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Setting Limits: Gambling, Science and Public Policy—summary of results

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ABSTRACT

The gambling industry has grown into a global business in the 21st century. This has created the need for a new emphasis on problem prevention. This article highlights the core themes of the book *Setting Limits: Gambling, Science and Public Policy*, taking a broad view of the consequences of gambling for society as a burden on health, well-being and equality. The book covers the extent of gambling and gambling-related problems in different societies and presents a critical review of research on industry practices, policy objectives and preventive approaches, including services to people suffering from gambling and its consequences. It discusses the developments in game characteristics and gambling environments and provides evidence on how regulation can affect those. Effective measures to minimize gambling harm exist and many are well supported by scientific evidence. They include restrictions on general availability as well as selective measures to prevent gamblers from overspending. The revenue generated from gambling for the industry, governments, and providers of public services funded from gambling returns presents an obstacle to developing policies to implement harm-reduction measures. A public interest approach must weigh these interests against the suffering and losses of the victims of gambling.

Keywords Availability, gambling, policy, prevention, selective restrictions, total consumption, treatment.

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THE HISTORY OF REGULATION AND FRAMING THE ISSUE

Public policy addressing harms from gambling has encountered new challenges in recent decades. Games involving betting on random outcomes have a history as long as human culture, but gambling with money has grown into commercial mass entertainment only since the 1980s. The accelerating growth in the late twentieth and twenty-first century has entailed new games and opportunities added to traditional horse racing, sports betting, state lotteries, casino games and mechanical slot machines. New games include electronic gambling machines (EGM) and video lottery terminals (VLT). Online technology leads to merging and mixing several types of games. It increases their event frequencies and offers unlimited gambling opportunities everywhere. The boundary between social gaming and gambling is blurred and disappearing.

Government control is not new either; the history of gambling is also a history of regulation, but the growth of the industry has reframed policy concerns. Consumer protection and prevention of fraud and crime remain pertinent concerns, but with a new emphasis on problem behaviour and its consequences. While a greater prevalence of gambling requires greater attention to the harm, it also generates political interest in revenues attained from the activity. Policy responses must attend to these interests, while making sure that regulation corresponds to its chosen goals on the basis of evidence. These policy responses constitute the core of the book *Setting Limits: Gambling, Science and Public Policy*.

The industry justifies gambling as a legitimate economic activity if only individual problem behaviour could

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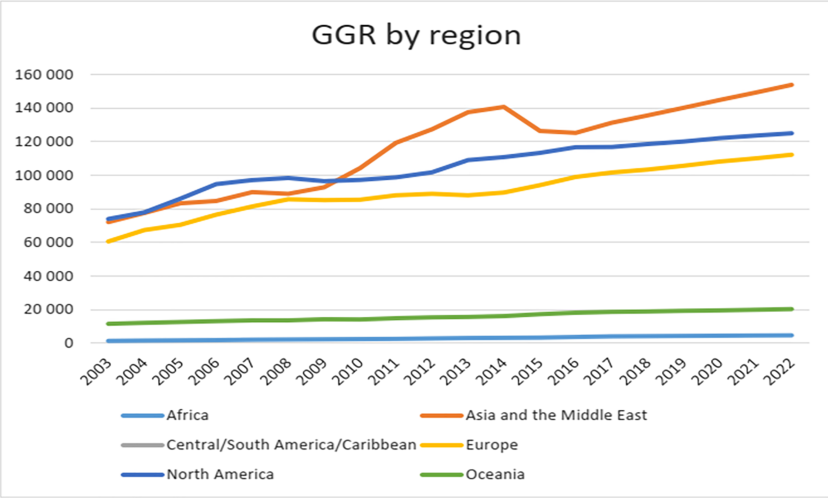


Figure 1 Annual gross gambling revenue (GGR) in million euros by global regions between 2003 and 2022. Not adjusted for inflation. Figures for 2019–22 are estimates, not accounting for the impact of COVID-19 [Colour figure can be viewed at wileyonlinelibrary.com]

be minimized. The book widens this view to include the effects of the activity on inequality and its burden on vulnerable populations. The perspective is enlarged to a public interest in the distribution of health, wealth and well-being [1]. The public health approach applied in the book serves as a starting point for policy consideration. As in the case of alcohol [2] and drugs [3], it addresses consequences rather than the activities themselves, and is concerned with harm in populations rather than only in individuals. In this article we summarize the main themes of the book, considering the changing context of the global gambling industry and the economic dependencies it creates.

GLOBAL GROWTH AND CHALLENGES FOR REGULATION

Figure 1 presents the growth of recorded gambling by world regions. It has exceeded 400000 million euros in 2019 measured as Gross Gambling Revenue (GGR), which equals the total sum of bets placed minus winnings paid out to gamblers. The global volume approximately doubled since the beginning of the twenty-first century. The biggest markets by world region are Asia, North America, and Europe, whereas Australia and New Zealand are among the highest spending countries as measured per capita. Africa, and Latin America and the Caribbean are the areas where active preventive steps must be taken to stop the expansion of gambling seen in other regions.

Associated with governments' relaxed restrictions for the activity, gambling participation started to increase well before the introduction of the internet. State lotteries were often the first forms offered to general publics, followed by opportunities to gamble on mechanical and then electrical machines and other commercial formats. The gambling industry has become concentrated into a small number of corporations, many of them operating on a global scale. Many governments have justified the growth and commercialization of gambling as a source of tax revenue, and as support for 'good causes'. Federal, state, regional and local governments, as well as associations, charities, sports organizations, institutions receiving gambling-based contributions through ministries, and other servants of the good causes, have become beneficiaries of commercial gambling, increasingly dependent on revenue from it.

HARMS FROM GAMBLING

Gambling disorder is included as a behavioural addiction in the 11th revision of the International Classification of Diseases adopted in 2019 by the World Health Organization. Several diagnostic characteristics are similar to those in addictive substance use, and analogous criteria are included in self-report tests and in prevalence estimates of pathological, problem, and at-risk gambling.

Gamblers typically report problems in their financial situation, with relationships and family, work, procuring money illegally, and other criminal behaviour. Substantial research shows that high risk or problem gambling co-occurs with heavy alcohol and other drug use, as well as mental health problems [4, 5]. Elevated suicide risk is consistently associated with gambling harms in numerous studies.

[6, 7]. Although more than one half of the population participate in gambling in most high-income countries, measurements of problem behaviour usually give prevalence rates of 1% to 4% for problem gambling [8], and in the range of 0.1% to 0.8% for the most severe degree called

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pathological gambling [9]. Prevalence rates, however, underestimate the burden of harm for methodological reasons. These include errors in sample selection, non-response bias, inaccurate self-reporting, social acceptability, and technical errors [10].

Observed prevalence rates underestimate the burden of harm for two additional reasons relevant for prevention policy. First, individuals may suffer from past gambling even if they are not identified as current problem gamblers in surveys [11, 12]. Second, gambling causes harm to others. Estimates vary greatly but it is safe to say that at least six other persons will be affected by each problem gambler [13, 14]. Others harmed form a greater proportion of the population than problem gamblers themselves, in the range of 2% to 20% [15]. They report gambling-related harms including emotional distress, financial problems, and health impacts [16]. Gamblers' partners present higher levels of substance use disorder, problem gambling, and suicide attempts than comparison groups or the general population. Other issues include family disruption, domestic violence and harm to children's health and welfare [17]. One systematic review concludes, however, that the direction of causality is not always clear, as gambling might also result from problematic relationships [18].

Gambling is associated with crime in six ways. (1) Fraud and match-fixing in sports games are common [19]. (2) Organized crime uses gambling to commit illegal acts such as money laundering, and is interested in all forms of gambling: legal, paralegal, and illegal [20, 21]. (3) Gambling may increase corruption [22]. (4) Gambling accessibility is associated with domestic violence [23, 24], and problem gamblers are more likely than the average population or moderate gamblers to commit crimes [25, 26]. Levels of problem gambling have been found to be high among criminal offenders [27]. (5) Individuals may commit crimes in order to procure resources for gambling or to pay for gambling losses [28]. (6) Illegal or unauthorised gambling is a ubiquitous problem for regulators, increasing with growing online supply. Liberal gambling laws are often justified as a measure to attract consumers to the regulated market, but the introduction of new legal products may also lead gamblers to access sites offering high-risk games without authorization [29].

Gambling appears to have criminogenic capacity, but here too, conclusions must be cautious as the causal direction between criminal behavior and gambling goes in both directions.

INEQUALITY EFFECTS

Gambling has equality-reducing redistributive effects. High-income groups spend more than middle or low-income earners [30], but relative to their income, poor gamblers contribute disproportionally to aggregate losses. Gambling transfers wealth from gamblers to the operating companies, states, and servants of the good causes. Economic analysts often describe gambling as regressive taxation [31, 32]. Young gamblers experience more problems than average players relative to their spending [33]. Ethnic minorities in many societies have a disproportionately high prevalence of problem gambling relative to their participation, probably reflecting underlying risk factors [34].

Gambling problems co-occur with poverty and debt. Some studies suggest that gambling is a cause of indebtedness [35, 36], and debt may also serve as a motivator to continue playing [37]. The least advantaged gamblers experience financial stress, job insecurity, and other forms of deprivation that are further exacerbated by gambling [38–40]. Problem gamblers contribute a high proportion to the total gambling expenditure, ranging from 15% (USA) to 40% (Australia, Canada), and in some cases more than 60%. The highest proportion attributable to problem gamblers is spending on machines and the lowest is on lotteries. Heavy gamblers spend 30% to 35% of their net income on gambling [41].

Low income, debt, heavy substance use, mental health disorders and criminal behavior among heavy gamblers are all significant policy issues, although the causal direction is unclear in most cases. Gambling aggravates these vulnerabilities even if it is not their cause.

POLICY GOALS AND INTERVENTIONS

Available evidence is sufficient to conclude that the total volume of gambling needs to be considered in setting policy goals. Gambling participation follows the single distribution regularity, meaning that the number of heavy gamblers varies with the total volume of gambling [42, 43]. Moreover, participation is highly concentrated in a small number of heavy gamblers [44–46]. However, due to their high number, low-risk and moderate gamblers produce much of the harm occurring within a population [47–49]. General restrictions to reduce consumption at all levels of the distribution are therefore likely to reduce the total burden of harm in society.

Total gambling expenditure is nevertheless an imprecise policy target, as risk of harm varies by type of game. To account for the diversity of impacts that gambling has on societies and their populations, policy goals require consideration of the public interest in a broad societal frame, including not only the total balance of costs and benefits but also who are affected, who are the actors involved, and who are the beneficiaries from the activity [50].

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EFFECTS OF REGULATING AVAILABILITY AND PRICE

Conclusions from extant research on restrictions of general availability are limited by two factors. First, the available game selection includes products with highly variable risk-levels, affecting different population segments in different ways. Distance to a casino, the density of available gambling machines, or the number of points of sale can easily be measured, but also the types of games they offer must be accounted for. Another limitation is that policies in the past 30 years have mainly changed in a more liberal direction, including de-regulation and privatization, and research on shifts to greater restriction is therefore scarce and recent.

Effects of availability have been easiest to measure when new casinos have been established. Casino licenses are commonly granted to attract tourists to the area, but studies show that the local population has been affected most [51]. Growth in local problem gambling prevalence has been found in Canada [52–54] and Sweden [55] but only partially in Switzerland [56], and only in the case of one of four new casinos in Canada [57]. Casino openings after the Indian Gaming Regulatory Act of 1988 in the USA were accompanied by increases in bankruptcies, crime, and suicides [58, 59]. Other studies have shown that living near a casino is associated with problem gambling and crime [60, 61]. Some countries (Turkey 1998; Russia 2006; Ukraine 2009) have abolished almost all casino operations, but no studies have evaluated the effects systematically.

Access to electronic gambling machines (EGMs) and video lottery terminals (VLTs) outside casinos is associated with participation and problem gambling in cross-sectional studies [62, 63]. However, such correlations may also result from other factors; for instance, the machines are often concentrated in economically deprived neighbourhoods [64, 65]. Studies on access restricted by governments suggest that limitations must be substantial to have effects. The Norwegian experience illustrates that substantial policy change produces substantial effects: the government banned all machines in 2007, replacing them later with far fewer and less harmful terminals with limited maximum losses. The restrictions led to a substantial net decrease in the total volume of gambling turnover and a decrease in problem gambling [66, 67].

Unauthorized online supply presents a problem for regulators as opening hours and access are beyond most governments' sway. Blocking websites of unlicensed operators is common but block lists require expensive maintenance. Controlling money transfers has had some success in the United States, with the US government's substantial control over credit cards and banking headquarters, but not fulfilled the expectations in other countries [68]. International legislation would be necessary for effective regulation of internet gambling, but it nevertheless is still lacking [69].

Raising the cost of practicing problematic behaviours is an efficient public health measure in many areas, and it has also been considered as a tool for containing gambling harms [70]. However, gamblers may not have a clear view of what the cost of participation is. Providers of gambling products intentionally obfuscate the price with illusionary winning chances, near wins, auditory and visual stimuli, and other such techniques.

Some countries mandate a minimum return percentage (maximum price) to maintain a standard integrity of games [71]. In contrast, some gambling providers, such as the French national lottery, justify their low return percentages, or in other words the high price of participation, as a harm reduction strategy [72]. Research remains inconclusive regarding whether high return levels encourage problem gambling or not [73, 74].

While price is difficult to apply to discourage consumers, governments can raise taxes on particular or all forms of gambling. To the extent they control the access to the market, they can make it less profitable to providers, thus reducing their interest in expanding the supply.

Another technique addressed to the general public is precautionary messaging. Campaigns are common, and often applied by operators themselves to encourage responsible behaviour, but these are seldom noticed, and positive effects have not been found. Messages addressed to high-risk groups to encourage help seeking and awareness programmes for children appear to work better [75].

SELECTIVE RESTRICTIONS

Whereas regulation of general availability and price are ambiguous and under-researched methods of prevention, evidence on selective restrictions to deter excessive play is more straightforward. These include limitations on who can play, pre-set ceilings on money and time that can be spent, and interventions into- and restrictions on high-risk behaviour.

Age limits are applied in most jurisdictions and studies suggest that they help to reduce problem gambling among youth if set sufficiently high (18 + years) [76, 77]. Restrictions on the working class or other selected groups have commonly been imposed to protect them; also local residents are often not allowed to gamble in casinos in their community.

Several kinds of interventions and exclusions aim to help individuals better control their gambling. Customers are frequently encouraged to set advance limits on the money and time they want to spend in a venue, on one company's games, or in total. These are commonly called

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responsible gambling tools by the industry, but they are seldom used by consumers.

Interventions into high-risk behaviour can be undertaken by staff of gambling providers, or they can occur in an automated way. A number of studies [78] on automated interventions support the conclusion that they can work if they are mandatory and personalized on the basis of behaviour tracking. Mandatory limits and exclusions can be applied online and also in land-based gambling if the players must authenticate themselves at machines or have identity checks at entry to venues. Loss limits should be sufficiently low to deter excessive spending [79].

The evidence supports the conclusion that selective restrictions can be efficient if enforced across the gambling offer available to populations. From the operators', beneficiaries', and public financing point of view the disadvantage is that when they do work, they almost inevitably reduce the overall gain. Often the solution is to adopt measures that tend to be the least effective. These include static warnings and voluntary measures based on self-assessment that mostly serve to improve the operators' image of corporate social responsibility (CSR) rather than to prevent problems.

GAME FEATURES AND ENVIRONMENT CHARACTERISTICS

Game and environment characteristics that increase game intensity and players' immersion are well known: near wins and frequent small wins, visual and auditory stimuli, and high progressive jackpots are common in gambling products. Speed, or event frequency, is a key factor that determines the risk-level of games. Electronic machines and many online games, including multiple betting, have very high event frequencies, with time gaps as short as two seconds between runs, or even completely continuous play. Instant scratch cards with electric dispensers and instant wins have similar characteristics. Game designers intentionally lead the players to believe that they win more than they actually do. Spurious control buttons and other interactive features encourage false beliefs about winning chances and illusions of controlling chance [80]. These characteristics can be regulated in the interest of preventing excessive play. Evaluation tools based on such parameters, such as ASTERIG or GamGard, can be used to measure the risk level of products [81, 82].

Research on gambling environments supports the conclusion that access to money, time awareness features such as lack of daylight, inducements, opportunities for smoking and drinking, and venue design, influence gambling intensity and immersion. Restrictions of these environmental facilitators can prevent gambling-related problems significantly.

The main difficulty for preventive regulation is political, and concerns gambling environments, selective restrictions of at-risk behaviour as well as general availability: successful efforts to keep down problematic gambling reduces the total volume of the trade, and consequently compromises the interests of those who depend on gambling returns.

TREATMENT AND EARLY INTERVENTION

Research on treatment for gambling disorder lags far behind research on alcohol or drug treatment and follow-up studies are still largely lacking. Cognitive behavioural therapy has been studied the most and has generally been supported. Single-session and other brief treatments may be as effective as more intensive evaluations [83, 84].

The mutual-help organization Gamblers Anonymous, and the use of medications, also have roles to play. In many parts of the world treatment for gambling problems is sparse or non-existent, and even in better resourced countries treatment availability is patchy and engagement in treatment is low, possibly because of the secrecy and stigma associated with gambling problems. Gambling treatment services need to be well integrated with other resources which focus on mental and physical health, domestic abuse and other family problems, poverty, and debt.

In view of widespread harm to others from gambling, help for family members affected by their relatives' excessive gambling should be a paramount feature. Considered in the wider policy context, treatment should never be expected to eliminate a nation's gambling problem. However, combined with other policy measures, a system which provides a variety of ways in which people can obtain appropriate help, advice or an opportunity to discuss their concerns regarding their own or another's gambling, should make a contribution to reducing gambling-related mental health disorders, crime, and damages to family life.

CONCLUSION: GAMBLING POLICY AND THE PUBLIC INTEREST

The evidence presented in the book *Setting Limits* leads to the conclusion that harm from gambling can be prevented and reduced by public policy, and that effective techniques to achieve this are well known. Gambling affects society far beyond individual problem gamblers themselves. Unfortunately, the revenue that gambling generates to support public budgets, welfare programs, health services, and social activities is often given higher priority than evidence-based efforts to contain the adverse effects.

Two fundamental truths must be recognized to attain a balance between these competing considerations. First, a very small part of the population, and of those who gamble, account for a very large share of the total spending. Second,

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problem gambling co-occurs frequently with mental and physical health problems, substance use, smoking, poverty, family problems, suicide risk, and criminal activity. The direction of causality cannot always be determined, but collateral damage should be considered in regulating the industry and in providing help to those who suffer from their own or other persons' gambling. The redistribution of wealth, concentration of the cost on a very small fragment of the population, and reinforcement of other vulnerabilities make gambling policy an issue of distributive justice.

The question is still open whether restrictions should target the general population or high-risk consumption selectively. Availability controls, price regulation, marketing restrictions and general warning messages belong to the former. If effective, they would affect moderate as well as heavy users.

The evidence leads us to conclude that availability of high-risk gambling to the general public is a relevant target for preventive restrictions. Price regulation to discourage gamblers is an ambiguous instrument, but taxes and levies are a potentially practical lever if applied to the entire game offer in a region or locality. Marketing restrictions have a role to play, but general messaging about risks is most likely not effective.

Effective selective restrictions of high-risk gambling include age limits, mandatory pre-commitments, loss limits and exclusions. Characteristics of gambling products and environments can also be effectively regulated to avoid harm. Given the high proportion of total losses attributable to a small number of heavy consumers, limits on their spending will inevitably reduce the total volume of and revenue from the activity.

Another open question to consider is to what extent selective restrictions can direct consumers to the least risky products. Shifting demand back to slow games with low return percentages (of winnings paid out to gamblers) has the potential to reduce gambling harm while supporting public revenue levels, but no research is yet available on this matter.

Most governments attempt to use both general and selective regulations. Whatever their mix, the growing online market is a challenge. In the gambling transaction, no physical commodities cross borders where they can be checked, and no trade agreements and supervisory international bodies exist. The World Health Organization has included gambling as a public health concern in its agenda since 2019, but there is additionally a need for international regulation of cross-border trade. National governments have an interest to protect their markets against unauthorized online competition, but the necessary blocking techniques are likely to violate trade agreements, are expensive, and may interfere with national policies on freedom of communication.

Policy experiences and impact research evidence come from a period when governments have tended to legalize the trade with openness toward more intensive gambling formats with higher risks. As the harms from this become apparent, efforts to cut back gambling availability and harm are currently increasing, and new evidence is accumulating on effective methods to do so. If successful, they will involve losses to operators, states, and other beneficiaries. The main response of governments to the increasing harm has been to concentrate research and attention disproportionately on problem gambling individuals – to send an ambulance to the bottom of the cliff rather than build a fence at the top. From a public health and pubic interest perspective, this approach is not adequate. The public interest requires governments to account for who collect the benefits, and who bear the cost and pain. In many countries the 'deck is stacked' in favor of the gambling industry and the governments that enable it [85, 86]. To correct this imbalance, there is a need to shift the policy perspective to effective, evidence-informed ways of setting limits.

Declaration of interests

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Author contributions

Pekka Sulkunen: Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualization. **Thomas F. Babor:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualization. **Jenny Cisneros Örnberg:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software;

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supervision; validation; visualization. **Michael Egerer:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualization. **Matilda Hellman:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualization. **Charles Livingstone:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualization.

References

1. Sulkunen P. The public interest approach to gambling policy and research. In: Egerer M., Marionneau V., Nikkinen J., editors *Gambling Policies in European Welfare States* Basingstoke, UK: Palgrave Macmillan; 2018, pp. 275–96.
2. Babor T. F., Caetano R., Casswell S., Edwards G., Giesbrecht N., Graham K., *et al. Alcohol: No Ordinary Commodity: Research and Public Policy, 2nd edn. Oxford: Oxford University Press; 2010.*
3. Babor T. F., Caulkins J., Fischer B., Foxcroft D., Medina-Mora M. E., Obot I., *et al.* Drug policy and the public good: a summary of the second edition. *Addiction* 2019; **114**: 1941–50.
4. Johansson A., Grant J. E., Kim S. W., Odlaug B. L., Götestam K. G. Risk factors for problematic gambling: a critical literature review. *J Gambl Stud* 2009; **25**: 67–92.
5. Lorains F. K., Cowlishaw S., Thomas S. A. Prevalence of comorbid disorders in problem and pathological gambling: systematic review and meta-analysis of population surveys. *Addiction* 2011; **106**: 490–8.
6. Abbott M. W., Williams M. M., Volberg R. A. A prospective study of problem and regular nonproblem gamblers living in the community. *Subst Use Misuse* 2004; **39**: 855–84.
7. Karlsson A., Håkansson A. Gambling disorder, increased mortality, suicidality, and associated comorbidity: a longitudinal nationwide register study. *J Behav Addict* 2018; **7**: 1091–9.
8. Williams R. J., Volberg R. A., Stevens R. M. G. The population prevalence of problem gambling: methodological influences, standardized rates, jurisdictional differences, and worldwide trends. Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long Term Care; 2012. Available at: https://opus.uleth.ca/bitstream/handle/10133/3068/2012-PREVALENCE-OPGRC%20(2).pdf (accessed 7 June 2020).
9. Bühringer G., Braun B., Kräplin A., Neumann M., Sleczka P. Gambling: two sides of the same coin. AR Policy Brief 2; 2013. Available at: http://euspr.org/wp-content/uploads/2013/07/AR_PolicyPaper-2-Gambling_July-2013.pdf (accessed 18 April 2019).
10. Raylu N., Oei T. Pathological gambling: a comprehensive review. *Clin Psychol Rev* 2002; **22**: 1009–61.
11. Slutske W. S., Jackson K., Sher K. J. The natural history of problem gambling from age 18 to 29. *J Abnorm Psychol* 2003; **112**: 263–74.
12. Cassidy R., Loussouarn C., Pisac A. Fair Game: Producing Gambling Research. London: The Goldsmiths Report; 2013. Available at: https://www.gold.ac.uk/media/documents-by-section/departments/anthropology/Fair-Game-Web-Final.pdf (accessed 8 May 2020)
13. Goodwin B. C., Browne M., Rockloff M., Rose J. A typical problem gambler affects six others. *International Gambling Studies* 2017; **17**: 276–89.
14. Kalischuck R. G., Nowatzki K. C., Klein K., Solowoniuk J. Problem gambling and its impact on families: a literature review. *International Gambling Studies* 2006; **6**: 31–59.
15. Salonen A., Castrén S., Alho H., Lahti T. Concerned significant others of people with gambling problems in Finland: a cross-sectional population study. *BMC Public Health* 2014; **14**: 398–416.
16. Wenzel H. G., Øren A., Bakken I. J. Gambling problems in the family – a stratified probability sample study of prevalence and reported consequences. *BMC Public Health* 2008; **8**: 412.
17. Dowling N., Rodda S. N., Lubman D. I., Jackson A. C. The impacts of problem gambling on concerned significant others accessing web-based couselling. *Addict Behav* 2014; **39**: 1253–7.
18. Dannon P. N., Lowengrub K., Aizer A., Kotler M. Pathological gambling: comorbid psychiatric diagnoses in patients and their families. *Isr J Psychiatry Relat Sci* 2006; **43**: 88–92.
19. Carpenter K. Match-fixing – the biggest threat to sport in the 21st century? *Int Sports Law Rev* 2012; **2**: 13–24.
20. Banks J., Waught D. A taxonomy of gambling-related crime. *Int Gambl Stud* 2019; **19**: 339–57.
21. Ferentzy P., Turner N. Gambling and organized crime: a review of the literature. *J Gambl Issues* 2009; **23**: 111–55.
22. Walker D., Calcagno P. Casinos and political corruption in the United States: a granger causality analysis. *Appl Econ* 2013; **43**: 4781–95.
23. Dowling N., Suomi A., Jackson A., Lavis T., Patford J., Cockman S., *et al.* Problem gambling and intimate partner violence. A systematic review and meta-analysis. *Trauma Violence Abuse* 2016; **17**: 43–61.
24. Markham F., Doran B., Young M. The relationship between electronic gaming machine accessibility and police-recorded domestic violence: a spatio-temporal analysis of 654 postcodes in Victoria, Australia, 2005–2014. *Soc Sci Med* 2016; **162**: 106–14.
25. Meyer G., Stadler M. Criminal behavior associated with pathological gambling. *J Gambl Stud* 1999; **15**: 29–43.
26. Laursen B., Plauborg R., Ekholm O., Larsen C. V. L., Juel K. Problem gambling associated with violent and criminal behavior: a Danish population-based survey and register study. *J Gambl Stud* 2016; **36**: 25–34.
27. Williams R. J., Royston J., Hagen B. F. Gambling and problem gambling within forensic populations a review of the literature. *Crim Justice Behav* 2005; **32**: 665–89.
28. Turner N., Preston D., Saunders C., McAvoy S., Jain U. The relationship of problem gambling to criminal behavior in a sample of Canadian male federal offenders. *J Gambl Stud* 2009; **25**: 153–69.
29. Grun L., McKeigue P. Prevalence of excessive gambling before and after introduction of a national lottery in the United Kingdom: another example of the single distribution theory. *Addiction* 2000; **95**: 959–66.
30. Williams R. J., Rehm J., Stevens R.M.G. The Social and Economic Impacts of Gambling. Final Report to the Canadian Interprovincial Consortium for Gambling Research; 2011. Available at: http://hdl.handle.net/10133/1286 (accessed 12 June 2020).

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31. Calado F., Griffiths M. D. Problem gambling worldwide: an update and systematic review of empirical research (2000–2015). *J Behav Addict* 2016; **5**: 592–613.
32. Beckert J., Lutter M. Why the poor play the lottery: sociological approaches to explaining class-based lottery play. *Soc Forces* 2013; **47**: 1152–70.
33. Schisel B. Betting against youth: the effects of socioeconomic marginality on gambling among Young people. *Youth Soc* 2001; **32**: 473–91.
34. Okuda M., Liu W., Cisewski J. A., Segura L., Storr C. L., Martins S. S. Gambling disorder and minority populations: prevalence and risk factors. *Curr Addict Rep* 2016; **3**: 280–92.
35. Brown S., Dickerson A., McHardy J., Taylor K. Gambling and credit: an individual and household level analysis for the UK. *Applied Economics* 2012; **44**: 4639–50.
36. Downs C., Woolrych R. *Gambling and Debt Pathfinder Study*. Manchester, UK: Research Institute for health and Social Change; 2009. Available at: http://usir.salford.ac.uk/id/eprint/2335/1/Gambling_and_Debt_Final_Report_PDF.pdf (accessed 7 June 2020).
37. Karter L. *Women and Problem Gambling. Therapeutic Insights Into Understanding Addiction and Treatment*. London: Routledge; 2013.
38. Rocheleau G. C., Dennison C. R., Finkeldey J. G., Reiber M. F. Social class differences in the relationships between problem gambling and deviant behavior. *Crim Justice Stud* 20201–20.
39. Chun J., Cho S., Chung I. J., Kim S. Economic and psychosocial impact of problem gambling in South Korea. *Asian J Gambl Issues Public Health* 2011; **2**: 29–38.
40. Tu D., Gray R. J., Walton D. K. Household experience of gambling-related harm by socio-economic deprivation in New Zealand: increases in inequality between 2008 and 2012. *Int Gambl Stud* 2014; **14**: 330–44.
41. Fiedler I., Kairouz S., Costes J., Weißmüller K. S. Gambling spending and its concentration on problem gamblers. *J Bus Res* 2019; **98**: 82–91.
42. Govoni R. J. Gambling behavior and the distribution of alcohol consumption model. Electronic theses and dissertations: Paper 2186. Ontario, Canada: University of Windsor; 2000.
43. Lund I. The population mean and the proportion of frequent gamblers: is the theory of total consumption valid for gambling? *J Gambl Stud* 2008; **24**: 247–56.
44. Hansen M., Rossow I. Adolescent gambling and problem gambling: does the total consumption model apply? *J Gambl Stud* 2008; **24**: 135–49.
45. Hansen M., Rossow I. M. Does a reduction in the overall amount of gambling imply a reduction at all levels of gambling? *Addict Res Theory* 2012; **20**: 145–52.
46. Chipman M., Govoni R., Roerecke M. The Distribution of Consumption Model: an Evaluation of its Applicability to Gambling Behaviour. Guelph, Ontario: Ontario Problem Gambling Research Centre; 2006. Available at: https://www.greo.ca/Modules/EvidenceCentre/files/ResSum_Chipman%20et%20al(2006)The_distribution_of_consumption_model.pdf (accessed 7 June 2020).
47. Raisamo S., Mäkelä P., Salonen A., Lintonen T. The extent and distribution of gambling harm in Finland as assessed by the problem gambling severity index. *Eur J Public Health* 2015; **25**: 716–22.
48. Rossow I. The total consumption model applied to gambling: empirical validity and implications for gambling policy. *Nord Stud Alcohol Drugs* 2019; **36**: 66–76.
49. Browne M., Rawat V., Greer N., Langham E., Rockloff M., Hanley C. What is the harm? Applying a public health methodology to measure the impact of gambling problems and harm on quality of life. *J Gambl Issues* 2017; **36**: 28–50.
50. Sen A. *The Idea of Justice*. Cambridge, MA: Harvard University Press; 2010.
51. Tong H. H. Y., Chim D. The relationship between casino proximity and problem gambling. *Asian J Gambl Issues Public Health* 2013; **3**: 2.
52. Govoni R., Frisch G. R., Rupcich N., Getty H. First year impacts of casino gambling in a community. *J Gambl Stud* 1998; **14**: 347–58.
53. Room R., Turner N., Ialomiteanu A. Community effects of the opening of the Niagara casino. *Addiction* 1999; **94**: 1449–66.
54. Jacques C., Ladouceur R. A prospective study of the impact of opening a casino on gambling behaviours: 2- and 4-year follow-ups. *Can J Psychiatry* 2006; **51**: 764–73.
55. Westfelt L. Statliga kasinon i Sundsvall och Malmö: Forväntningar, erfarenheter, attityder, spelande och spelproblem fore etablingeringen samt ett år och tre år efter [State casinos in Sundsvall and Malmö: expectations, experiences, attitudes to gambling and problem gambling before the establishment and one year and three years after]. Research report No. 3. Stockholm: SoRAD, Stockholm University; 2006.
56. Bondolfi G., Jermann F., Ferrero F., Zullino D., Osiek C. H. Prevalence of pathological gambling in Switzerland after the opening of casinos and the introduction of new preventive legislation. *Acta Psychiatr Scand* 2008; **117**: 236–9.
57. Mangham C., Carney G., Burnett S., Williams R. Socioeconomic Impacts of New Gaming Venues in Four British Columbia Lower Mainland Communities. Final report prepared for gaming policy and enforcement branch Ministry of Public Safety and solicitor general government of British Columbia. Victoria, BC: Blue Thorn Research and Analysis Group; 2007.
58. Evans W., Topoleski J. The social and economic impact of native American casinos. Cambridge, MA: National Bureau of Economic Research (NBER) Working Paper 9198; 2002.
59. Grinols E., Mustard D. Casinos, crime and community costs. *Rev Econ Stat* 2006; **88**: 28–45.
60. Welte J. W., Barnes G. M., Tidwell M. C. O., Hoffman J. H., Wieczorek W. F. Gambling and problem gambling in the United States: changes between 1999 and 2013. *J Gambl Stud* 2015; **31**: 695–715.
61. Gerstein D. R., Volberg R. A., Toce M. T., Harwood H., Palmer A., Johnson R., *et al. Gambling Impact and Behavior Study: Report to the National Gambling Impact Study Commission*. Chicago, IL: National Opinion Research Center at the University of Chicago; 1999.
62. Vasiliadis S., Jackson A., Christenson D., Francis K. Physical accessibility of gaming opportunities and its relationship to gaming involvement and problem gambling: a systematic review. *J Gambl Issues* 2013; **28**: 1–46.
63. Robitaille É., Herjean P. An analysis of the accessibility of video lottery terminals: the case of Montréal. *Int J Health Geogr* 2008; **7**: 2.
64. Raisamo S., Toikka A., Selin J., Heiskanen M. The density of electronic gambling machines and area-level socioeconomic status in Finland: a country with a legal monopoly on gambling and a decentralised system of EGMs. *BMC Public Health* 2019; **19**: 1–7.

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65. Wardle H., Keily R., Astbury G., Reith G. Risky places? Mapping gambling machine density and socio-economic deprivation. *J Gambl Stud* 2014; **30**: 201–12.
66. Rossow I., Hansen M. Gambling and gambling policy in Norway—an exceptional case. *Addiction* 2016; **111**: 593–8.
67. Engebø J., Gyllstrøm F. Regulatory changes and finally a ban on existing slot machines in Norway: what's the impact on the market and problem gambling? Presented at the 2008 International Gambling Conference, Auckland, New Zealand; 2008.
68. Williams, R. J., West, B. L., Simpson, R. I. Prevention of problem gambling: a comprehensive review of the evidence and identified best practices. Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long Term Care; 2012. Available at: https://opus.uleth.ca/bitstream/handle/10133/3121/2012-PREVENTION-OPGRC.pdf (accessed 7 June 2020).
69. Laffey D., Della Sala V., Laffey K. Patriot games: the regulation of online gambling in the European Union. *J Eur Publ Policy* 2016; **23**: 1425–41.
70. Livingstone C., Rintoul A., de Lacy-Vawdon C., Borland R., Dietze P., Jenkinson R., *et al*. *Identifying effective policy interventions to prevent gambling-related harm*. Melbourne, VIC: Victorian Responsible Gambling Foundation; 2019.
71. Harrigan K., MacLaren V. The House Rules: Gaming Regulations and Their Effects on Gambling and Problem Gambling Across Canada. Waterloo, ON: University of Waterloo Research Report for the Ontario Problem Gambling Research Centre; 2014.
72. Costes J.-M., Eroukmanoff V., Richard J.-B., Tovar M.-L. Les jeux d'argent et de hasard en France en 2014 (Gambling in France in 2014). *Notes de l'Observatoire des jeux* 2015; **6**: 1–9.
73. Parke J., Parke A. Does size really matter? A review of the role of stake and prize levels in relation to gambling-related harm. *J Gambl Bus Econ* 2013; **7**: 77–110.
74. Dixon M. J., Fugelsang J. A., MacLaren V. V., Harrigan K. A. Gamblers can discriminate 'tight' from 'loose' electronic gambling machines. *Int Gambl Stud* 2013; **13**: 98–111.
75. Auer M., Malisching D., Griffiths M. Is 'pop-up' messaging in online slot machine gambling effective as a responsible gambling strategy? *J Gambl Issues* 2014; **29**: 1–10.
76. Raisamo S., Warpenius K., Rimpelä A. Changes in minors' gambling on slot machines in Finland after the raising of the minimum legal gambling age from 15 to 18 years: a repeated cross-sectional study. *Nord Stud Alcohol Drugs* 2015; **32**: 579–90.
77. Calado F., Alexandre J., Griffiths M. D. Prevalence of adolescent problem gambling. A systematic review of recent research. *J Gambl Stud* 2016; **33**: 397–424.
78. Ladouceur R., Blaszczynski A., Lalande D. Pre-commitment in gambling: a review of the empirical evidence. *Int Gambl Stud* 2012; **12**: 215–30.
79. Leino T., Torsheim T., Blaszczynski A., Griffiths M., Mentzoni R., Pallesen S., *et al*. The relationship between structural game characteristics and gambling behavior: a population-level study. *J Gambl Stud* 2015; **31**: 1297–315.
80. Schüll N. *Addiction by Design. Machine Gambling in Las Vegas*. Princeton, NJ: Princeton University Press; 2012.
81. Hörnle J., Littler A., Tyson G., Padumadasa E., Schmidt-Kessen M., Ibosiola D. *Evaluation of Regulatory Tools for Enforcing Online Gambling Rules and Channelling Demand towards Controlled Offers*. Brussels: European Commission; 2019.
82. Meyer G., Häfeli J., Mörsen C., Fiebig M. Die Einschätzung des Gefeährdungspotenzials von Glücksspielen [The Assessment of the Hazard potential of Gambling]. *Sucht* 2010; **56**: 405–14.
83. Petry N. M. *Pathological Gambling: Etiology, Comorbidity, and Treatment*. Washington, DC: American Psychological Association; 2005.
84. Cowlishaw S., Merkouris S., Dowling N., Anderson C., Jackson A., Thomas S. Psychological therapies for pathological and problem gambling. *Cochrane Database Syst Rev* 2012; **11**: CD008937.
85. Orford J. *The Gambling Establishment: Challenging the Power of the Modern Gambling Industry and Its Allies*. Abingdon, UK: Routledge; 2020.
86. Cassidy R. *Vicious Games. Gambling and Capitalism*. London: Pluto Press; 2020.

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