).	The study concluded graphic content combined with family disruptions is more effective for changing attitudes and complying with the warning than other combinations of the manipulated variables.	It was found that the presence of a graphic enhances both cognitive appraisal and fear, and has positive effects on the Depth of Information Processing
(Wood and Wood 2009)	The study examined two United Kingdom online forums designed to support people with gambling problems and people affected by problem gambling (eg, partners, relatives, and friends). The methods utilised were content analysis of 60 forum posts, online semi-structured interviews (n = 19), and an online survey (n = 121).	The forums were most popular with online gamblers, and had a higher ratio of females to males (with gambling problems) than any other comparable service. Significantly more females than males suggested that the forums helped them to cope better with their gambling problem	The study found that the forums helped members to better understand and cope with their own gambling problems or with those of others. A lack of other alternative support, ease of access and availability, need for additional support, insight gained through posting and hearing other's stories, help in resisting urges to gamble, and perceived anonymity were all given as

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
			benefits of the forums.
(Jackson, Francis et al. 2013)	Leisure substitution: The Re(Making) Meaning project provided a structured re-engagement program for 30 participants considered at risk of relapse. In this nine-month, 18-event life-style enhancement project, offered as an adjunct to individual counselling, participants completed a range of gambling and social measures at commencement, 6 months, and 12 months.	Problem gamblers often engage in few social activities other than gambling and post-treatment, can be left with considerable unstructured time and inadequate social skills. As relapse often occurs when the gambler is alone, removing or cutting back on gambling is unlikely to be a successful treatment strategy if recreational and social alternatives are unavailable	Substantial positive change in the Temptation to Gamble Scale, Work and Social Adjustment Scale, Self-Esteem, Anxiety, and Loneliness scales were achieved. However, an RCT would be needed to validate findings
(Lambos and Delfabbro 2007)	Small scale study to test whether pathological gamblers have poorer numerical or statistical knowledge than other people by assessing the numerical reasoning skills, objective gambling knowledge and tendency towards biased reasoning in a sample of 90 regular poker-machine gamblers (pathological and non-pathological) and a non-gambling comparison group (n = 45)	The findings suggest that educating pathological gamblers with greater knowledge about the odds of gambling is unlikely to be an effective harm minimisation strategy.	Analyses based on both group comparisons and regression analyses controlling for differences in educational attainment showed that pathological gamblers scored significantly higher on the cognitive biases measure than other gamblers. However, this difference could not be attributed to poorer knowledge of gambling odds or limited numerical ability among pathological gamblers.
Training of professionals			
(Corney 2011)	Four sessions were delivered in a pilot project conducted in South East England and 140 GPs attended a session of approximately one hour in duration. The aims of the pilot project were to find out whether a GP postgraduate session on problem gambling was a feasible way of raising a GP's awareness of problem	A series of studies have found that GPs are seen to be credible and acceptable people to ask questions about gambling. However, confidence may be a challenge.	Training can be delivered in a form which is acceptable to GPs

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	gambling; encouraging GPs to use a screening measure or probes to measure extent of gambling; and giving information about treatment services.		
(Guttentag, Harrigan et al. 2012)	Nine hundred thirty-four employees from five casinos in Ontario completed a survey and a further 21 participated in interviews.	Employees' gambling behaviours were found to relate to various workplace influences (exposure to gambling; exposure to patrons; exposure to the work environment, and the existence of training, restrictions, and resources) and employment variables (length of employment, previous industry experience, and department).	employees exhibited problem gambling rates over three times greater than those of the general population. These higher rates were explained primarily by employees who increased their gambling after commencing employment and employees who were attracted to their jobs because of prior gambling involvement.
(Hing and Breen 2008)	Australian study, six case studies of staff working in gaming venue. Qualitative analysis	Responsible gambling training and other venue-based responsible gambling measures did not protect these staff from gambling problems.	the attraction of gambling is reportedly enhanced by close interaction with gamblers, frequent exposure to gambling, the influence of fellow employees, the influence of management, workplace stress, hours of work, and frequent exposure to gambling marketing and promotions.
(Shandley and Moore 2008)	Gamblers helpline evaluation. HL callers were recruited to participate in an immediate post-call questionnaire-based telephone interview (N = 90) and one-month follow-up interview (N = 56). The first aim of the study was to present a descriptive profile of those accessing the	Needs to link up effectively with referral service for treatment/advice	Callers reported general overall satisfaction with the service. Consumer feedback highlighted the importance for GHL counselors of providing a balance of both emotional and practical support for callers, and the

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	helpline. The second aim was to examine the effectiveness of the counselling intervention through measures taken post callers' contact to GHL. The final aim was to examine referral uptake at a follow-u		importance for callers to access referrals was identified
Legislative approaches to problem gambling			
(Rossow, Hansen et al. 2013)	Investigation of behaviour change after the introduction of a ban on slot machines in Norway. Two school surveys were conducted, one before (in 2006) and one after the intervention (in 2008), comprising students aged 13 to 18 years (net samples = 4,912 in 2006 and 3,855 in 2008). Identical measures of gambling behaviour and problem gambling were obtained in both surveys	The ban and removal of slot machines in Norway was succeeded by a decrease in frequent gambling among adolescents in general as well as among at-risk and problem gamblers.	After the intervention, a small proportion reported that they had changed their gambling behaviour, mainly in terms of having stopped gambling. Comparisons of self-reports of gambling behaviour showed that slot machine gambling had decreased significantly, while gambling on other games had increased, yet frequent gambling on any game had decreased after the intervention. However, the change in prevalence of at-risk and problem gambling differed across instruments. The prevalence of self-perceived gambling problems had decreased whereas the prevalence of at-risk and problem gambling as assessed by SOGS-RA had increased. Among at-risk and problem gamblers frequent

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			gambling and perceived gambling problems were reported less frequently in 2008 compared to 2006.
(Monaghan, Blaszczynski et al. 2009)	93 undergraduate students were randomly allocated to standard and informative messages displayed on an electronic gaming machine during play in a laboratory setting	Signs placed on electronic gaming machines may not modify irrational beliefs or alter gambling behaviour.	Results revealed that a majority of participants incorrectly estimated gambling odds and reported irrational gambling-related cognitions prior to play. In addition, there were no significant between-group differences, and few participants recalled the content of messages or modified their gambling-related cognitions.
(Delfabbro 2008)	15 per cent reduction in gaming machine numbers in the state of South Australia and the apparent effects on gaming revenue and gambling behaviours. Detailed analysis of objective EGM data as well as survey-based interviews with 400 regular EGM players		n Australia, there is evidence to suggest that there is a positive association between the geographical accessibility of electronic gaming machines (EGMs) and the frequency and intensity of gambling in local areas.
(Bu and Skutle 2013)	Review of demographic characteristics of referrals to problem gambling clinic after the implementation of the ban of slot machines in Norway. The participants were 99 patients, 16 women and 83 men, with the mean age of 35 years. A comprehensive assessment package was applied, focusing on demographical characteristics, the severity of pathological gambling, mental health and substance use disorder.	The demographic characteristics of treatment seeking patients after the ban was significantly different to prior to the intervention.	After the ban the mean age was significantly lower, and significantly more were highly educated, in regular employment, and married. Internet gambling and a sport betting game called Odds were the most common options, and gambling problems had become more severe with greater depth due to gambling, bad conscious, heavy alcohol

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			consumption, and more suicidal thoughts and attempts.
(Ludwig, Kraus et al. 2012)	This study examined changes in general population gambling in the light of two major amendments of the German gambling regulation, the Fifth Amendment of the German Gambling Ordinance (AGO) for commercial amusement machines with prizes (AWP) and the State Treaty on Gambling (STG) for gambling activities subject to the state monopoly. Applying cross-sectional data from the 2006 and 2009 Epidemiological Survey of Substance Abuse (ESA), propensity-score-matched samples of 7,970 subjects and 3,624 12-month gamblers aged 18–64 years were used for analyses. Logistic regression was employed to examine changes in gambling controlling for possible confounding variables.	Prohibiting specific gambling activities, eg, Internet gambling, seem to be insufficient approaches to change gambling behaviour. Supply reduction might need to be enhanced by changes in game characteristics and implementation of early intervention measures. However, long-term consequences are uncertain and further monitoring is needed	Overall participation in state gambling activities, participation in lotto as well as TV lottery decreased and gambling on Internet card games increased. No changes were found for any other gambling activity, 12-month prevalence of any gambling and pathological gambling. While weekly gambling declined, overall multiple gambling increased. Effects were similar in the total sample and among current gamblers
location			
(Clarke, Pulford et al. 2012)	exploratory study obtained data from questionnaires administered to a convenient, non-representative New Zealand sample of 138 problem gamblers (66 male, 70 female) and 73 non-problem gamblers (41 male, 32 female) categorized by scores on the Problem Gambling Severity Index (PGSI). Age groups ranged from 20 to 60+ years.	From multivariate logistic regression analysis, gambling on EGMs in pubs and clubs was a stronger, unique predictor of current problem gambling than EGMs in casinos, after controlling for demographic factors and total gambling activities.	Of 11 gambling activities, only gambling on EGMs in casinos and EGMs in pubs and clubs distinguished problem gamblers from non-problem gamblers. There were some significant interactions between marital status and types of gambling activities on problem gambling status.
(Hing and Breen	Using a qualitative design, researchers	Providing more regular shifts and	themes include: a lack of

Reference	Overview of Methodology	Intervention Point/learning to inform development of future interventions	Significant findings
2008)	visited venues in 5 regions of Queensland to interview 92 employees from hotels, licensed clubs and casinos. Data was analysed thematically.	promoting family and alternative social and recreational activities for staff are measures venues could implement to help counter these effects	alternative social opportunities, only gambling venues are open after late shifts, staff tend to socialise with other hospitality workers, social isolation, gamble to fill in time, and shiftwork makes it easier to hide heavy gambling. However, some interviewees felt shiftwork discouraged them from gambling, because most gambling venues are closed after finishing late shift and shiftwork means they go out less overall. Other employees considered that shiftwork had no influence, because they find other activities in their time off and/or they just go home after a shift.
(Hing and Breen 2007)	managers' opinions were gathered on how working in gaming venues influences employees' gambling. Personal interviews were conducted with 44 club, 27 hotel and two casino managers. Judgment sampling was used to include managers from venues of different sizes, types and locations	Most managers considered that working in a gambling venue mainly discourages employees from gambling.	Using content analysis, eight major workplace factors, comprised of 46 sub-factors, were perceived to encourage employees to gamble. Nine major workplace factors, comprising of 27 sub-factors, emerged that appear to discourage employees from gambling. Nine major workplace factors, comprising of 47 sub-factors, were reported to have no influence on staff gambling.
(Hing and Gainsbury 2013)	Australian gambling industry employees (N = 551) completed a survey measuring	The identification of risk and protective factors in gambling venues may	The study identifies five risk factors relating to problem

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	gambling behaviour, problem gambling, and factors that may influence gambling.	prompt healthier workplace practices and effective prevention and treatment programs.	gambling development – workplace motivators, influence of colleagues, workplace triggers, limited social opportunities, and familiarity and interest in gambling. Two protective factors are identified – exposed to gambling losses and problems and influence of colleagues. In addressing gambling problems, one factor – discouragement to address a gambling problem – distinguishes the problem gambler group. One factor – encouragement to address a gambling problem – provides protection for the staff

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