

APPENDIX 3: BRIEF BIOGRAPHY OF THE REPORT AUTHOR

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Dr. Mark Griffiths is a Chartered Psychologist and Professor of Gambling Studies at the Nottingham Trent University, and Director of the *International Gaming Research Unit*. He is internationally known for his work into gambling and gaming addictions and has won many awards including the American 1994 *John Rosecrance Research Prize* for “outstanding scholarly contributions to the field of gambling research”, the 1998 European CELEJ Prize for best paper on gambling, the 2003 Canadian *International Excellence Award* for “outstanding contributions to the prevention of problem gambling and the practice of responsible gambling” and a North American 2006 *Lifetime Achievement Award For Contributions To The Field Of Youth Gambling* “in recognition of his dedication, leadership, and pioneering contributions to the field of youth gambling”. In 2013, he received the Lifetime Research Award from the US National Council on Problem Gambling.

He has published over 450 refereed research papers, three books, over 120 book chapters, and over 1000 other articles. He has served on numerous national and international committees (e.g. *BPS Council, BPS Social Psychology Section, Society for the Study of Gambling, Gamblers Anonymous General Services Board, National Council on Gambling etc.*) and is a former National Chair of Gamcare. He also does a lot of freelance journalism and has appeared on over 2500 radio and television programmes since 1988.

He has been the keynote speaker at national gambling conferences in the UK, USA, Canada, Australia, Germany, Spain, Sweden, Norway, Denmark, Ireland, Finland, Poland, Italy, Holland and Belgium. He has also given keynote addresses to the US National Academy of Sciences (Washington DC), and the US National Center for Addiction (New York). He has also acted as a consultant for many Government bodies including the *Gambling Board for Great Britain, Gambling Commission, UK Home Office, Department of Culture, Media and Sport, Department of Health, Victorian Casino and Gaming Authority* (Australia) and various international Governments (including the US, Australia, Sweden, Norway and Finland). In 2004 he was awarded the *Joseph Lister Prize for Social Sciences* by the *British Association for the Advancement of Science* for being one of the UK’s “outstanding scientific communicators”. Other recent awards include the 2006 Excellence in the Teaching of Psychology Award by the *British Psychological Society* and the *British Psychological Society Fellowship Award* for “exceptional contributions to psychology”.

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PROBLEM GAMBLING IN GREAT BRITAIN: A BRIEF REVIEW

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EXECUTIVE SUMMARY

- For many people the concept of addiction involves taking drugs. However, there is a growing movement which views a number of behaviours as potentially addictive including behaviours that do not involve the ingestion of a drug (e.g. gambling).
- Among many researchers and clinicians ‘addiction’ has come to refer to a disorder in which an individual becomes intensely preoccupied with a behaviour that at first provides the desired or appetitive effect but where eventually the long-term disadvantages outweigh the short-term benefits.
- An increasing number of research studies over the last three decades suggest that a wide range of chemical and behavioural addictions (including gambling addiction) may serve similar functions.
- Negative consequences of gambling addiction may include interference with performance of life roles (e.g. job, social activities, or hobbies), impairment of social relationships, criminal activity, legal problems, involvement in dangerous situations, physical injury and impairment, financial loss, or emotional trauma.
- In Great Britain, the term ‘problem gambling’ has been used by many researchers, bodies, and organisations, to describe gambling that compromises, disrupts or damages family, employment, personal or recreational pursuits.
- Problem gambling is often co-morbid with other behavioural and psychological disorders, which can exacerbate, or be exacerbated by, problem gambling. Taken as a whole, this suggests that problem gambling does not occur in a vacuum and that problem gambling is symptomatic of a more global disturbance in the biopsychosocial functioning of individuals that have gambling problems.
- ‘Problem gambling’ and ‘gambling addiction’ are not the same and should not be used interchangeably. There is a need to think of these terms as lying along a continuum in which ‘gambling addiction’ is at the extreme end of the scale and that ‘problem gambling’ (while still of major concern) does not necessarily lead to problems in every area of a person’s life.

- Researchers internationally are beginning to reach a consensus over a view of problem gambling that moves away from earlier, often heavily clinical definitions found in the Diagnostic and Statistical Manual of Mental Disorders.
- The most recent British Gambling Prevalence Survey [BGPS] published in 2011 reported that 73% of the British adult population (aged 16 years and over) participated in some form of gambling in the past year (equating to around 35.5 million adults).
- The prevalence of problem gambling in the BGPS using the Problem Gambling Severity Index [PGSI] was 0.7% (up slightly from 0.5% in the 2007 survey). This equates to approximately 360,000 British adults aged 16 years and over. The prevalence of problem gambling using the criteria in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders [DSM-IV] was higher in 2010 (0.9%) than in 2007 (0.6%). This equates to around 451,000 adults aged 16 years and over.
- The most recent data published in 2014 combining findings from the Health Survey for England (HSE) and the Scottish Health Survey (SHeS) reported that two-thirds of the British sample (65%) had gambled in the past year, with men (68%) gambling more than women (62%).
- Problem gambling in the HSE/SHeS study using the PGSI criteria was reported to be 0.4%. This equates to approximately 180,200 British adults aged 16 years and over. Problem gambling assessed using DSM-IV criteria was reported to be 0.5%. This equates to approximately 224,100 British adults aged 16 years and over.
- Given that the same instruments were used to assess problem gambling, the results of the most recent surveys using data combined from the HSE and SHeS compared with the most recent BGPS do seem to suggest that problem gambling has decreased in Great Britain over the last few years (from 0.7% to 0.4% using PGSI; from 0.9% to 0.5% using DSM-IV). However, caution should be noted as the survey vehicles were not the same. The BGPS was a study collecting gambling data only whereas the HSE and SHeS were studies collecting health data in which gambling was one of many areas investigated.
- Problem gambling rates in the HSE/SHeS study were also examined by type of gambling activity. Results showed that among past year gamblers, problem gambling was highest among spread betting (20.9%), played poker in pubs or clubs (13.2%), bet on other events with a bookmaker (12.9%), bet with a betting exchange (10.6%). The activities with the lowest rates of problem gambling were playing the National Lottery (0.9%) and scratchcards (1.7%).
- Problem gambling rates in the HSE/SHeS study were highest among individuals that had participated in seven or more activities in the past year (8.6%) and lowest among those that had participated in a single activity (0.1%).
- Data also appears to suggest that since 2010, the rate of problem gambling in England has significantly dropped but that rates of problem gambling in Scotland have held relatively stable. Rates of pathological gambling appear to be extremely low and in some surveys were not even reported as the base sizes were too small.
- Problem gambling prevalence rates observed in Great Britain are similar to rates observed in other European countries, notably Germany, Norway and Switzerland, and lower than countries like the USA, Australia and South Africa.
- Reviews of literature reveal that the number of correlates or potential risk factors of problem gambling are numerous, and it is possible that different combinations of a number of factors may explain the development of problem gambling for different individuals. □ Problem gambling often co-occurs with other potentially addictive behaviours. For instance, survey population research at a national level has consistently found an association between levels of self-reported gambling-related problems and at-risk levels of alcohol consumption.

PROBLEM GAMBLING IN GREAT BRITAIN: A BRIEF REVIEW

Gambling and problem gambling: Conceptual and definitional issues

Gambling is a diverse concept that incorporates a range of activities undertaken in a variety of settings. It includes differing sets of behaviours and perceptions among participants and observers. Predominantly, gambling has an economic meaning and usually refers to risking (or wagering) money or something of value on the outcome of a game, contest, or other event in the hope of winning additional money or material goods. The activity varies on several dimensions, including what is being wagered, how much is being wagered, the expected outcome, and the predictability of the event. For some things such as lotteries, most slot machines and bingo, the results are random and unpredictable. For other things, such as sports betting and horse racing, there is some predictability to the outcome and the use of skills and knowledge (e.g., recent form, environmental factors) can give a person an advantage over other gamblers.

Gambling is commonly undertaken in a variety of environments including those dedicated primarily to gambling (e.g. betting shops, casinos, bingo halls, amusement arcades), those where gambling is peripheral to other activities (e.g. social clubs, pubs, sports venues), and those environments where gambling is just one of many things that can be done (e.g. supermarkets, post offices or petrol stations). In addition, most types of gambling can now be engaged in remotely via the internet, interactive television and/or mobile phone.

In Great Britain, the term 'problem gambling' has been used by many researchers, bodies, and organisations, to describe gambling that compromises, disrupts or damages family, employment, personal or recreational pursuits (Griffiths, 2004). There is some disagreement in the literature as to the terminology used, as well as the most appropriate screens to diagnose and measure the phenomenon. Researchers internationally are beginning to reach a consensus over a view of problem gambling that moves away from earlier, often heavily DSM-based clinical definitions. For instance, early conceptions of 'pathological gambling' were of a discrete 'disease entity' comprising a chronic, progressive mental illness, which only complete abstinence could hope to manage.

More recent thinking regards problem gambling as behaviour that exists on a continuum, with extreme, pathological presentation at one end, very minor problems at the other, and a range of more or less disruptive behaviours in between. Moreover, this behaviour is something that is mutable. Research suggests it can change over time as individuals move in and out of problematic status and is often subject to natural remission (Meyer, Hayer & Griffiths, 2009). Put more simply, gamblers can often move back to non-problematic recreational playing after spells of even quite serious problems. This

conception fits in with an emphasis on more general public health, with a focus on the social, personal and physical 'harms' that gambling problems can create among various sectors of the population, rather than a more narrow focus on the psychological and/or psychiatric problems of a minority of 'pathological' individuals. Such a focus tends also to widen the net to encompass a range of problematic behaviours that can affect much larger sections of the population.

There are a multitude of terms used to refer to individuals who experience difficulties related to their gambling. These reflect the differing aims and emphases among various stakeholders concerned with treating patients, studying the phenomenon, and influencing public policy in relation to gambling legislation. Besides 'problem' gambling, terms include (but are not limited to) 'pathological', 'addictive', 'excessive', 'dependent', 'compulsive', 'impulsive', 'disordered', and 'at-risk' (Griffiths, 2007). Terms are also employed to reflect more precisely the differing severities of addiction. For example, 'moderate' can refer to a lesser level of problem, and 'serious problem gambling' to the more severe end of the spectrum.

Although there is no absolute agreement, commonly 'problem gambling' is used as a general term to indicate all of the patterns of disruptive or damaging gambling behaviour. This report follows this precedent, employing the use of the term 'problem gambling' to refer to the broad spectrum of gambling-related problems. Problem gambling must be distinguished from social gambling and professional gambling. Social gambling typically occurs with friends or colleagues and lasts for a limited period of time, with predetermined acceptable losses. There are also those who gamble alone in a non-problematic way without any social component. In professional gambling, risks are limited and discipline is central. Some individuals can experience problems associated with their gambling, such as loss of control and short-term chasing behaviour (whereby the individual attempts to recoup their losses) that do not meet the full criteria for pathological gambling.

It should also be noted that problem gambling does not occur in a vacuum and that problem gambling is often co-morbid with other behavioural and psychological disorders, which can exacerbate, or be exacerbated by, problem gambling. Some of the psychological difficulties a problem gambler may experience include anxiety, depression, guilt, suicidal ideation and actual suicide attempts (Griffiths, 2004). Problem gamblers may also suffer irrational distortions in their thinking (e.g. denial, superstitions, overconfidence, or a sense of power or control) (Griffiths, 1994a). Increased rates of attention-deficit hyperactivity disorder (ADHD), substance abuse or dependence, antisocial, narcissistic, and borderline personality disorders have also been reported in pathological gamblers (Sussman, Lisha & Griffiths, 2011). There is frequently a link with alcohol or drugs as a way of coping with anxiety or depression caused by gambling problems, and, conversely, alcohol may trigger the desire to gamble (Griffiths, Parke & Wood, 2002). There is also some evidence that co-morbidities may differ among demographic subgroups and gambling types. Taken as a whole, this suggests that problem gambling does not occur in a vacuum and that problem gambling is symptomatic of a more global disturbance in biopsychosocial functioning of individuals that have gambling problems.

Distinctions between problem gambling and gambling addiction

It has been pointed out that very few people are genuinely addicted to playing weekly or bi-weekly Lotto games (Griffiths & Wood, 2001). Some people may counter such an assertion by pointing out they know people who spend far too much money on buying Lotto tickets and that it is a real problem in their life. Buying too many Lotto tickets can be problematic if the person buying them simply cannot afford it. However, the resulting behaviour is 'problem gambling' not 'gambling addiction'. These two terms are not inter-changeable. Although all gambling addicts are problem gamblers not all problem gamblers are gambling addicts (Griffiths, 2014).

Almost all national British surveys that have assessed problem gambling behaviour have used two different problem gambling screens (i.e. the DSM-IV [Fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders*] and the PGSI [*Problem Gambling Severity Index*]). Neither of these screens assesses 'gambling addiction' and problem gambling is operationally defined according to the number of criteria endorsed on each screen. For instance, on the DSM-IV, any individual that endorses three or more items (out of ten) is classed as a problem gambler. Anyone that endorses five or more items is classed as a pathological gambler. Pathological gambling is more akin to gambling addiction but only a tiny percentage of national participants are classed as such.

Although many people may still use the terms 'problem gambling' and 'gambling addiction' interchangeably, there is a need to think of these terms as lying along a continuum in which 'gambling addiction' is at the extreme end of the scale and that 'problem gambling' (while still of major concern) does not necessarily lead to problems in every area of a person's life. Many problem gamblers (as operationally defined by endorsing a number of specific items on a screen) do not display all the 'classic' indicators of genuine addictions (e.g. withdrawal symptoms, tolerance, relapse, salience, conflict, or mood modification; Griffiths, 2005). The concept of what it is to be 'addicted' to a substance or activity is briefly explored in the following section.

Excessive behaviour and addiction

Traditionally, the concept of addiction has involved taking drugs (i.e. the ingestion of a psychoactive substance). However, there is now a growing movement that views a number of behaviours as potentially addictive including many behaviours that do not involve the ingestion of a drug. These include behaviours as diverse as gambling, overeating, sex, exercise, videogame playing, love, Internet use, and work (Griffiths, 2005). Such diversity has led to new all-encompassing definitions of what constitutes addictive behaviour. One such definition is that of Marlatt, Baer, Donovan, and Kivlahan (1988), who define addictive behaviour as:

"...a repetitive habit pattern that increases the risk of disease and/or associated personal and social problems. Addictive behaviours are often experienced subjectively as 'loss of control' – the behaviour contrives to occur despite volitional attempts to abstain or moderate use. These habit patterns are typically characterized by immediate gratification (short term reward), often coupled with delayed deleterious effects (long term costs). Attempts to change an addictive behaviour (via treatment or self initiation) are typically marked with high relapse rates" (p.244).

An increasing number of research studies over the last three decades suggest that a wide range of chemical (i.e. substance) and behavioural (i.e. process) addictions may serve similar functions. While often previously associated with physiological tolerance and withdrawal effects, the term 'addiction' has achieved a broader definition (Brewer & Potenza, 2008; Marks, 1990; Griffiths, 2005; Orford, 2001; Schneider & Irons, 2001). Among many researchers and clinicians, 'addiction' has come to refer to a disorder in which an individual becomes intensely preoccupied with a behaviour that at first provides the desired or appetitive effect but eventually the long-term disadvantages outweigh the short-term benefits.

Addiction is often associated with subjective reports of arousal, pleasure, or fantasy (e.g. Brewer & Potenza, 2008; Johansson, Grant, Kim, et al., 2009; Schneider & Irons, 2001; Volkow & Wise, 2005). Furthermore, the addictive behaviour occurs with several pattern variations (e.g. bingeing, or sustained preoccupation), but always repeatedly, involving a great deal of time thinking about and engaging in the behaviour (Brewer & Potenza, 2008; Marks, 1990).

An addiction disorder also typically involves loss of ability to choose freely whether to stop or continue the behaviour (loss of control), and leads to experience of behaviour-related adverse consequences (Schneider & Irons, 2001). In other words, the person becomes unable to reliably predict when the behaviour will occur, how long it will go on, when it will stop, or what other behaviours may become associated with the addictive behaviour. As a consequence, other activities are given up or, if continued, are no longer experienced as being as enjoyable as they once were. Further negative consequences of the addictive behaviour may include interference with performance of life roles (e.g. job, social activities, or hobbies), impairment of social relationships, criminal activity, legal problems, involvement in dangerous situations, physical injury and impairment, financial loss, or emotional trauma (Sussman, et al., 2011).

While many drug and non-drug addictions do not appear to produce obvious physical dependence (i.e. physiological-based tolerance and withdrawal effects), they do create a subjective need for increased involvement in the behaviour to achieve satiation, and abrupt termination of the behaviour often leads to such symptoms as depression, intense anxiety, hopelessness, helplessness and irritability (e.g. Allegre et al., 2006). The addictive behaviour may seem to the addict 'as if' it is the best solution to resolve these negative symptoms (Sussman & Unger, 2004). Regardless of level of physical dependence, relapse rates across various addictions appear to be relatively high (Sussman, et al, 2011).

In May 2013, the new DSM criteria for problem gambling (i.e. 'Gambling Disorder' – see Appendix 1) were published in the fifth edition of the *Diagnostic and Statistical Manual for Mental Disorders* (DSM-5), and for the very first time (American Psychiatric Association (2013), problem gambling was included in the section 'Substance-related and Addiction Disorders' (rather than in the section on impulse control disorders).

Gambling and problem gambling in Great Britain

Research into gambling practices, the prevalence of gambling and problem gambling, and the socio-demographic variables associated with gambling and problem gambling has not been considered part of mainstream health research agendas until quite recently. Table 1 shows the adult gambling participation in Great Britain using data collected by the Gambling Commission. The data are collected quarterly by ICM Research and the sample sizes each quarter are approximately 4,000 adults.

Table 1: Adult gambling participation in last four weeks by activity in Great Britain

Gambling type	2010	2011	2012	2013	2014
National Lottery Draws	45.5	47.5	46	43	41
Scratchcards	10.2	12.7	11	10	10
Another lottery	12.2	9.6	12	13	13
Fruit/slot machines	2.8	3.5	2	2	2
Virtual gaming machines in bookmaker	1.8	1.8	1	1	2
Bingo	2.9	3.1	3	3	3
Football pools	2.8	2.8	3	3	3
Horse race betting	3.7	4.5	4	4	7
Dog race betting	0.7	1	0.5	1	1
Sports betting	2.2	2.6	3	4	4
Virtual dog/horse races	0.7	1	0.2	0.5	0.2
Spread betting	0.5	0.5	0.3	0.3	0.2
Online slots/instant win games	1.4	1.6	0.3	0.6	0.7
Casino games	1	1.3	1	1	1
Poker at pub/club	1.1	0.7	0.4	0.5	0.6
Private betting	3	2.8	3	3	3
Any other activity	0.8	1.8	1	1	1
Any online betting	2.3	2.2	4	3	4
Any online gambling activity	11.1	12.4	14	15	14
Any gambling activity	55.5	57.3	57	55	56

Source: Gambling Commission (Quarterly reports from 2011-2014)

These data collected over a five-year period refer to gambling participation by activity over the past four weeks. Table 1 shows that gambling participation has been relatively stable over the last five years with around 55%-57% adults gambling in the previous four-week period. Over the time period gambling online has slowly increased and some gambling activities have slightly decreased their popularity over time (e.g. National Lottery).

Most gambling participation appears to have been relatively stable. In 2014, there was an increase of gambling on 'virtual gaming machines in bookmakers' from 1% to 2% but no distinction was made in the surveys between B2 machine games (i.e. fixed odds betting terminals that have a maximum £100 stake with a maximum £500 prize) and B3 machine games (slot machines that have a maximum £2 stake with a maximum £500 prize). Therefore, it cannot be determined if B2 machine use or B3 machine use is driving this rise, or if both are rising.

2010 British Gambling Prevalence Survey

As noted above, 'problem gambling' is gambling to a degree that compromises, disrupts or damages family, personal or recreational pursuits (Griffiths, 2004). To date, there have only been three national adult British Gambling Prevalence Survey [BGPS] studies (i.e. Sproston et al. 2000; Wardle et al. 2007; 2011). The extent of gambling activity, as measured in these surveys, revealed gambling to be a popular activity in Britain. In the most recent survey comprising 7,756 participants aged 16 years and above (Wardle, et al, 2011) it was reported that:

- Approximately three-quarters (73%) of the British adult population (aged 16 years and over) participated in some form of gambling in the past year (equating to around 35.5 million adults).
- The most popular British gambling activity was playing the National Lottery (59%), a slight increase in participation from 2007 (57%). There was an increase in the participation rate for betting on events other than horse races or dog races with a bookmaker (6% in 2007, 9% in 2010), buying scratchcards (20% in 2007, 24% in 2010), gambling online on poker, bingo, casino and slot machine style games (3% in 2007, 5% in 2010) and gambling on fixed odds betting terminals (3% in 2007, 4% in 2010), football pools (3% in 2007, 4% in 2010). There were some small but significant decreases in the popularity of slot machines (13% in 2010, 14% in 2007) and online betting (4% in 2007, 3% in 2010). For all other gambling activities, there was either no significant change between survey years or estimates varied with no clear pattern
- Overall, 14% of adults had gambled online on some activity in the past year (e.g. buying lottery tickets, betting online, and playing casino games, bingo).

- Men were more likely to gamble than women overall (75% men; 71% women). Among women, past year gambling increased from 65% in 2007 to 71% in 2010. Among men, past year gambling estimates were higher in 2010 than 2007 (75% and 71% respectively).
- Problem gambling prevalence rates were assessed using two different screens (the PGSI and the DSM-IV). The prevalence of problem gambling using the PGSI was 0.7% (up slightly from 0.5% in the 2007 survey). This equates to approximately 360,000 British adults aged 16 years and over. The prevalence of problem gambling using the DSM-IV criteria was higher in 2010 (0.9%) than in 2007 (0.6%). This equates to around 451,000 adults aged 16 years and over. There is increasing evidence from the BGPS series that the DSM-IV and the PGSI screens are capturing slightly different people and different types of gambling-related problems.
- Among past year gamblers, problem gambling prevalence rates were highest among those who had played poker at a pub/club (12.8%), online slot machine games (9.1%) and fixed odds betting terminals (8.8% - down from 11.2% in the 2007 BGPS). The lowest problem gambling rates were among those that played the National Lottery or scratchcards (both 1.3%). However, problem gamblers also gamble on many different activities and problem gambling prevalence was highest among those that gambled on nine or more different activities on a regular basis (28%).
- The study also reported that problem gamblers were more likely to be male, younger, a current cigarette smoker, have parents who gambled regularly and who have previously experienced problems with their gambling behaviour.
- Problem gambling prevalence rates observed in Great Britain were similar to rates observed in other European countries, notably Germany, Norway and Switzerland, and significantly lower than countries like the USA, Australia and South Africa.

It should perhaps also be noted that the BGPS (and other British-based surveys highlighted below) often include those aged 16 and 17 years in their surveys of 'adults'. Almost all researchers in the gambling studies field would class those under the age of 18 years as adolescents. Given that studies from every country worldwide have consistently shown that problem gambling prevalence rates among adolescents are significantly higher than among adults (Griffiths, 2011), this may have slightly inflated the rates of 'adult' problem gambling in the British surveys (i.e. exclusion of the data from those aged 16 or 17 years may have led to slightly lower rates of problem gambling being recorded). It is also worth noting that researchers internationally are beginning to reach a consensus over a view of problem gambling that moves away from earlier, often heavily DSM-based clinical definitions.

2009 Adult Psychiatric Morbidity Study

Another robust set of data on gambling and problem gambling comes from the Adult Psychiatric Morbidity Survey (APMS) carried out by the National Centre for Social Research and University of Leicester (2009). However, the survey only collected data from English (rather than British) participants and like the BGPS 2010 is now relatively old. The study examined many types of psychiatric morbidity in a nationally representative sample of English adults aged 16 years and over (n=7,403 adults) via face-to-face interviews and self-completion surveys (although again, it is worth noting that those aged 16 and 17 years would not be viewed as ‘adults’ by most in the gambling studies field). Although there were acknowledged limitations to the data collected (e.g. household population surveys are likely to under-sample dependent adults as such individuals are more likely to be homeless, may be less available to interview and/or unwilling to participate in such surveys), they were no different to the BGPS. Problem gambling was measured using the DSM-IV criteria as in the BGPS surveys.

- The results showed that approximately two-thirds of adults aged years and over (65.9%) spent money on a gambling activity in the year prior to the survey. Males were more likely than females to gamble, with the highest rate for males being in the 25-34 year old age group (75.4%), whereas among females it was highest among those in the 55-64 year old age group (69.5%).
- The survey also reported that 3.2% of the participants met one or more of the criteria for problem gambling (and were labelled ‘at risk’ of problem gambling).
- In relation to problem gambling, 0.7% of people met three or more of the DSM-IV criteria, and 0.3% of people met the threshold of five or more criteria (i.e., indicative of what was termed pathological gambling in the DSM-IV but would now be termed ‘gambling disorder’).
- Men were more likely than women to meet both the thresholds for problem gambling and pathological gambling. The prevalence rates (from data collected in 2007) were in line with results from the British 2007 British Gambling Prevalence Survey (Wardle, et al, 2007) but were slightly lower than the most recent BGPS (Wardle, et al, 2011).

The APMS chapter on gambling concluded that:

“The APMS data show that, while some factors are strongly associated with gambling and with problem gambling, the picture is complex, and different for men and women. For example, living in households with the highest income was associated with the highest rates of gambling participation in men, but the lowest rates in women. However affordability seems to affect participation in the lowest income households, with rates being relatively low in this group for both men and women. BGPS data show that the gambling activities of women are different from those of men, and a recent study of women’s National Lottery play highlighted how their practice and expenditure regulation was modified by the demands of family budgeting. The prevalence of problem gambling in women is about a third that of men, compounding the problems of sample size. While the APMS data cannot clearly profile women problem gamblers, it is adequate to suggest that the patterns of association are different from those in men” (p.205).

2012 Health Survey For England

More recently, gambling questions and problem gambling screens have been used in both the Health Survey for England (HSE) and the Scottish Health Survey (SHeS). In the HSE chapter on gambling, Wardle and Seabury (2013) reported that approximately two-thirds of adults (n=8,291) participating in the survey (aged 16 years and over) had gambled in the past year. More specifically, 68% of males and 61% of females had gambled in the past year.

- As with the BGPS studies, the forms of gambling that were most participated in were the National Lottery (56% males; 49% females), and scratchcards (19% males; 20% females). Other gambling participation rates included other lotteries (14% for both males and females), betting on horse racing (12% males; 8% females), slot machines (10% males and 5% females), private betting (9% males), online betting with a bookmaker (8% males; 2% females), betting on sports events (8% males; 1% females) and bingo (3% males; 7% females).
- It was also reported that there was no overall variation in gambling participation rates in relation to area deprivation (using the Index of Multiple Deprivation).

- The prevalence of problem gambling using the PGSI was 0.6% males and 0.1% females (compared to 1.3% males and 0.2% females in the 2010 BGPS). The prevalence of problem gambling using the DSM-IV criteria was 0.8% in males and 0.2% in females (compared to 1.2% males and 0.3% females in the 2010 BGPS).
- Results also showed that problem gambling prevalence rates were higher among young men, and that rates decreased as men got older (e.g. problem gambling was estimated to be 2.2% among males aged 16-24 years using DSM-IV criteria but only 0.3% among males aged over 75 years). There were no patterns observed for females (but this was mainly because of the very low number of problem female gamblers in the total sample).
- The rates of pathological gambling were not reported as there were too few people that scored five or more on the ten DSM-IV criteria.

The problem gambling rates reported by the national HSE study are significantly lower than those in the most recent BGPS study. However, Wardle and Seabury (2013) commented that it was unclear as to whether there had been a genuine reduction in problem gambling and speculated that the way the data was collected may have had an impact. More specifically she noted:

“It is widely acknowledged that different survey vehicles can generate different estimates using the same measures, because they can appeal to different types of people, with varying patterns of behaviour. An experiment conducted in Canada showed that gambling screens included within health surveys typically generate lower rates of problem gambling than gambling specific studies (Williams & Volberg, 2009). The authors of this report argued this is because non-gamblers are more likely to take part in studies presented as health surveys whereas gamblers are more likely to take part in gambling studies, thus affecting resultant gambling prevalence rates”.

While this might be a plausible explanation for the significant reduction in problem gambling rates, it may also be the case that there has indeed been a significant reduction of problem gambling in England. It may also be the case that the 2010 problem gambling estimates are a short-term fluctuation and that over time the rates will return to those observed previously (or even decrease) because of adaptation effects within the population (see: LaPlante & Shaffer, 2007; Shaffer, LaBrie & LaPlante, 204; Storer & Abbott, 2009).

More specifically, when applied to gambling, adaptation theory postulates that while initial increases in exposure to gambling venues lead to increases in rates of problem gambling (because of such factors as novelty, lack of intervention and prevention programs, etc.), populations eventually adapt and increased negative consequences are not forthcoming despite increased gambling exposure. The results obtained in national British prevalence surveys appear consistent with this theory.

2012 Scottish Health Survey

In the chapter on gambling in the Scottish Health Survey (SHeS), Wardle (2013) reported that approximately 70% of Scottish adults (n=4,185) aged 16 years and over had gambled in the past year (74% males and 67% females). The types of gambling participated in were very similar to both the BGPS studies and the HSE.

- Again, the highest participation rates for gambling over the past year were the National Lottery (58%), scratchcards (18%), other lotteries (15%), and offline horserace betting (10%). Gambling participation was highest among those aged 16-24 (64% males; 47% of women) after playing the National Lottery had been excluded.
- The prevalence of problem gambling using the PGSI was 0.7% (the same as that found in the 2010 BGPS). The prevalence of problem gambling using the DSM-IV criteria was also 0.7% (compared to 0.9% in the 2010 BGPS). Using the PGSI criteria the rates were 1.4% for males and 0.2% for females. Using the DSM-IV criteria, the rates were 1.4% for males and 0.1% for females.
- It was also reported that males, those with poor health, those living in the most deprived areas, and those with a possible alcohol dependence were more likely to be problem gamblers.
- Wardle (2013) claimed that the problem gambling prevalence rates in the SHeS were “similar” to the Scottish data extracted from the 2010 BGPS (0.9% on PGSI in BGPS compared to 0.7% in SHeS; 1.1% on DSM-IV in BGPS compared to 0.7% in SHeS). While there is indeed some similarity in problem gambling rate estimates (particularly on the PGSI), both current rates of problem gambling are lower, and in the case of scores of DSM-IV may in fact be significantly lower.

Using the SHeS data, a latent class analysis was carried out that identified seven different types of gambler. The groups comprised:

- Non-gamblers (31%)
- National Lottery only gamblers (25%)
- [Type 1] Minimal interest gamblers (16% who gambled on lotteries and one other gambling activity)
- [Type 2], Minimal interest gamblers (9% who gambled on other gambling activity but not lottery)
- [Type 1] Moderate interest gamblers (12% who gambled on lotteries and more than one other gambling activity)
- [Type 2] Moderate interest gamblers (6% who were mainly bettors and machine players)
- Multiple interest gamblers (1% who gambled on eight or more activities)

Using this typology, Wardle (2013) reported that 5.5% of moderate interest gamblers (bettors/machine players) and 13.3% of multiple interest gamblers (gambled on eight or more activities) were problem gamblers (according to either the DSM-IV or the PGSI). Wardle (2013) asserted that:

“This is unsurprising given that these groups tended to be male, to be younger and engaged in a greater range of gambling activities, all of which have been repeatedly shown to be associated with problem gambling (either in this chapter or within the BGPS series). The associations between problem gambling and minimal, moderate or multiple interest gamblers were not necessarily linear. Problem gambling rates among moderate interest (lotteries and other activities) gamblers were lowest at 0.4% whereas 1.0% of minimal interest gamblers (other activities) and 0.6% of minimal interest gamblers (lottery and other activity) were problem gamblers. This highlights that whilst the range and number of activities undertaken does have a clear association with problem gambling, there are also some people who experience problems while having a clear gambling activity preference and partaking in a lesser range of activities”.

2014 Combined Health Survey for England/Scottish Health Survey

More recently, Seabury and Wardle (2014; Wardle, Seabury, Ahmed, et al., 2014) published an overview of gambling behaviour in England and Scotland by combining the data from the Health Survey for England (Wardle, 2012; n=8,291 aged 16 years and over) and Scottish Health Survey (Wardle & Seabury, 2012; n=4,815). To be included in the final data analysis, participants had to have completed at least one of the gambling participation questions. This resulted in a total sample of 11,774 participants. It was reported that:

- Two-thirds of the sample (65%) had gambled in the past year, with men (68%) gambling more than women (62%). As with the BGPS, past year participation was greatly influenced by the playing of the bi-weekly National Lottery (lotto) game. Removal of those individuals that only played the National Lottery meant that 43% had gambled during the past year (46% males and 40% females).
- Gambling was more likely to be carried out by younger people (50% among those aged 16-24 years and 52% among those aged 25-34 years).
- The findings were similar to the previous BGPS reports and showed that the most popular forms of gambling were playing the National Lottery (52%; 56% males and 49% females), scratchcards (19%; 19% males and 20% females), other lottery games (14%; 14% both males and females), horse race betting (10%; 12% males and 8% females), machines in a bookmaker (3%; 5% males and 1% females), slot machines (7%; 10% males and 4% females), online betting with a bookmaker (5%; 8% males and 2% females), offline sports betting (5%; 8% males and 1% females), private betting (5%; 8% males and 2% females), casino table games (3%; 5% males and 1% females), offline dog race betting (3%; 4% males and 2% females), online casino, slots and/or bingo (3%; 4% males and 2% females), betting exchanges (1%; males 2% and females 0%), poker in pubs and clubs (1%; 2% males and 0% females), spread betting (1%; 1% males and 0% females).
- The only form of gambling (excluding lottery games) where females were more likely to gamble was playing bingo (5%; 7% females and 3% males).
- Most participants gambled on one or two different activities a year (1.7 mean average across the total sample).
- Problem gambling assessed using the PGSI criteria was reported to be 0.4%, with males (0.7%) being significantly more likely to be problem gamblers than females (0.1%). This equates to approximately 180,200 British adults aged 16 years and over.
- Problem gambling assessed using DSM-IV criteria was reported to be 0.5%, with males (0.8%) being significantly more likely to be problem gamblers than females (0.1%). This

- Using the PGSI screen, problem gambling rates were highest among young men aged 16-24 years (1.7%) and lowest among men aged 65-74 years (0.4%). Using the DSM-IV screen, problem gambling rates were highest among young men aged 16-24 years (2.1%) and lowest among men aged over 74 years (0.4%).
- Problem gambling rates were also examined by type of gambling activity. Results showed that among past year gamblers, problem gambling was highest among spread betting (20.9%), played poker in pubs or clubs (13.2%), bet on other events with a bookmaker (12.9%), bet with a betting exchange (10.6%) and played machines in bookmakers (7.2%).
- The activities with the lowest rates of problem gambling were playing the National Lottery (0.9%) and scratchcards (1.7%).
- Problem gambling rates were highest among individuals that had participated in seven or more activities in the past year (8.6%) and lowest among those that had participated in a single activity (0.1%).

As with the SHeS study, a latent class analysis was carried out and also identified seven different types of gambler among both males and females. The male groups comprised:

- Cluster A: non-gamblers (33%)
- Cluster B: National Lottery only gamblers (22%)
- Cluster C: National Lottery and scratchcard gamblers only (20%)
- Cluster D: Minimal, no National Lottery [gambling on 1-2 activities] (9%)
- Cluster E: Moderate [gambling on 3-6 activities] (12%)
- Cluster F: Multiple [gambling on 6-10 activities] (3%)
- Cluster G: Multiple, high [gambling on at least 11 activities] (1%)

The female groups comprised:

- Cluster A: non-gamblers (40%)
- Cluster B: National Lottery only gamblers (21%)
- Cluster C: National Lottery and scratchcard gamblers only (7%)
- Cluster D: Minimal, no National Lottery (8%)
- Cluster E: Moderate, less varied [2-3 gambling activities, mainly lottery-related] (8%)
- Cluster F: Moderate, more varied [2-3 gambling activities but wider range of activities] (6%)
- Cluster G: Multiple [gambling on at least four activities] (6%)

Using these groupings, the prevalence of male problem gambling was highest among those in Cluster G: multiple high group (25.0%); followed by Cluster F: multiple group (3.3%); and Cluster E: moderate group (2.6%). The prevalence of problem gambling was lowest among those in Cluster B; National Lottery Draw only group (0.1%) followed by Cluster C: minimal – lotteries and scratchcards group (0.7%).

The prevalence of female problem gambling was highest among those in the Cluster G: multiple group (1.8%) followed by those in Cluster F: moderate – more varied group (0.6%). The number of female gamblers was too low to carry out any further analysis.

The report also examined problem gambling (either DSM-IV or PGSI) by gambling activity type.

- The prevalence of problem gambling was highest among spread-bettors (20.9%), poker players in pubs or clubs (13.2%), bettors on events other than sports or horse/dog races (12.9%), betting exchange users (10.6%) and those that played machines in bookmakers (7.2%).
- The lowest problem gambling prevalence rates were among those that played the National Lottery (0.9%) and scratchcards (1.7%).
- These figures are very similar to those found in the 2010 BGPS study although problem gambling among those that played machines in bookmakers was lower (7.2%) than in the 2010 BGPS study (8.8%).
- As with the BGPS 2010 study, the prevalence of problem gambling was highest among those who had participated in seven or more activities in the past year (8.6%) and lowest among those who had taken part in just one activity (0.1%). Furthermore, problem gamblers participated in an average 6.6 activities in the past year.

Given that the same instruments were used to assess problem gambling, the results of the most recent surveys using data combined from the Health Survey for England (HSE) and Scottish Health Survey (SHeS) compared with the most recent British Gambling Prevalence Survey (BGPS) do seem to suggest that problem gambling in Great Britain has decreased over the last few years (from 0.9% to 0.5%). However, Seabury and Wardle again urged caution and noted:

“Comparisons of the combined HSE/SHeS data with the BGPS estimates should be made with caution. While the methods and questions used in each survey were the same, the survey vehicle was not. HSE and SHeS are general population health surveys, whereas the BGPS series was specifically designed to understand gambling behaviour and attitudes to gambling in greater detail. It is widely acknowledged that different survey vehicles can generate different estimates using the same measures because they can appeal to different types of people, with varying patterns of behaviour...Overall, problem gambling rates in Britain appear to be relatively stable, though we caution readers against viewing the combined health survey results as a continuation of the BGPS time series” (p.11).

There are other important caveats to take into account including the differences between the two screen tools used in the BGPS, HSE and SHeS studies. Although highly correlated, evidence from all the British surveys suggests that the PGSI and DSM-IV screens capture slightly different groups of problem gamblers. A study by Orford, Wardle, Griffiths, et al (2010) using data from the 2007 BGPS showed that the PGSI may under-estimate certain forms of gambling-related harm (particularly by women) that are more likely to be picked up by some of the DSM-IV items. The analysis by Orford et al (2010) also suggested that the DSM-IV appears to measure two different factors (i.e. gambling-related harm and gambling dependence) rather than a single one. Another important distinction is that the two screens were developed for very different purposes (even though they are attempting to assess the same construct). The PGSI was specifically developed for use in population surveys whereas the DSM-IV was developed with clinical populations in mind. Given these differences, it is therefore unsurprising that national surveys that utilize the screens end up with slightly different results comprising slightly different groups of people.

It also needs stressing (as noted by the authors of most of the national gambling surveys in Great Britain) that the absolute number of problem gamblers identified in any of the surveys published to date has equated to approximately 60 people. To detect any significant differences statistically between any of the studies carried out to date requires very large sample sizes. Given the very low numbers of problem gamblers and the tiny number of pathological gamblers, it is hard to assess with complete accuracy whether there have been any significant changes in problem and pathological gambling between all the published studies over time. Wardle et al (2014) concluded that: “Overall, based on this evidence, it appears that problem gambling rates in England and Scotland are broadly stable. Whilst problem gambling rates according to either the DSM-IV or the PGSI were higher in 2010, the estimate between 2007 and the health surveys data were similar. Likewise, problem gambling rates according to the DSM-IV and the PGSI individually did not vary statistically between surveys, meaning that they were relatively similar” (p.130).

Problem gambling and fixed odds betting terminals in Great Britain

The last decade has seen many changes in the British gambling landscape. The most notable of these include (i) the growth in the availability of remote gambling (via the internet, mobile phone, and interactive television), (ii) the introduction of online betting exchanges, (iii) an increase in the prominence of poker (both online and offline), (iv) an increase in the number of casinos, and (v) the introduction of fixed odds betting terminals (FOBTs) into most bookmakers.

Relatively little is known about FOBT play among the British population, and the best quality data arguably comes from the British Gambling Prevalence Survey (BGPS). As noted above, only 4% had ever played on FOBTs (up from 3% in the previous 2007 survey) with 6% having played FOBTs in the year prior to the survey. Playing FOBTs was more of a male activity with 7% of males compared to 2% females having ever played (with 10% males and 2% females having played FOBTs in the previous year).

The highest participation rates were among individuals aged in the 16-24 year old age group (12%), followed by 25-34 year olds (9%) and 35-44 year olds (3%). Our study also showed that the prevalence of playing FOBTs was highest among those with the lowest personal income (7%) and lowest among those with highest personal income (4%). This was most likely related to the finding that FOBTs were significantly more likely to be played by people who were out of work. More specifically, 12% of those who were unemployed had played FOBTs in the past year compared with 4% of participants overall. Past year gambling was related to marital status, although as pointed out in the report, this was likely to be a reflection of the relationship between age and marital status. Prevalence of playing on FOBTs was three times higher among those who were single (9%) than those who were married or separated/divorced (3%).

Further analysis on the 2010 BGPS dataset by Wardle, Sutton, Philo, Hussey, and Nass (2013) reported that FOBT players (that mainly just gambled on machines in bookmakers) accounted for approximately 14% of all machine gamblers. Such players were primarily male and, compared with other machine players, were more likely to be from non-white ethnic groups and to have started gambling after the age of 16 years. It was also reported that FOBT players had high levels of involvement with gambling generally and machine gambling specifically, as well as more positive attitudes towards gambling. The report also noted that:

“They were strongly engaged in other forms of gambling and with machine gambling itself, having the highest frequency of machine play of all groups (18% played on two or more days per week) and having higher proportions in the high time/high spend group. Many of these are typically viewed as risk-factors for the experience of gambling-related harm and certainly high levels of gambling involvement suggest that attention be given to this sub-group of machine player. That said, 46% of this group also played on machines less than once month, further highlighting how different patterns of play are evident within these groups. This reminds us that even within machine player types, there is a heterogeneity of play patterns – some are very engaged in machine gambling, others less so” (pp.67-68).

In the BGPS report (Wardle, et al 2011), the prevalence rate of ever having gambled on FOBTs was very low – compared to lottery gambling (59%) and playing scratchcards (24%) – the majority that did play on FOBTs did so every week (52%). Also noted above, the prevalence of problem gambling of those that had played FOBTs was 8.8% (down from 11.2% in the 2007 BGPS). However, some caution needs to be exercised when interpreting these data because gamblers rarely engage in just a single activity. In fact, those who played poker at a pub/club and played on FOBTs had the highest engagement in gambling activities, participating in 7.6 and 7.2 gambling activities respectively in the year prior to the survey. Among men, the mean number of gambling activities undertaken in the past year was highest among those who played poker at a pub/club (7.9), those who gambled on online slot machine style games (7.4), and those who played on fixed odds betting terminals (7.4). Among women, the mean number of activities engaged in was highest among those who played on fixed odds betting terminals (6.4), and those who bet on sports events (5.8). In short, it is problematic to attribute the negative impact to the availability of FOBTs (Forrest, 2013).

The secondary analysis by Wardle et al (2013) also noted that the rates of problem gambling and mean DSM-IV scores among FOBT players did not change significantly between each BGPS. Therefore, there does not appear to be any empirical evidence that problem gambling has increased since the introduction of FOBTs. However, findings did show that there had been a change in endorsement for some DSM items (e.g. chasing losses was endorsed more in the most recent survey). However, the authors noted that caution should be made when interpreting their results as the number of FOBT gamblers comprised approximately 250 individuals. As Forrest also noted:

“When a new gambling opportunity arises, such as fixed odds betting machines in the early 2000s, it may not only displace expenditure from other forms of gambling but also displace problem gambling activity (Reith, 2004). It is therefore hard to establish whether there is additional harm from the specific, newly available activity. Given the conceptual difficulties, and the considerable resources which would be required, there would appear to be little case at present for proposing a study of aggregate monetised economic and social costs in Great Britain from either gambling in the aggregate or from specific forms of gambling” (p.22).

In fact, Forrest (2013) published a comprehensive paper that considered the nature and scale of the benefits and costs of gambling, with special reference to machine gaming. He made the point that a large majority of past-year gamblers (87.2%) and more than two-thirds of slots players (68.4%) did not endorse a single item on any of the two problem gambling screens used in the most recent BGPS (Wardle, et al, 2011) “indicating that they displayed no indications of suffering any degree of dependence on, or harm from, gambling” (p.7). He then concluded that:

“Gambling in general and machine gaming in particular employ significant numbers of people. All gambling together contributes roughly 0.6 percent of GDP, making it a moderately important industry. However, its influence at the macroeconomic level is likely to be very limited to the extent that it simply displaces activity in other entertainment sectors...The last edition of the British Gambling Prevalence Survey included a question to elicit a self-evaluation of wellbeing. Recreational gamblers prove to be a little happier than non-gamblers but problem gamblers exhibit exceptionally low levels of wellbeing comparable to those found amongst victims of serious illness. Statistical modelling is unable to establish causation but the pattern is consistent with evidence (points 4 and 5 above) that aggregate benefits and costs from gambling are each very substantial, though dispersed amongst many people in the first case and concentrated in relatively few in the latter case” (p.30-31).

Problem gambling outside of Great Britain

Research into problem gambling has increased considerably over the last two decades. The BGPS studies are seen by most researchers in the gambling studies field as amongst the very best prevalence surveys conducted anywhere in the world. Consequently, direct comparison between problem gambling in Great Britain and elsewhere is not always possible as many published studies have major methodological limitations (particularly concerning representativeness). In a review by Griffiths (2010) examining problem gambling prevalence rates across Europe, the data collected in each country broadly fell into one of three categories (see Table 1 at the end of this report for a very brief overview of main findings in each country). These were:

- Countries that have carried out national surveys on gambling and/or problem gambling of varying representativeness, quality and empirical rigour (i.e. Belgium, Denmark, Estonia, Finland, France, Germany, Great Britain, Italy, The Netherlands, Lithuania, Sweden and Switzerland).

- Countries that have carried out research on gambling and/or problem gambling of varying representativeness, quality and rigour but at a regional and/or local level rather than a national level (i.e. Austria, Hungary, Romania, Russia, Slovakia, Slovenia and Spain).
- Countries where almost nothing is known empirically about gambling and/or problem gambling (i.e. Bulgaria, Cyprus, Czech Republic, Greece, Ireland, Latvia, Luxembourg, Malta, Poland and Portugal).

Griffiths concluded that problem gambling rates in Europe appeared to be similar to rates found elsewhere outside of Europe (typically 0.5%-2%), although a few countries (e.g. Estonia, Finland, Switzerland) had problem gambling prevalence rates of above 3%. The most recent national population based study on adults in the United States suggests that current problem gambling prevalence rates ranged from 1.3% (based on a DSM-IV screen) to 1.9% (based on the South Oaks Gambling Screen [SOGS]). However, there is a problem with comparing these prevalence figures to European findings as the prevalence rate of problem and pathological gambling varies considerably between instruments. The majority of the studies in North America have used the SOGS, but the SOGS and its derivatives tend to yield higher prevalence rates than DSM-IV derived measures.

A conservative solution is to compare the results from problem gambling surveys with other surveys that have used the same or similar type of screening instruments (e.g. different instruments based on the DSM-IV criteria – as the DSM-5 criteria have only been recently introduced). Relatively few studies in Europe report current prevalence rates for probable pathological gambling but the results from these studies suggest broadly similar rates to Great Britain (i.e. Iceland, Sweden, Norway, Denmark). For example:

- The current prevalence rates of probable pathological gambling (i.e. those individuals endorsing five or items out of ten on the DSM-IV) in Britain was 0.3%, in Sweden 0.3%, in Norway 0.3%, in Iceland 0.6%, and in Denmark 0.1%.
- North American research studies involving large samples, and meta-analyses, indicate that between 2.1% and 10% of older teenagers experience gambling problems (Barnes et al., 2009; Gupta & Derevensky, 2008; Ladouceur, Boudreault, Jacques & Vitaro, 1999; MacLaren & Best, 2010; Shaffer & Hall, 2001 [meta-analysis]; Shaffer, Hall, & Vander Bilt, 1999 [meta-analysis]; Welte et al., 2008; Westphal, Rush, Steven & Johnson, 2000; Winters, Stinchfield, & Fulkerson, 1993).
- Among adults, prevalence of gambling addiction is between 1 to 3% of the U.S. population as well as other countries such as Australia, Canada, China, Norway, Switzerland, and Spain (Becona, 1993; Bondolfi, Osiek, & Ferrero, 2000; Cook, 1987; Desai, Desai, & Potenza, 2007; French, Maclean, & Ettner, 2008; Ladouceur, Jacques, Ferland & Giroux, 1999; Petry, 2005; Petry, 2007; Phillippe & Vallerand, 2007; Schofield, Mummery,

Wang & Dickson, 2004 [lifetime]; Shaffer & Hall, 2001; Shaffer, Hall, & Vander Bilt, 1999; Stucki & Rihs-Middel, 2007; Sommers, 1988; Volberg, 1994 [lifetime]; Volberg & Steadman, 1988 [lifetime]; Wong & So, 2003), although a two large-sample studies found a prevalence of 0.15% in Norwegian adults (Gotestam & Johansson, 2003) and 4.2% among Texas [US] adults (Feigelman, Wallisch, & Lesieur, 1998 [lifetime measure]).

- Current prevalence rates of pathological gambling may be as high as 15% in some unique populations of teens and adults (e.g. Aboriginal population in North America; Wardman, el-Guebaly, & Hodgins, 2001).
- Sussman et al (2011) estimated a past year prevalence of gambling addiction of 2% in the general U.S. adult population (a figure more than twice as big as that in Great Britain).

Results from studies in different European countries suggest that problem gambling among adolescents is considerably higher than among adults. This has also been reported in numerous North American studies (Griffiths, 2010). Although problem gambling among adolescent samples tends to be higher than in adult samples, many of the participants used in these studies are either local surveys and/or use opportunistic or non-representative samples (Griffiths, 2010). However, in countries where there have been large samples with good representation (e.g. Great Britain), the problem gambling prevalence rate among adolescents is at least two to three times higher than in the adult population.

Problem gambling rates among older teenagers have shown variations worldwide. A fairly recent review of large-scale studies by Volberg, Gupta, Griffiths, Olason and Delfabbro (2010) examined studies on adolescent gambling in North America, Europe and Oceania. The rates of adolescent problem/pathological gambling reported in non-North American countries were as follows: Australia, 1% to 13%; Denmark, 0.8%; Estonia, 3.4%; Finland, 2.3%; Germany, 3%; Great Britain, 2% to 5.6%; Iceland, 1.9% to 3%; Italy, 6%; Lithuania, 4% to 5%; New Zealand, 3.8% to 13%; Norway, 1.8% to 3.2%; Romania, 7%; Spain, 0.8% to 4.6%; and Sweden, 0.9%.

This variation may have resulted from the stringency of the instrument used to measure problem gambling, each country's gambling laws, and/or subject sampling methods used. For instance, the use of DSM-IV-J/DSM-IV-MR-J instruments in youth studies in North America, Australia and Europe vary widely. The most recent prevalence rates of adolescent problem gambling (where four or more items out of ten items are endorsed on the DSM-IV-MR-J), is 2% in England and Wales, 9% in Scotland, 3.4% to 4.7% in Canada, and 4.4% Australia. Similar prevalence rates have though been reported in Spain, Iceland and Norway.

Literature reviews carried out in Australia and Great Britain have concluded that gaming machines tend to have a higher association with problem gambling than other forms of gambling (Delfabbro, King & Griffiths, 2012) although it must be stressed that there is no proven causal link between gaming machines and problem gambling. Other reviews also suggest that a range of structural characteristics impact on gambling behaviour (e.g. Griffiths & Auer, 2013; Parke & Griffiths, 2006; 2007). Relevant primary structural characteristics include the core technology of the EGM, i.e., the reinforcement schedule which determines the number and scale of reinforcement intervals (e.g. payout intervals) and conditions players to game operation, as well as the configuration of line betting (single v multiple lines), credit value (as virtual representation of money), the reel symbol ratio, accompanying bank note acceptors and spin speed (i.e. event frequency) (Parke & Griffiths, 2007).

Secondary characteristics include lighting, colour and sound effects (e.g., music, verbal interaction, sound of winning coins), machine theme, etc. The complex interrelationships between these structural characteristics produce interactive effects that may shape gambling behaviour, including the production of harm as measured by problem gambling segments (Griffiths & Parke, 2007).

Available research demonstrates that material change to structural characteristics may in some circumstances lead to transformation of gambling behaviour.

Reviews of the literature reveal that the number of correlates or potential risk factors of problem gambling are numerous, and it is possible that different combinations of a number of factors may explain the development of problem gambling for different individuals (Griffiths, 2007). Results from cross-sectional studies can be useful in terms of estimating the potential importance of such factors, although experimental and/or longitudinal studies are necessary for causal explanations. In general, the data show that problem gamblers invest more time, money and usually participate in a larger number of games than non-problem gamblers (e.g., Wardle, et al, 2011).

Problem gambling also seems to be more strongly associated with certain types of gambling than others. Research findings indicate that continuous games with an element of skill or perceived skill are more strongly associated to problem gambling than other types of games (Griffiths, 2007). Because of the lack of good data across Europe and other countries as a whole, there is a lack of correlation between levels of problem gambling and the type of market that gambling activity occurs in.

Gambling and co-morbid behaviours

As mentioned earlier in this report, gambling and problem gambling often co-occur with other potentially addictive behaviours. As noted above, this suggests that problem gambling is symptomatic of a more global disturbance in biopsychosocial functioning of individuals that have gambling problems. Among large older teen samples of heavy gamblers, co-occurrence with heavy use of alcohol or marijuana/other illicit drugs has been found to be 36% (Barnes et al., 2009) and 59% (Westphal et al., 2000). Among large samples of adult gambling addicts, 41% to 75% reported being current cigarette smokers (Becona, 1993; Desai, Desai, & Potenza, 2007; Potenza et al., 2006). In several small samples, 4% to 11.4% of adult gambling addicts reported alcoholism (Black & Moyer, 1998; Lesieur & Rosenthal, 1991; Netemeyer, Burton, Cole, et al., 1998).

In one large sample of gambling addicted adults that called a gambling helpline, 18% reported problems with alcohol use (Potenza et al., 2006), and in large samples of Spanish and Swiss adults, 14% and 36%, respectively, of probable gambling addicted adults reported alcohol abuse (Bondolfi, Osiek, & Ferrero,

2000). Sampled from large representative samples of U.S. adults, 25% and 33% of gambling addicts reported alcohol dependence (Desai, Desai, & Potenza, 2007; Welte et al., 2001). In fact, drinking alcohol is the most common substance used by people with gambling problems (Gordon, 2008).

Research has consistently shown that there is a high co-morbidity between pathological gambling and alcohol use disorders in both community and clinical samples (e.g. Bland, Newman, Orn, & Stebelsky, 1993; Daghestani, Elenz, & Crayton, 1996; Elia & Jacobs, 1993; Lesieur, Blume, & Zoppa, 1986; Smart & Ferris, 1996; see also review by Crockford & el-Guebaly, 1998). To summarise more specifically, high co-morbidity rates of gambling and drinking alcohol have been found among:

- Pathological gamblers (e.g. Dannon, et al, 2006; Ladd & Petry, 2005)
- Treatment-seeking pathological gamblers (e.g. Ciarrocchi & Richardson, 1989; Ibanez, et al, 2001, Kausch, 2003; Ladd & Petry 2003; Lesieur, Blume & Zoppa, 1986; Ramirez, McCormick, Russo & Taber, 1984; Rash, Weinstock & Petry, 2011; Stinchfield, et al, 2005; Toneatto, Skinner & Dragonetti, 2002)
- Alcohol-dependent patients (e.g. Maccallum & Blaszczyński, 2001)
- Psychiatric outpatients (e.g. Zimmerman, Chelminski & Young, 2006)
- Casino employees (Shaffer, et al, 1999; Shaffer & Hall, 2002),
- Adolescents (Barnes, et al, 2005; 2009; Sutherland & Griffiths, 1998; Walker, Clark & Folk, 2010; Westphal, et al, 2000)
- Young adults (e.g. Slutske, Caspi, Moffitt & Poulton, 2005)
- Elderly gamblers (e.g. Vander Bilt, Dodge, Pandav, et al., 2004), Native Americans (e.g. Ella & Jacobs, 1993)
- Adults in regional populations (e.g. Momper, Delva, Grogan-Kaylor, et al., 2010)
- Adults in large national and/or epidemiological surveys (e.g. Petry, et al., 2005; Wardle, et al., 2007; 2011)

Survey population research at a national level has consistently found an association between levels of self-reported gambling-related problems and at-risk levels of alcohol consumption in many countries' including the United States (Cunningham-Williams, et al., 1998; Feigelman, et al., 1998; Gerstein, et al, 1999; Kessler, et al, 2008; Petry, et al, 2005; Welte, et al., 2001), Canada (Afifi, et al., 2010), New Zealand (Abbott & Volberg, 1992), Switzerland (Bondolfi et al., 2000; 2008), Korea (Park, Cho, Jeon, et al., 2010), United Kingdom (Griffiths, Wardle, Orford, et al., 2010), Sweden (Statens Folkhälsoinstitut, 2012; Froberg, Hallqvist & Tengstro, 2012), Australia (Dickerson, Baron, Hong & Cottrell, 1996), and Spain (Becona, 1993).

Lorains, Cowlshaw and Thomas (2011) arguably carried out the best (and most recent) meta-analytic review relating to the prevalence of common co-morbid disorders (including alcohol use disorder), and pathological gamblers in nationally representative population samples. They carried out a systematic search for both peer-reviewed and non-peer reviewed reports between January 1998 and September 2010. Their review only included studies that (i) examined the prevalence of co-morbid conditions in problem and/or pathological gamblers, (ii) used general population samples, (iii) used randomized sampling methods, and (iv) used standardised measures of the co-morbid behaviours. They then used meta-analysis techniques to synthesize the data. Using these inclusion criteria, only 11 eligible studies were identified from the literature. Of these, eight studies assessed alcohol use disorder (AUD). The studies included:

- Six studies from the United States:
 - Cunningham-Williams, et al, 1998 (44.5% AUD; n=3,004)
 - Feigelman, et al, 1998 (AUD not assessed; n=6308)
 - Gerstein, et al, 1999 (9.9% AUD; n=2,417)
 - Kessler, et al, 2008 (AUD not assessed; n=9,282)
 - Petry, et al, 2005 (73.2% AUD; n=43,093)
 - Welte, et al, 2001 (18.0% AUD; n=2,638)
- Two studies from Canada:
 - Afifi, et al, 2010 (AUD not assessed; n=10,056)
 - Marshall & Wynne, 2004 (15.0% AUD; n=34,770)
- Two studies from Switzerland:
 - Bondolfi et al, 2000 (36.0% AUD; n=2,526)
 - Bondolfi et al, 2008 (13.5% AUD; n=2,083)
- One study from Korea:
 - Park, et al, 2010 (30.2% AUD; n=5,333)

Their results from across the 11 studies indicated that problem and pathological gamblers had high rates of other co-morbid disorders. The highest mean prevalence was for nicotine dependence (60.1%), followed by a substance use disorder (including alcohol use disorder) (57.5%), any type of mood disorder (37.9%) and any type of anxiety disorder (37.4%). However, they noted *“there was evidence of moderate heterogeneity across studies, suggesting that rate estimates do not necessarily converge around a single population figure, and that weighted means should be interpreted with caution”* (p.495).

In another comprehensive review, Sussman, et al (2011) estimated that 50%, 30%, and 20% of gambling addicts also are cigarette, alcohol, and illicit drug use addicts, respectively. The alcohol and drug use co-occurrence estimates are a little lower than those suggested by Freimuth et al. (2008), and Kausch (2003), but are based on a larger pool of studies (albeit not a large pool). Sussman et al (2011) also reported that addictions to gambling, eating, the internet, love, sex, and exercise appear to have a prevalence rate around 2% to 3% internationally, and involving a minority of the population. Addictions to alcohol, cigarette smoking, illicit drugs, work, and shopping appear to have a prevalence rate of around 5% to 15% of the population.

Therefore, problem gambling appears to be much less of an issue than some other potentially addictive behaviours. It is not clear why these different behaviours differ in prevalence. One may speculate that addictions directly involving relatively immediate aversive consequences (e.g. quick financial loss, social rejection, injury from overtraining) would tend to be the lowest in prevalence.

Conclusions

This brief review has demonstrated that problem gambling in Great Britain is a minority problem that affects less than 1% of the British population and that the prevalence rate is much lower than in most other countries. Problem gambling also appears to be less of a problem than many other potentially addictive behaviours. The latest British research tends to suggest that the prevalence rate of problem gambling is slightly declining. Data also appears to suggest that since 2010, that rate of problem gambling in England has dropped by around 40% but the rates of problem gambling in Scotland have held relatively stable. Rates of pathological gambling appear to be extremely low and in some surveys were not even reported as the base sizes were simply too small.

Empirical evidence strongly suggests that behaviours that are not restricted by society, or are even promoted by society (demonstrating the least immediately aversive consequences), would tend to be of highest prevalence (e.g. cigarette smoking in some locations, alcohol use, work, and shopping are relatively socially accepted). The data also suggests that aspects of the large social environment impacts on popularity of mode of expression (if not reporting) of addictive behaviour. There are many other reasons that may partially explain differences in prevalence rates including factors such as how accessible the activity is to the user. Most of the highly prevalent addictive behaviours are highly accessible by the population.

Sussman et al (2011) also note that the relative likelihood of participating in multiple addictive behaviours concurrently may be impacted by financial cost and activity demands. For example, for an addicted gambler who spends much time in a gambling venue, possibly most financial resources will go into the maintenance of the gambling behaviour leaving very few financial resources left to participate in other costly activities. Also, the addicted gambler may not have much additional time to leave the gambling venue and engage concurrently in shopping, sex, work, or exercise addictions. On the other hand, the gambling venue social context may promote tobacco and alcohol addictions, and may tolerate other drug addictions. This may partly explain why drug addictions tend to have a higher prevalence and co-occurrence than some process/behavioural addictions (i.e. drug addictions can be adapted into most behavioural repertoires including day-to-day work and leisure time). Further research is needed to assess prevalence, and all possible patterns of co-occurrence, of addictive behaviours within the same large samples of persons.

Vulnerable individuals may attempt to continuously manipulate their neurobiological circuitry in order to obtain a more comfortable subjective state. Also, it is likely that society promotes some addictive behavioural processes, such as drinking alcohol, overeating, or working to excess. It is quite reasonable to assert that at least a large minority of the world's population suffers from an addictive process at any point in time. While controversial, a high prevalence of some type of addiction among a significant minority of the population might suggest that addiction is a natural state of affairs as a human being. As Marks (1990) provocatively suggested, "life is a series of addictions and without them we die" (p.1389). Clearly, much more research is needed in this arena.

Gambling is a relatively new emerging field of education and research. Some may argue that the existing knowledge base for the formulation of evidence-based policies is small (especially when compared with other potentially addictive behaviours). Although there is growing research worldwide on problem gambling, at a societal level, the economic and social impacts of gambling, its role in public policy and its public health implications are under-researched. Systematic research strategies and programmes underpinned by independent decision-making about information needs and priorities, transparent processes, stakeholder input and widespread dissemination of research results are needed worldwide.

High levels of substance misuse and some other mental health disorders among problem gamblers highlight the importance of screening for gambling problems among participants in alcohol and drug treatment facilities, mental health centres and outpatient clinics, as well as probation services and prisons. Unfortunately, beyond programmes that provide specialised problem gambling services, few counselling professionals screen for gambling problems among their clients. Even when a gambling problem is identified, non-specialist professionals are often uncertain about the appropriate referrals to make or what treatments to recommend (Abbott, Volberg, Bellringer & Reith, 2004). There is clearly a need for education and training in the diagnosis, appropriate referral and effective treatment of gambling problems.

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Appendix 1: DSM-5 Diagnostic Criteria for Gambling Disorder

(American Psychiatric Association, 2013)

- A. Persistent and recurrent problematic gambling behavior leading to clinically significant impairment or distress, as indicated by the individual exhibiting four (or more) of the following in a 12-month period:
1. Needs to gamble with increasing amounts of money in order to achieve the desired excitement.
 2. Is restless or irritable when attempting to cut down or stop gambling.
 3. Has made repeated unsuccessful efforts to control, cut back, or stop gambling.
 4. Is often preoccupied with gambling (e.g., having persistent thoughts of reliving past gambling experiences, handicapping or planning the next venture, thinking of ways to get money with which to gamble).
 5. Often gambles when feeling distressed (e.g., helpless, guilty, anxious, depressed).
 6. After losing money gambling, often returns another day to get even (“chasing” one’s losses).
 7. Lies to conceal the extent of involvement with gambling.
 8. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling.
 9. Relies on others to provide money to relieve desperate financial situations caused by gambling.
- B. The gambling behavior is not better explained by a manic episode.

Appendix 2: Summary of country-by-country data on gambling and problem gambling in Europe

Country	Gambling prevalence	Most popular gambling activities	Problem gambling prevalence	Instrument	Quality of data
Austria	Not known	Lotteries Slot machines	Not known		Poor
Belgium	60% (past year)	Lotteries Scratchcards	2% (past year)	DSM-IV	Medium
Bulgaria	Not known	Not known	Not known		Poor
Cyprus	Not known	Not known	Not known		Poor
Czech Republic	Not known	Not known	Not known		Poor
Denmark	[Not reported]	[Not reported]	1.7% (lifetime) 0.7% (lifetime)	SOGS-RA NODS	Medium
Estonia	75% (past year)	Lotteries Slot machines	6.5% (past year)	SOGS	Medium
Finland	74% (past year)	Lotteries Scratchcards	5.5% (past year)	SOGS-R	Good
France	48% (past year)	Horse racing Lotteries/Rapido	1.3% (past year)	CPGI	Good
Germany	39% (past year)	Lotteries Scratchcards	1.2% (past year)	DSM-IV	Good
Great Britain	68% (past year)	Lotteries Scratchcards	0.6-0.9% (past year) 0.5-0.7% (past year)	DSM-IV CPGI	Good
Greece	Not known	Sports betting Lotteries	Not known		Poor
Hungary	19% (monthly)	Lotteries	7% (“heavy gamblers”)		Poor
Iceland	69% (past year)	Lottery Scratchcards	1.1% (past year)	DSM-IV	Good
Ireland	59% (past year lottery)	Lotteries Sports betting	Not known		Poor
Italy	80% (past year)	Lotteries	2% (past year)	CPGI	Good
Latvia	Not known	Not known	Not known		Poor
Lithuania	30% (lifetime)	Sports betting Slot machines	Not assessed	[None used]	Poor
Luxembourg	Not known	Not known	Not known		Poor
Malta	54% (18-24 year olds - past year)	Lottery Scratchcards	Not known		Poor
The Netherlands	87% (lifetime)	Lottery Scratchcards	2.5% (lifetime)	SOGS	Good
Norway	[Not reported]	Lotteries Football pools	1.4% (lifetime)	NODS	Medium
Poland	60% (lottery past year)	Lotteries	Not known		Poor
Portugal	Not known	Slot machines	Not known		Poor
Romania	Not known	Casinos	Not known		Poor
Russia	75% (past year)	Lotteries Casinos	Not known		Poor
Slovakia	Not known	Slot machines Lotteries	Not known		Poor
Slovenia	Not known	Casinos	Not known		Poor
Spain	[Not reported]	Slot machines Lotteries	0.9%-2.5% (Lifetime)	Various	Medium (localised)
Sweden	[Not reported]	Lotteries	2.0% (past year)	SOGS-R	Medium
Switzerland	[Not reported]	Lotteries	3.3% (lifetime)	SOGS	Poor

Key: CPGI = Canadian Problem Gambling Index; DSM-IV = Diagnostic and Statistical Manual, Fourth Edition; DSM-IV-J = DSM-IV Junior Version; DSM-IV-MR-J; DSM-IV Junior Multiple Response Version; NODS = National Opinion Research Center DSM Screen For Problem Gambling; SOGS = South Oaks Gambling Screen; SOGS-R = Revised South Oaks Gambling Screen.