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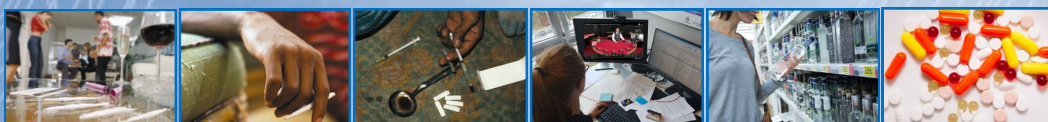
# The epidemiology and impact of gambling disorder and other gambling-related harm

*Discussion paper*

*developed for the WHO Forum on Alcohol, Drugs and Addictive Behaviours,*

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# The epidemiology and impact of gambling disorder and other gambling-related harm

Discussion paper for the 2017 WHO Forum on alcohol, drugs and addictive behaviours, WHO Headquarters, Geneva, 26-28 June 2017

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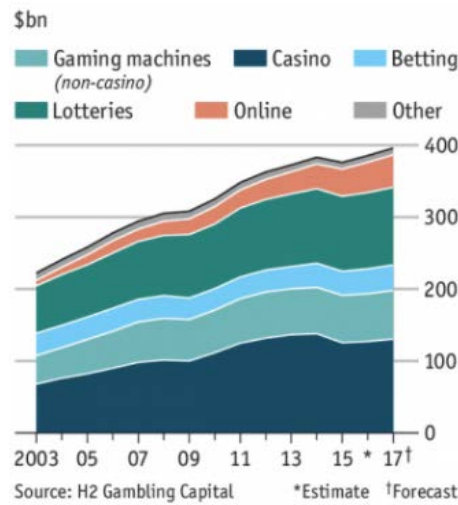
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## Key Messages

- There has been massive, unprecedented growth in commercial gambling in recent decades. This is expected to continue, expanding in new, high-risk populations and fuelled globally by ready on-line access.
- This growth has been associated with a substantial increase in problem gambling, associated morbidities and other gambling-related harm. Adult past year problem gambling prevalence rates range from range from 0.1% to 6.0%, with two to three times as many people experiencing less serious sub-clinical problems.
- The gambling-related burden of harm appears to be of similar magnitude to harm attributed to major depressive disorder and alcohol misuse and dependence. It is substantially higher than harm attributed to drug dependence disorder.
- Serious problem gambling, referred to as pathological gambling, was first included in the DSM-III in 1980. In the DSM-V it was renamed gambling disorder and placed in the new 'Addictions and Related Disorders' category. It is the only non-substance addiction included.
- Despite the global increase and extent of gambling-relating morbidity and harm, and long recognition of problem gambling as a mental health disorder, it has rarely been seen as a public health issue or priority.
- There is an urgent need to place gambling on national and international public health agendas and strengthen evidence-based policy and prevention strategies, as well as greatly extend early intervention and treatment provision. These measures are critical to reduce current and future harm and social costs associated with commercial gambling.

Gambling has a long pedigree, going back millennia and pervading many cultures and societies. Since the mid-1980s there has been unprecedented growth in commercial gambling and annual global gambling losses were estimated to total \$400 billion in 2016 (Bogart, 2011; The data team, 2017). This growth is driven by increasing acceptance of legal gambling, the intersection of gambling and financial technologies, impacts of internet and mobile devices, the spread of gambling to traditionally non-gambling settings and other globalisation forces (Abbott & Volberg, 1999). The interest of governments in increasing revenue played a significant part (Hodgins & Petry, 2016). Although gambling expenditure has levelled off or declined in some jurisdictions, there is strong growth in others, including some of the world's largest nations. There is also strong growth, globally, in on-line gambling. While now widespread, some societies previously had limited experience of gambling and it remains legally prohibited in some parts of the world (Binde, 2005). Other societies have undergone cycles of liberalisation and restriction going back hundreds of years. Restriction

typically arose from rising public concern about escalating gambling-related personal and social



harm (Miers, 2004; Rose, 2003).

**Figure 1: Global gambling losses (Source: The data team, 2017)**

Problem gambling is one of the negative impacts of the post mid-1980s gambling expansion (Abbott & Volberg, 1996). As in the past, concerns about these impacts on the part of civil society and governments has led to policy and other initiatives intended to reduce harm associated with this expansion (Volberg et al., 1996). Legal and regulatory frameworks vary in the extent to which this intent is addressed. There has been a focus on problem gambling and the provision of information, self-help and treatment. However, such provision is highly variable and rarely comprehensive. Problem gambling and other gambling-related harm are not widely regarded as a health issue or priority. There are, however, a few jurisdictions where they are being addressed as a public health issue with an emphasis on prevention as well as treatment.

During the past 30 years, gambling research has grown considerably, especially in relation to problem gambling. A number of brief and longer-term treatment interventions, both behavioural and pharmacological, have been developed. Some have received favourable evaluations. Many, however, have methodological shortcomings and effectiveness studies in clinical settings are rare. A wide range of harm reduction and prevention initiatives have also been developed. A number of these have been evaluated and some found to be promising. Most have not been widely implemented and a recent reviewer concluded that the measures least likely to be effective are the ones most often taken (Williams, West & Simpson, 2012b).

Relatively little research attention has been given to wider gambling-related harms. It is only in the past year that burden of harm methodologies have been applied to gambling. Australian and New Zealand studies found the burden of harm associated with gambling is somewhat similar in magnitude to major depressive disorder and alcohol misuse and dependence (Browne et al., 2016; 2017). The New Zealand study found the burden of harm was 0.63 and 0.77 times less, respectively, than for these disorders (Brown et al., 2017). The gambling-related burden of harm was 2.5 times more than diabetes and 3.0 times more than drug use disorder. The burden is primarily due to

financial impacts, damage to relationships and health, emotional/psychological distress and adverse impacts on work and education. This burden is disproportionately carried by disadvantaged and marginalised population sectors and contributes to health and social disparities.

Serious problem gambling was referred to as pathological gambling when first included in the DSM-III in 1980. It was placed in the impulse-control disorders category. Pathological gambling was renamed gambling disorder in the DSM-V and moved to the new category of 'Addictions and Related Disorders'. Gambling disorder is the only non-substance addiction in the new category. Its inclusion was based on extensive research demonstrating commonalities between serious problem gambling and substance use disorders. (Hodgins, Stea & Grant, 2011; Petry et al., 2014; Wakefield, 2013; Welch, Klassen, Borisova, & Clothier, 2013).

Pathological gambling was initially conceptualised as a chronic or chronically relapsing disorder. Reflecting this, early assessment tools for clinical and research purposes were 'lifetime' measures, with no requirement that diagnostic criteria were met within a specified time-frame. Subsequent research, including prospective clinical and general population studies, indicated that problems are often episodic and transient (Abbott, Bellringer, Garrett, & Mundy-McPherson, 2016). These findings are taken into account in the DSM-V. It allows for distinction between episodic and continuous variants, as well as for a gambling disorder to be in early or sustained remission. Additionally, depending on the number of criteria met, the disorder is referred to as mild, moderate or severe.

National current (past 12 months) pathological gambling prevalence rates range from 0.1% to 6.0% (Calado & Griffiths, 2016). Typically two to three times as many people experience less serious, subclinical problem and at-risk gambling. Prevalence estimates are influenced by the screening measures used and a variety of methodological factors. Williams and colleagues reviewed surveys conducted world-wide and applied weightings to adjust for methodological differences (Williams, Volberg, & Stevens, 2012a). This enabled more valid comparisons to be made across jurisdictions and over time. They found prevalence rates are generally low in Europe, high in Asia, and intermediate in Australasia and North America. In regions where sufficient surveys had been conducted to assess trends (Australia, Canada and the United States) they found problem gambling prevalence initially increased and then, over time, decreased. Although gambling availability and consumption (participation and expenditure) were not directly examined in relation to prevalence, in these jurisdictions gambling availability increased throughout the period considered. A meta-analysis of 34 Australian and New Zealand surveys conducted since 1990 examined problem gambling prevalence in relation to the number of electronic gaming machines per capita in the year surveys were conducted (Storer, Abbott & Stubbs, 2009). Prevalence both increased in association with higher EGM density and decreased over time. Both relationships were strong, accounting for almost three-quarters of the prevalence variation.

The foregoing studies provide support for both the availability and adaptation hypotheses. The former proposes that increased gambling availability leads to increased participation and increased problem gambling. The latter proposes that over time adaptation ('host' immunity and protective environmental changes) occurs and gambling participation and problem levels reduce, even when

gambling availability increases. There is little doubt that greater gambling availability has led to increased consumption and increased problems in many parts of the world. However, in both expanding and maturing markets, gambling consumption and problem gambling rates can decline, sometimes markedly, rather than increase. While reductions in gambling consumption and problems occur together in these situations, recent studies conducted in New Zealand, Sweden and Australia have found a different pattern (Abbott, 2017a; Abbott, Romild & Volberg, 2014; Abbott, Stone, Billi, & Yeung, 2016). Substantial reductions in gambling participation occurred in these jurisdictions. Rather than decreasing, however, prevalence rates remained unchanged. Two of these studies found particularly large decreases in youth gambling participation (Abbott et al. 2014, 2016). In both cases problem gambling prevalence increased in this population sector. These findings are not consistent with either availability or adaptation. Their explanation requires consideration of factors, additional to gambling exposure, that are implicated in the onset and progression of problem gambling.

While many factors contribute to the onset (incidence) of problem gambling, both initially and in cases of relapse, gambling participation measures are the most strongly implicated (el-Guebaly et al., 2015; Williams et al., 2015). Frequent participation in gambling activities that are continuous in nature and involve an element of actual or perceived skill are particularly strongly linked to problem gambling. This includes EGMs, casino table games, poker, betting on racing and sporting events and some forms of bingo. Participation in multiple gambling forms, high gambling expenditure, commencing gambling at a young age and experiencing an early big win are additional risk factors. Further gambling-related factors include having family members or friends who are regular and/or problem gamblers, gambling being a favoured leisure activity and membership of gambling rewards programmes.

Males, young adults, low-income and non-married people are almost universally found to be at elevated risk. Indigenous and some ethnic minority groups also have high incidence and prevalence rates. Additional risk factors identified in a number of studies include living in high deprivation neighbourhoods, membership of particular religious groups, lack of formal education and unemployed status. Many of these high risk groups live disproportionately in neighbourhoods that, in addition to being deprived, contain high concentrations of gambling venues and outlets. Residential proximity to gambling venues has also been shown to be associated with problem gambling. Some of these at-risk groups have low levels of gambling participation and limited prior exposure to more hazardous forms of gambling. It appears likely that the combination of heightened vulnerability, economic and social disadvantage and high gambling exposure plays a major part in problem gambling development (Abbott, 2017a). This combination may also, in part, explain the plateauing of problem gambling prevalence rates when general population gambling participation and expenditure rates are falling.

Another likely explanation for plateauing prevalence rates in the face of reduced gambling participation is that populations with many years of exposure to gambling will contain substantial numbers of past problem gamblers who are prone to relapse. Recent prospective studies (Abbott et al. 2015, 2016; Billi, Stone, Marden, & Yeung, 2014; Public Health Agency of Sweden, 2016; Romild, Volberg, & Abbott, 2014; Williams, et al. 2015) in populations of this type found that, of current

problem gamblers, between a half to two-thirds became a problem gambler during the previous 12 months. Of these 'new' problem gamblers between a third to two-thirds were past problem gamblers who relapsed.

Pathological and problem gambling are highly co-morbid with a large number of other mental health disorders, particularly substance use disorders (Petry, 2005; Rash, Weinstock, & Patten, 2016). Problem gamblers also have substantially higher rates of mood, anxiety and personality disorders. In some cases problem gambling precedes the onset of the co-morbid disorder and in other cases the temporal relationship goes the other way. Two of the recent prospective studies found that substance abuse and dependence and behavioural addictions were robust predictors of future problem gambling. These studies also found that other mental health disorders predicted problem gambling. Early negative childhood experience including abuse and trauma also appear to be linked to later problem gambling development (Felsher, Derevensky, & Gupta, 2010).

Genetic and molecular genetic studies indicate a substantial heritable contribution to problem gambling. The co-occurrence of gambling and alcohol use disorders appears to be partially attributable to genes that affect both disorders. There are substantial bodies of cognitive, neurocognitive and neurobiological research that identify cognitive characteristics and deficits and multiple neurotransmitter systems that appear to underlie significant emotional, cognitive and behavioural aspects of problem gambling (Hodgins, Stea, & Grant, 2011). Problem gamblers are highly prone to cognitive distortions including over-rating their own gambling skill, illusions of control, illusory associations, superstitious beliefs, interpretive biases, e.g. the belief that a win will come after a number of losses (gambler's fallacy), and selective memory.

Problem gambling prevalence is determined both by the inflow of new problem gamblers (incidence) and outflow – through recovery, remission, migration and death. From prospective general population studies it is known that problem gambling prevalence rates usually remain much the same over a period of a few years. However, in any given year, around half move out of the problem gambling category and are replaced by 'new' problem gamblers. As mentioned, this includes both first-time and relapsing cases. The relative proportions will likely vary across jurisdictions and demographic groups within jurisdictions – partly a consequence of differences in their history of exposure to gambling. Reducing the prevalence of problem gambling, and to some extent associated harms, requires implementing primary prevention measures to lower the rate of problem onset, as well as treatment and other measures to accelerate recovery or remission and prevent relapse. While further research is required, it appears that many of the factors implicated in problem gambling development also contribute to problem chronicity and relapse.

A variety of policy and prevention approaches have been developed to reduce the prevalence of problem gambling and gambling related harm (Williams et al., 2012b). Those that focus on the agent gambling include measures intended to (1) reduce gambling supply, (2) reduce the potency of gambling activities and participation and (3) reduce demand. Supply reduction interventions include legal and regulatory measures to: prohibit or reduce the number of gambling venues and outlets, either generally or selectively (e.g. in vulnerable neighbourhoods); reduce access hours; impose access restrictions (e.g. based on age or resident status); and, implement venue exclusion. In the

case of EGMs, the main contributor to gambling harm in most jurisdictions where they have been widely introduced, potency reduction measures include modifying game parameters such as speed of play, number of near misses, bet size and mandatory pay-outs; enforced breaks in play; static and dynamic messaging, self-appraisal messaging, monetary and time-based pop-up messaging; normative feedback and enhanced messaging; limit setting (pre-commitment), behavioural tracking tools; and prohibition and modification of note acceptors. Demand reduction measures include smoking bans; prohibiting or limiting alcohol use while gambling, restricting access to money (e.g. credit and ATMs); modifying venue design; restricting advertising, promotions and sponsorship; information and awareness campaigns, education regarding gambling and gambling harm; changing attitudes; changing cognitions; venue staff training and host responsibility programmes; on-site information and/or counselling centres, helplines and on-line face-to-face interventions for problem gamblers and significant others.

It is not known how effective most of the foregoing measures are and, as mentioned, it appears that those likely to be least effective are the ones most frequently deployed. This is perhaps not unexpected as problem gamblers account for a large proportion of gambling revenue, for instance, as much as 40% in the case of EGMs in Australia (Australian Government Productivity Commission, 2010). Governments and gambling providers seek to maximise revenue and profits; both of which are likely to fall, probably substantially, if prevention and harm reduction measures are fully and effectively implemented. Hancock and Smith (2017) maintain that the widely followed Reno Model of responsible gambling intended to provide consumer protection and reduce gambling-related harm, paradoxically, is an impediment to implementation of effective prevention and harm reduction measures. In large part, this attributed to the model's emphasis on individual responsibility and problem gamblers. They call for this approach to be incorporated within broader framework that includes public health principles, consumer protection, duty-of-care, regulatory responsibility and independent research.

While much of the research and policy focus has been on problem gambling, as with a number of other public health issues, it has been shown that most of the harm associated with gambling participation is generated by gamblers other than problem gamblers (the 'prevention paradox'). A recent Victorian study found that only 15% of harm was attributable to problem gamblers. Most harm was occasioned by people classified as low or moderate-risk gamblers (Browne et al. 2016). This occurs because while problem gamblers and people associated with them experience high levels of harm, they are greatly outnumbered by subclinical gamblers. Consequently it is important that this group is also the focus of regulatory and preventive interventions.

Given the very high levels of gambling-related harm in some population sectors targeted as well as more universal approaches will be required to reduce harm and disparities between different ethnic, socioeconomic and other social groups (Abbott, 2017b). Many of the non-gambling risk and protective factors for at-risk and problem gambling are common to other mental health and addiction disorders. Reducing these risk factors and strengthening protective factors can be expected to have health and social benefits that extend beyond problem gambling and gambling-related harm.



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