

IDENTIFYING RESEARCH PRIORITIES ON GAMBLING- RELATED HARMS

A RAPID EVIDENCE ASSESSMENT FOR
ACTION AGAINST GAMBLING HARMS

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Executive Summary

Gambling in the UK is a very widespread activity, with 47 per cent of adults in the 2019 Gambling Commission Survey reporting that they had gambled at some point in the last four weeks. Although gambling is by no means a new phenomenon, the digital age has changed the ways that people can gamble, and the UK Government has launched a review of the Gambling Act 2005 to ensure it reflects these transformations.

Against this backdrop, the Policy Institute at King's College London was commissioned by Action Against Gambling Harms (AGH) to understand better the available evidence around gambling harms. Our objective was to ascertain where there were gaps in the research base and to make recommendations about which avenues of research would be both feasible and valuable. As requested by AGH, we focused our attention on four key topics:

1 | Financial harms of gambling and affordability of gambling more generally (including costs to people and public services)

2 | Gambling on Sport

3 | Gambling by Children

4 | Gambling by Women

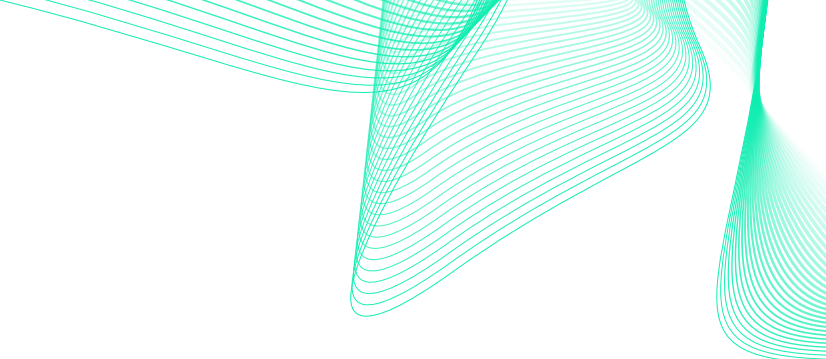
Within each of these areas, we focused our efforts on a) harms, b) characteristics of those experiencing harms, c) behaviours associated with harm and d) interventions to mitigate harm. To achieve this in the limited timeframe allowed by the announcement of the Government's Review, we conducted a rapid evidence assessment to identify where the research gaps were; a fuller description of our method can be found in the introduction below.

Our headline finding is that there is a real lack of empirical research on gambling harms in the UK. In particular, we found significant evidence gaps around the harms that gambling in general, and problem gambling as a specific subcategory of overall gambling, might cause. We also note that, if this gap is to be filled with robust empirical research, then more funding needs to be channelled to gambling-related research through independent sources.



There is a real lack of empirical research on gambling harms in the UK.”

Our review identified a series of specific research gaps that cut across the four areas on which our study focused. First, the UK appears to lag behind other countries in empirical research into gambling harms. In comparison with other countries such as Australia, Canada and the US, we found relatively little research on gambling harms in the UK context. This was true across the four areas that



we explored and appears to be a characteristic of the wider evidence base. This is important as there are limits to the extent to which overseas findings are translatable to the UK context, given the potential differences in socio-cultural factors and the gambling ecology (for example, legal gambling age, availability of gambling products and venues etc.)

Second, we found a lack of conceptual literature on what constitutes a ‘gambling-related harm’ and a related lack of scholarship on how to measure such a harm. Although not a targeted part of the review per se, we were struck by the limited body of work defining harms and how to measure them.

Third, although we found evidence to suggest a strong correlation between poverty and gambling, we found no research which established the direction of causation between the two, nor the conditions under which poverty causes gambling and gambling causes poverty.

Fourth, we found a very significant gap on the costs of gambling to the public purse in the UK context. At best we found some estimates of the extra fiscal cost of problem gamblers in a few very specific settings, but we found no study in the UK context that systematically mapped out the costs of gambling on public services, despite the fact that studies of this kind have been conducted in other countries (eg Australia and New Zealand). Innovative methodologies will be needed to establish these costs, including public health and ‘burden of disease’ style approaches.

Fifth, we found a relative lack of research that charted the effects of gambling over a long timeframe to fully understand the whole ‘journey’ of gamblers, and the wider effects that gambling causes over a longer duration.

Sixth, we identified some methodological limitations associated with the existing evidence base. In particular, there is a heavy reliance on self-report data, which is at risk of a range of biases, rather than the use of objective measures of gambling-related harms. Second, much of the data used is of a cross-sectional nature, precluding conclusions about the direction of the relationship between gambling behaviours and other outcomes. The analysis of data from prospective longitudinal studies, which follow the same participants over time, would help to address this gap in the evidence, though we note that these studies can be costly and difficult to establish. A more practical and feasible approach may be to ensure that existing longitudinal or cohort studies include questions on gambling.

Seventh, the evidence we identified in this review points to differences in motivations and characteristics between subgroups of problem gamblers, as well as the harms that they experience. Much more needs to be understood about these differences and how to effectively tailor public health initiatives and harm reduction interventions to the meet the specific needs of these populations.

Finally, we note that although our review was targeted at specific research areas, within these, we found little mention on the effects that Covid-19 might have on gambling behaviours and the harms of gambling, both in the short-term and in the longer-term.

9,240
papers found

120
papers reviewed

Affordability

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We found a small body of work that analyses the correlation between poverty and problem gambling; however, this work does not establish the direction of causality, nor the conditions under which gambling causes poverty, and vice versa.

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We found several in-depth studies of the financial harms that problem gambling can produce for gamblers and their families.

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We found some evidence around the costs of gambling, largely in the form of public health approaches deploying a burden of disease approach; all of this was conducted outside the UK context.

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We only found two studies which estimated the economic costs of problem gambling on public services. Only one of these was in the UK context and it was based on (by the authors' own admission) estimates of the extra fiscal cost of problem gamblers in a small number of areas in which they come into contact with the state.

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We found almost no evidence on the characteristics of gamblers in relation to financial harms nor on the interventions specifically targeting affordability and financial harms.

Children

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We found a large body of literature that related to the question of the harms associated with gambling among children and adolescents. This research highlights robust associations between gambling in those groups and a wide range of negative outcomes, including substance use, delinquent behaviour (the term used widely in that literature), mental ill health and low academic performance.

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The cross-sectional nature of many of these studies mean that they are not able to say whether these observed relationships are causal. The few studies we identified that have used longitudinal data tend to point to a relationship between gambling and the harm in question, with each contributing to the other.

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We also found several studies evaluating interventions to prevent gambling or gambling-related harms among children and young people, largely conducted in secondary school contexts. These studies generally found that interventions could improve knowledge about gambling and attitudes towards it, but the evidence on their impact on gambling behaviour is less extensive and more mixed.

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Many of the knowledge gaps in the literature seem to relate to the lack of longitudinal data analysis, which could help to show the direction of the relationship between youth gambling and other negative outcomes.

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There also appears to be a shortage of evidence on gambling harms among children, and interventions to mitigate them, gathered in a UK context. This may suggest a need for more studies conducted among UK children and young people.

Women

Relatively little evidence specifically focused on the characteristics of women problem gamblers, the harms that they experience, and effective harm reduction interventions specifically targeted towards women was identified in this review. This reflects a historic male bias in the literature on gambling harms.

However, the prevalence of female gambling generally, and female problem gambling specifically is increasing, as the ‘feminisation’ of gambling products and venues by the industry continues.

Emerging evidence suggests that the profile of women who have problems gambling and interventions that are effective in reducing the harm they experience are markedly different to that of men. Therefore, research findings are not generalisable across genders and the development of effective interventions for women should not be solely informed by evidence on men with problem gambling.

There is currently a lack of research on gambling by women in the UK context. Promising avenues for future research in this space include differences in gambling behaviours and experiences of harm by age group; problem gambling in immigrant and minority ethnic communities; longitudinal studies which may investigate how gambling behaviours may change over time and the effectiveness of harm reductions in the longer term; and the interactions between mental ill health and harmful gambling behaviour.

Sports

Sports betting is a rapidly growing and innovating area of gambling, with close links to online modes of gambling and new gambling opportunities, such as daily fantasy sports (DFS). The patchy evidence base we identified suggests that research may be struggling to keep pace.

Much of the evidence is on the relationship between sports gambling and problem gambling among sports bettors. This evidence tends to point to a positive association between betting on sports, including online and via fantasy sports or DFS, and problematic gambling. The evidence on wider harms associated with sports betting appears to be much scarcer.

Qualitative studies point to the potentially problematic features of online sports gambling, such as instant depositing, cash out features and in-play betting, and gambling via mobile apps. This research suggests that these features can increase gambling frequency and problem gambling behaviour, and increase the risk of harms.

We also reviewed evidence on the harms associated with the advertising and marketing of sports betting among both adults and children. This suggests that the promotion of sports betting could be particularly harmful for existing problem gamblers, and can raise awareness of gambling among children.

There appears to be a need for more research into the harms associated with sports gambling overall. This includes research among more diverse populations and into emerging modes of sports gambling, such as DFS. We also did not identify any studies exploring the impact of interventions to prevent or mitigate the harms of sports gambling, which may point to an additional area for future research.

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Introduction

47%

In 2019, 47% of UK adults reported gambling in the past month

£14.2bn

gross gambling yield in the UK between April 2019 and March 2020

Gambling in the UK is a widespread activity. According to the annual Gambling Commission survey in 2019, 47 per cent of respondents (adults over the age of 16) had gambled in the previous four weeks. When those who gambled exclusively on the National Lottery were removed, 32 per cent of respondents had gambled in that period. This was a 5 per cent increase from 2015 (2016: 33 per cent; 2017: 31 per cent; 2018: 32 per cent; 2019: 32 per cent).

Clearly, not all of this is problem gambling (eg which causes harm to gamblers and those around them) which accounts for a small, but not insignificant proportion of overall gambling. Estimates of problem gambling vary, but according to the Health Survey, about 0.5 per cent of respondents were classified as problem gamblers; the Gambling Commission's regular survey similarly found 0.6 per cent of respondents were problem gamblers (Gambling Commission, 2019). These estimates are however most likely underestimates of the situation, as they are self-reported surveys.

These statistics suggest that, in the UK, gambling is a very visible and widespread activity. Indeed, a good deal of research has demonstrated how gambling is an increasingly normalised behaviour. It is also increasingly profitable, with the UK making a gross gambling yield of £14.2bn between April 2019 and Mar 2020 (Gambling Commission, 2020). But despite the fact that it is becoming more widespread, more accepted and more profitable, the harms that emanate from it remain complex and often hidden.

The Policy Institute at King's College London was commissioned by Action against Gambling Harms (AGH) to understand better the available evidence around gambling harms.¹ Our objective was to ascertain where there are gaps in the research base and to make recommendations about which avenues of research would be both feasible and valuable. As the existing evidence base on gambling harms is very broad and has multiple touchpoints across a range of disciplines (eg addictions, mental health, economics, health and social care policy and so on), we focused our attention on four key topics:

1 | Financial harms of gambling and affordability of gambling more generally (including costs to people and public services)

2 | Gambling on Sport

3 | Gambling by Children

4 | Gambling by Women

¹ Action against Gambling Harms is a start-up charity with initial funding from the Betting and Gaming Council. The major focus of the organisation in its early stages is to promote the need for further research so there is better understanding of both the harms that are being experienced as well as possible interventions that may pre-empt or mitigate these harms.

These areas were chosen in consultation with AGH and were designed to reflect areas of growing policy interest, with a view to being able to inform the recently announced Government Review of the Gambling Act 2005. Within each of these areas, we focused our efforts on a) harms, b) characteristics of those experiencing harms, c) behaviours associated with harm and d) interventions to mitigate harm.

To do this, we employed a rapid evidence assessment (REA) methodology. REAs provide an approach to reviewing an existing evidence base that seeks to meet needs for both rigour and speed (Thomas, Newman, and Oliver 2013). They draw on systematic review techniques and employ explicit and robust methods, but limit some aspects of the process to enable them to be produced more quickly (Government Social Research Service 2014). While they cannot promise to identify and review every relevant study, the intention is that the included studies are representative of the body of research evidence (Government Social Research Service 2014). REAs are particularly attractive for policy-focused research where findings are often required quickly to inform decision making (Thomas 2013).

A search strategy to return results relevant to our four areas of interest (children, women, sport and affordability) was designed working with a professional librarian. The search strings used to identify studies in each topic area are given in Appendix A. Consultation with project advisors indicated that relevant studies were likely to be found in the grey literature (ie in the policy literature and other non-peer reviewed sources) as well as in conventional peer-reviewed academic journals. In light of this, we conducted searches of the main grey literature database (OpenGrey) alongside searches of four major databases covering public health, social policy, addiction and psychology-related journals – Medline, PsycINFO, Web of Science, Scopus and CINAHL.

The results identified by the database searches were sifted for relevance by project researchers. Two sifts were employed – a first sift by title, and a second sift by title and abstract to obtain the final set of studies for inclusion in the review. The general inclusion and exclusion criteria employed are set out in Table 1. This was structured according to the PICOS framework, that specifies the Population, Interventions, Comparators, Outcomes and Study designs of interest. (Snape, D. *et al* (2016). A guide to our evidence review methods. *The What Works Centre for Wellbeing*). These criteria formed the basis of inclusion decisions in each topic area, with scope for additions or adaptations to ensure its relevance to the body of literature being reviewed.

TABLE 1: INCLUSION/EXCLUSION CRITERIA

Population	Include study populations in the UK or constituent nations/regions
	Include study populations in other countries relevant to the UK context (eg Europe, North America, Singapore and Australasia)
	Exclude studies conducted in other country contexts
	[Relevant restrictions based on age or gender of populations for women and children topic areas]
Intervention (or issue)²	Include studies investigating the harms resulting from gambling, or negative outcomes associated with gambling
	Include studies evaluating interventions to prevent or reduce gambling harms
	Exclude studies that do not look at gambling among the population of interest
Comparators	Include studies using any comparator, or without a comparator
Outcomes	Include studies reporting on harms resulting from gambling activity
	Include studies reporting on individual/group characteristics of those experiencing gambling harms
	Include studies reporting on the relationship between gambling behaviours and harms experienced
	Include studies reporting on the effectiveness of interventions to prevent gambling or reduce gambling harms
	Exclude studies that only report on gambling prevalence, the predictors of gambling behaviour or attitudes to/perceptions of gambling
Study design	Include primary empirical studies using either quantitative or qualitative methodologies (with a particular interest in cohort and longitudinal studies)
	Include review studies, including systematic reviews, meta-analyses and scoping/rapid reviews which have been systematically conducted
	Exclude non-empirical studies, opinion and comment pieces and literature reviews without a clear method
Other criteria	Only include studies published since 2010, published in the English language and for which the full text is available online.

The search and sifting phases of the review for each topic area are set out in Table 2. This also includes the additional records obtained via snowballing – hand searching the references cited by included papers to identify other relevant studies that were not picked up in the database searches. We also included references recommended by project advisors at this stage.

TABLE 2: LITERATURE REVIEW SEARCH AND SIFTING PROCESS

Stage	Children	Women	Sport	Affordability
Records identified through database searches	2720	2355	2488	1677
Records remaining after duplicates removed	1866	2006	1411	1072
Records included after sift 1	137	144	85	27
Records included after sift 2	49	15	27	9
Additional records obtained via snowballing	7	5	1	17
Records included in review	56	20	28	26

² Many of the studies relevant to this review were not intervention studies, so we broadened this category to cover the issue being researched.

Limitations

The approach we have followed here is not without its limitations. While a rapid evidence review is systematically conducted, the shortened timescale for its production means it is at an increased risk that the studies reviewed may not give an accurate representation of the full body of evidence relevant to a research question (Government Social Research Service 2014).

There are several routes through which bias could have been introduced to our review. Most obviously, we limited ourselves to published studies in English, therefore excluding unpublished studies and those published in other languages. Second, we were forced to limit ourselves to studies for which the full text is available online, due to the context of the coronavirus pandemic and associated restrictions, which limited access to library facilities. There is also the possibility that relevant studies were excluded in the sifting process, and that relevant results within included studies were missed during the literature review process, as (due to time limitations) each of these steps was conducted by just one researcher. In a systematic review, sifting and data extraction would typically be completed by two reviewers, to reduce the potential for error.

Finally, we were not able to complete a systematic quality assessment of included studies, which means we were not able to give more weight in our review to the findings of studies employing more rigorous designs or exclude those of low methodological quality entirely.

Affordability and Financial Harms of Gambling

Between April 2019 and March 2020, people in the UK gambled away £14.2bn (Gambling Commission 2020). For some, the losses will have been manageable; for others, these losses will have caused significant financial problems for themselves and for their families. The ‘win or lose’ nature of gambling means that, in terms of harms, it is often the immediate financial effects on the individual and their family that are the most visible and most palpable. But, as the financial harms of gambling radiate out beyond the player and their family into the community and wider society, so they become more hidden and, as we shall see, so the evidence we found in our review becomes more sparse.

In this strand of the review, we have consciously sought to look for evidence on the affordability of gambling not only to players, their families and wider relationships, but also to society as a whole, including the financial burdens of gambling on public services. From our search string (see Appendix A), we identified 1,072 articles on financial harm in our initial search; following the subsequent sifts on titles and abstracts, this fell to 9, to which we supplemented a further 17 articles based on snowballing. This is in line with the only other scoping review in this area, which found 27 articles on the links between gambling and poverty (Hahmann *et al* 2020).

Of the research we found, the majority looks at the financial harms of problem gambling to individuals and to their wider families; we found less on the financial harms caused by non-problem gamblers. We found some evidence around the costs of gambling, largely in the form of public health approaches deploying a burden of disease approach; we only found two studies which estimated the economic costs of problem gambling on public services. We found almost no evidence on the characteristics of gamblers in relation to financial harms; the same is true of interventions specifically targeting affordability and financial harms (though there are lots that seek to mitigate the wider harms of gambling, including financial ones).

Gambling harms

The vast majority of studies we found focus on the financial harms of gambling (particularly problem gambling) for players, affected others and for society more broadly. The evidence base falls essentially into three categories: first, the financial harms and effects of gambling on players themselves; second, the experiences and effects of financial harm on the families and wider relationships of problem gamblers; third, the wider social costs of gambling (including both problem and non-problem gambling).

Financial harms on players

There is good evidence for the financial harms of problem gambling. Data from GamCare’s national gambling helpline show that financial pressures are the most commonly experienced harm, with around 70 per cent of callers to the National Gambling Helpline mentioning some level of gambling debt and/or financial hardship, and 28 per cent reporting serious impacts of problem gambling (GamCare 2021). A study by Wardle *et al* (2014) of survey data from England and Scotland found that problem gamblers were three times more likely to report being in debt compared to non-gamblers (38 per cent and 12 per cent respectively), and that

34 per cent of problem gamblers reported having financial difficulties rated as more severe than 'slight', in comparison to 23 per cent of at-risk gamblers and 10 per cent of non-gamblers (Wardle *et al* 2014).

There are also several estimates for the financial harm of gambling to gamblers. In the Australian context, the 2010 Productivity Commission estimated that the average financial harm to gamblers was 1500 AUD (Commission 2010). The financial harm on problem gamblers was far greater. Data from the National Gambling Treatment Service (GamCare, Gordon Moody and the London Treatment Centre) estimated that just three in ten gamblers (29 per cent) had no debt due to gambling at the time of assessment, 26 per cent had debts up to £5,000, and 45 per cent had debts over £5,000 or were bankrupt or in an Individual Voluntary Arrangement (IVA) (National Gambling Treatment Service, 2019).

A recurring theme through the studies we looked at for this review was that problem gambling both causes and is caused by financial hardship. Although a common theme, we found few studies which robustly explore the different aspects of financial harms that gambling causes other than in rather generic terms, noting that problem gambling can lead to serious financial difficulties, such as falling into debt, borrowing (with or without permission) from family savings and from friends, criminality and bankruptcy.

One exception is a study by Muggleton *et al*, which analyses anonymised bank activity of 102,195 customers at the Lloyds Banking Group and showed that higher levels of gambling were associated with markers of financial hardship, such as using an unplanned bank overdraft, missing a credit card, loan or mortgage payment, taking a payday loan and being subject to debt collection by bailiffs. They were also correlated with smaller spends on insurance and mortgage repayments, smaller total savings and smaller pension contributions (Muggleton *et al* 2021).

Financial harms on affected others

In contrast to the evidence of financial harms on players, the research on the effects of problem gambling on families, friends and extended relationships that we found tended to be qualitative, with the intention to understand the nuances of the lived experiences of affected others, and how financial hardship has changed their lives. For instance, one study based on in-depth interviews with fifty Singaporeans with a family member who is a 'problem or pathological' gambler found that in 33 of the families studied, the financial debts ranged from tens of thousands to hundreds of thousands of dollars (Mathews and Volberg 2013). The same study also found that 13 families had to sell their homes, and that the financial hardships meant that children growing up in such circumstances faced at least some deprivation.

Another study of the perceptions of partners and ex-partners of 18 problem gamblers found that all were confronted with '[a] dire financial situation and the difficulties of coping with their partner's financial losses and gambling debts... [and many] spoke about not being aware of the financial consequences of their partner's gambling, until a financial or legal crisis emerged (Holdsworth *et al* 2013).

Other studies looked at the long-term psychological harms experienced by affected others from financial hardship as a consequence of problem gambling. For instance, one examined the use of generic community support services by family members and describes the significant psychological distress caused by financial harms, as well as the support needed by other family members in the form of loans and other financial support (Landon, Grayson, and Roberts 2018). Another study explored the differential effects of financial harms on gamblers and their spouses. This found that, while gamblers were more likely to report harms which centred on individual problems associated with lack of ability to spend or access money, spouses and affected others identified the psychological effects felt collectively by the household of late bill payments and financial hardship (Jeffrey *et al* 2019).

The social costs of gambling

Our search found few studies estimating the wider social costs of gambling or the costs on public services. Those that we did find largely took a public health approach to gambling and attempted to use Quality-Adjusted Life Years modelling to establish the relative harms that gambling causes. All studies of this type found that gambling causes very significant harm. One study of gambling in New Zealand estimated that gambling causes over twice the amount of harm as chronic conditions such as osteoarthritis (2.1x), diabetes (2.5x), and that of drug use disorders, bipolar affective disorder, eating disorders and schizophrenia combined ('Measuring the Burden of Gambling Harm in New Zealand' n.d.). Another study, based in Victoria, Australia, compared gambling with other health conditions and estimated that gambling problems are "a social issue on a similar order of magnitude to major depressive disorder and alcohol misuse and dependence" (Browne 2016).

One of the key elements of both these studies is that they attempt to estimate the costs of all gambling in one country, rather than looking at the costs of problem gambling specifically. The New Zealand study, for instance, calculates that less harm is produced by problem gamblers rather than those who are not problem gamblers simply because there are more low-risk gamblers than problem gamblers. They argue that "it is insufficient to concentrate simply on reducing the incidence of problem gambling. Rather, the focus should be on minimising gambling-related harm across the spectrum of problematic gambling behaviour" ('Measuring the Burden of Gambling Harm in New Zealand' n.d.). The Victoria study similarly found that aggregate harms to non-problem gamblers exceed those occurring to problem gamblers by about 6–1 (Browne 2016).

Other studies of the social costs of problem gambling that we found attempted to estimate the cost of problem-gamblers alone on a variety of public services. A study from Sweden estimates the societal costs of problem gambling amounted to 1.42 billion euros in 2018, corresponding to 0.30 per cent of the gross domestic product, more than twice the tax revenue from gambling that year (Hofmarcher *et al* 2020).

One of the very few studies in the UK context attempts to estimate a cost to government associated with individuals who are problem gamblers (Thorley, Sterling, and Huyhn 2016). This study uses prevalence surveys to estimate the number of problem gamblers in Great Britain, and then estimates the excess fiscal cost that problem gamblers create in what they identify as six specific interactions with the state:

- ♦ “health costs: primary care (mental health) services; secondary mental health services; and hospital inpatient services
- ♦ welfare and employment costs: JSA claimant costs and lost labour tax receipts
- ♦ housing costs: statutory homelessness applications
- ♦ criminal justice costs: incarcerations”

Based on these six interactions, the authors estimate that the excess fiscal costs incurred by individuals who are problem gamblers is between £260 million and £1.16 billion per year. They are very clear that this is an illustrative analysis that involves estimating the extra fiscal costs incurred by problem gamblers in comparison to otherwise similar members of the population. In recognising the limitations of their study, they also note that their study is the “first step along the journey to understanding the total cost to government of problem gambling in Great Britain, and the starting point for future estimates as more data is collected” (Thorley, Sterling, and Huyhn 2016).

Characteristics and contexts

In contrast to the literature on financial harms, we found less evidence around the characteristics of gamblers who experience financial harms. What we did find was a substantial body of literature on the relationship between socio-economic circumstances and problem gambling, providing a different angle on the relationship between gambling and financial hardship. One important limitation of this literature, however, is that it is not possible to identify the direction of causality between problem gambling and socio-economic circumstances. Put another way, it is not possible to establish whether poverty increases the likelihood of problem gambling or whether problem gambling increases the likelihood of poverty, or intensifies it.

That said, we found a number of studies that found correlations between problem gambling and socio-economic status. The scoping review conducted by Hahmann *et al* found that the quantitative evidence in their review of 27 papers suggested higher prevalence rates of gambling problems among those experiencing individual- and area-level poverty ((Hahmann *et al* 2020; see also Bramley, Norrie, and Manthorpe 2018). This is borne out by other studies. Using a spatial model of gambling vulnerability, Rintoul *et al* show that, in the Australian context, there is a clear correlation between the highest levels of loss from gambling on electronic gaming machine per individual and the highest levels of deprivation (Rintoul *et al* 2013). Similarly, Barnes *et al*, using a large representative sample of adults and young people, noted “a significant interaction among individual-level socioeconomic status, neighbourhood disadvantage, and problem gambling” (Barnes *et al* 2013).

Another strand of literature looked at other factors such as housing and employment. Throughout this strand, the research suggests gambling problems are higher among homeless populations. In their scoping review, Hahmann *et al* found that gambling problems were higher among homeless populations and were statistically associated with homelessness, with those experiencing gambling problems being homeless more often during their lifetimes (Hahmann *et al* 2020). They also found four studies in which unemployment was associated with gambling problems, as well as an

association between part-time employment and gambling problems, where those employed part-time relative to full-time were more likely to experience gambling problems (Hahmann *et al* 2020). Once again, it is not possible to say that gambling caused these outcomes, or the other way around. It is also possible that both share common risk factors.

Conclusion

Our rapid review of the literature and its gaps suggests that the available evidence on the financial harms of gambling is patchy. In some areas, there appears to be a good deal of empirical research: for instance, there is a small but robust body of work that analyses the correlation between poverty and problem gambling. Equally, we found several in-depth studies of the financial harms that problem gambling can produce for gamblers and their families although the long-term impacts of gambling-related financial problems on individuals and affected others remain largely under-explored.

By contrast, other areas have less empirical research and evidence. Perhaps the most notable amongst these was the absence of evidence we found on the costs of gambling on public services. As Thorley *et al* note, their study is based on a series of estimates and only encompasses gambling when it comes into contact with the state in six very specific ways and more detailed economic assessment should be a research priority going forwards. This point is supported by other assessments of the literature from other jurisdictions. For instance, the US National Research Council Committee on the Social and Economic Impact of Pathological Gambling notes that:

'Despite the recent improvements made in the estimation of the benefits and costs of gambling, this area of inquiry is still in its infancy. A very few studies have recently made large strides over the contributions of earlier studies, which generally focused only on the positive economic benefits or provided descriptions of the cost factors associated with pathological and problem gambling, but did not attempt to estimate the costs of gambling, much less the costs of pathological and problem gambling. Still, benefit-cost analysis of pathological and problem gambling remains undeveloped. (National Research Council (US) Committee on the Social and Economic Impact of Pathological Gambling 1999)

More broadly (and this is reflected in our other sections), we would note a relative lack of cost benefit analysis evidence in the UK context – we only found a handful of studies on the costs to public services of gambling in the UK. Research that can home in on the UK setting will be important for fully understanding what the financial harms of gambling are in the UK (as opposed to other settings) in the short and long-term and what interventions might successfully be deployed to mitigate them.

Gambling by Children

Surveys point to gambling being a relatively common activity among children and adolescents in the UK and globally. The most recent iteration of the Gambling Commission's *Young People and Gambling* survey, conducted in 2020, highlights that almost one in ten 11-16 year olds in England and Scotland (9 per cent)³ had spent their own money on gambling in the week preceding the survey, and over a third (37 per cent) had gambled in the preceding year (Gambling Commission 2020). The survey also reports that a small minority of adolescents (1.9 per cent) could be considered problem gamblers, and a further 2.7 per cent were judged to be 'at risk' gamblers.

Looking at the international evidence, Calado *et al* (2017) find that the past-year prevalence of adolescent problem gambling varied across countries from 0.2 per cent to 5.6 per cent, and note evidence that problem gambling may be more prevalent among youth than among adults. The prevalence of gambling, and gambling problems, among children and young people underlines the needs to investigate the harms experienced by young gamblers.

In this section, we report the findings of our review of the literature related to gambling harms among children. By children, we mean those under the age of 18 in the UK, which is the minimum legal age for gambling in Great Britain (Gambling Commission).⁴ The legal age differs in other jurisdictions, however. Readers should therefore bear in mind that the terminology 'children', 'youth', 'adolescents' and 'young people' therefore refers to slightly different age groups across studies conducted in different country contexts.

Our search of academic and grey literature databases (see Appendix A for details) returned 1866 results once duplicates had been removed. After our first sift, this was reduced to 137 papers. Following a more in-depth second sift, we were left with 49 studies. We added a further seven studies identified from the references of these included papers or recommended by project advisors, giving a total of 56 studies for review.

The literature that we identified can be divided into two distinct bodies. The first, and larger, body of literature focuses on the negative outcomes for young people that are associated with gambling. These studies tend not to use the language of 'harms' from gambling, probably because a harm implies that the outcome was caused by gambling, which is not something these studies are usually able to show. These studies provide insight in three areas – the harms experienced by children who gamble, the characteristics of those who experience gambling harms and the relationship between gambling behaviours and harms experienced. The second body of literature consists of studies evaluating the effectiveness of interventions to reduce youth gambling/gambling harms. We set out more detail about each set of studies, their findings and their limitations, below.

³ The survey was not able to gather data for Wales in 2020 due to the impact of the Covid-19 pandemic on data collection

⁴ The legal age for playing the National Lottery in the UK is currently 16, but the government announced in December 2020 that this will rise to 18 from April 2021.

Characteristics of the evidence base and limitations

Studies of the relationship between youth gambling and other negative outcomes

We identified 41 studies looking at the relationship between gambling among young people and other negative outcomes, including four review studies (Blinn-Pike *et al* 2010; Peters *et al* 2015; Kryszajts *et al* 2018; Emond and Griffiths 2020). A handful of the studies we included in our review were also included in these review studies. Studies were conducted across a range of country contexts, with research conducted in the US and Canada most common. In Europe, Italy, Finland and Croatia were popular study contexts. We report one study (Emond *et al* 2019) that explicitly addresses harms among children or adolescents in the UK in the course of our review.

The ages of study participants varied, with the youngest participants aged 9 (Blinn-Pike *et al* 2010), and the oldest aged 24 (Emond *et al* 2019). Most studies were among secondary school aged adolescents, and conducted in school settings. We chose to include studies where the oldest participants were aged 18 and above as long as the study also included younger participants and was designed to look at gambling in youth/adolescents. Restricting the review only to studies where all participants were under 18 would have narrowed the evidence based substantially. Most studies used samples that included both male and female participants.

The studies we reviewed generally employed a similar design, requiring participants to complete questionnaires on their gambling behaviour and other outcomes of interest, such as alcohol and substance use, mental health problems, academic performance and crime/delinquency. Data were then analysed to identify associations between gambling and these other variables. There are a few important limitations associated with these designs (as identified by study authors). First, asking young people to provide information on their gambling behaviour and other undesirable behaviours could lead to biased responses, as they may feel unwilling to disclose the full extent of any illegal or questionable activities.

Second, and perhaps most critically, the surveys were typically conducted at a single point in time, and thus collected cross-section data. This sort of data can only be used to identify associations between variables rather than causal relationships – it can be concluded that gambling among young people is associated with substance use, for example, but it cannot be concluded that gambling caused that outcome. It is equally possible that the causal relationship runs in the other direction (from substance use to gambling), that it runs in both directions simultaneously, or that the relationship isn't causal at all. Indeed, one view is that multiple risk behaviours co-occur among adolescents, with common risk factors for both gambling behaviour and other outcomes such as substance use, delinquent behaviour, etc. (see for example Lee *et al* 2013; Kryszajts *et al* 2018; Cook *et al* 2015).

Authors also point to a range of other limitations associated with their studies. These include the failure to use validated measures of problem gambling behaviour, question marks over the generalisability of results when studies are not carried out among representative samples and the possibility of response bias given most surveys were carried out in school time (and therefore exclude any students who have dropped out of school or were absent that day). It is also worth noting that comparing results

across studies is very challenging given the range of different measures of gambling behaviour used by researchers (Peters *et al* 2015).

Studies evaluating the effectiveness of interventions to reduce youth gambling

We found 15 studies looking at the effectiveness of interventions to reduce gambling or gambling harms among children and adolescents. This number includes three systematic review studies; two examining the effectiveness of youth gambling interventions (Keen *et al* 2017; Ladouceur *et al* 2013) and one providing an overview of the evidence base on gambling prevention programmes for children (Kourgiantakis *et al* 2016).

The interventions that have been evaluated are generally school-based programmes for secondary school aged students. They typically involve a mixture of activities – videos, online exercises, classroom discussions and activities, but vary in length, some just consisting of a single session (Keen *et al* 2017). One study (Hansen and Rossow 2010) evaluated the impact of a national change in legislation on the gambling behaviour of students; the removal of note acceptors on slot machines in Norway. Participants in the studies reviewed ranged in ages from 8 (Ren *et al* 2019), to 20 (Williams *et al* 2010), but were generally teenagers, and included both males and females. We found studies conducted in a range of country contexts in mainland Europe and North America, but did not identify any carried out in the UK.

In terms of the evaluation approach, the studies used experimental or quasi-experimental designs with a treatment and a control group, where the treatment group received the intervention, and the control group did not. Questionnaires measuring outcomes of interest (gambling knowledge, attitudes, behaviours etc.) were given to participants in both groups just before the intervention began and again after the intervention had finished. Some studies included follow-ups, where participants were surveyed again some time after the end of the intervention, to see if any changes had stuck.

The main limitations of these studies are summarised by our systematic reviews. Particularly importantly, many studies neglect to evaluate behavioural outcomes, instead focusing on gambling attitudes and knowledge, making it impossible to judge whether interventions are successful in preventing gambling or problem gambling (Keen *et al* 2017, Ladouceur *et al* 2013). Where gambling behaviour is looked at, the way it is measured becomes particularly important. Keen *et al* (2017) point to problems with the instruments used to measure problem gambling and suggest that in some cases children may be misclassified as problem/non-problem gamblers based on their reported gambling behaviour. They also point to the generally small number of problem gamblers in study samples, which poses a challenge to analysing the effects of an intervention on this group.

Another important limitation is that follow-up data, where collected, was typically collected only a short time after the conclusion of study, precluding a judgement of whether any changes resulting from the intervention are able to persist over time (Keen *et al* 2017, Ladouceur *et al* 2013; Kourgiantakis *et al* 2016). Other limitations include the potential for response bias in the completion of surveys (where participants choose not to give accurate answers) (Keen *et al* 2017), and the failure of studies to collect implementation data, which would provide reassurance that the intervention was conducted in the way it was designed to be (Ladouceur *et al* 2013).

Gambling harms

We found studies examining the relationship between youth gambling and a range of other negative outcomes. One systematic review (Blinn-Pike *et al* 2010) examines the entire field of adolescent gambling research between 1985 and 2010, and concludes that the best evidence exists for relationships between adolescent gambling and substance use and delinquent behaviours. This resonates with our review of the more recent literature (2010 onwards), though it is also clear that a much wider range of associations have been identified.

Delinquent behaviours

We identified a scoping review study looking at the relationship between problem gambling among adolescents and delinquent behaviours⁵ (Kryszajtys *et al* 2018). This included nine studies, all conducted in North America and published between 2000 and 2016. In the authors' definition, delinquent behaviours include those that cause direct harm to others and are illegal, and on these grounds excludes drinking, drug-taking and truancy. The authors conclude that there is evidence of a "consistent moderate to strong association between problem gambling and delinquent behaviour" (Kryszajtys *et al* 2018, pp. 894). They do not necessarily see this relationship as causal however, suggesting there may be common underlying causes for both gambling and delinquent behaviours.

We identified five further studies not included in the Kryszajtys *et al* (2018) review that look at the relationship between youth gambling and delinquent behaviours (Zhai *et al* 2020; Yip *et al* 2011; Vitaro *et al* 2015; Rasanen *et al* 2015 and Chaumeton *et al* 2011). All find positive associations between gambling and crime, violence or other delinquent behaviours. One study, by Vitaro *et al* (2015), looks at multi-year data on youth gambling and delinquency. They find evidence for a two-way relationship – that higher initial gambling activity predicts a subsequent increase in delinquency, and that higher delinquency predicts a later increase in gambling.

Academic performance

Six studies report on associations between youth gambling and academic performance (Yip *et al* 2011; Vitaro *et al* 2018; Gómez *et al* 2020; Floros *et al* 2015; Chaumeton *et al*, 2011 and Andrie *et al* 2019). All studies identify a negative relationship, with gambling linked to lower attainment in school. This relationship seems to be strongest in problem gamblers (Yip *et al* 2011; Andrie *et al*, 2019). Vitaro *et al* (2018) note evidence of a relationship over time, with gambling participation at age 14 predicting a worsening in academic performance from age 14 to age 17 (Vitaro *et al* 2018, pp.888).

Substance use

We found one systematic review study examining the relationship between adolescent gambling and the use of tobacco, alcohol and illegal drugs (Peters *et al* 2015). This included ten studies among unique US adolescent samples. The authors' main conclusion is that a positive association appears to exist; "[d]espite methodological differences, most studies showed significant associations of gambling with tobacco, alcohol, and other illicit drug use" (Peters *et al* 2015 pp.206).

⁵ 'Delinquent behaviours' and 'delinquency' are the terms used widely in the studies we reviewed, which were predominantly conducted in North America.

Studies looking at the relationship between youth gambling and substance use were common in our sample, and we identified several studies not included in the Peters *et al* review. These studies reinforce the finding that young gamblers are more likely to drink alcohol, take drugs and smoke (see for eg Zhai *et al* 2020; Gallimberti *et al* 2016; Tozzi *et al* 2013). Studies also find associations with the use of stimulants such as coffee, energy drinks and psychoactive substances (Gallimberti *et al* 2016; Buja *et al* 2020; Striley *et al* 2017).

Risky internet behaviours/internet addiction

Online gambling specifically is found by several studies to be associated with indications of internet addiction (Tsitsika *et al* 2011; Floros *et al* 2015; Critselis *et al*, 2013). Gómez *et al* (2020) also report that online gamblers were more likely to engage in risky or problematic internet behaviours, such as contacting strangers or cyberbullying.

Mental ill health

Six studies in our sample explore the relationship between adolescent gambling and measures of mental health, including self-reported depression and mental distress (Yip *et al* 2011; Potenza *et al* 2011; Dussault *et al* 2011; Cook *et al* 2015; Chaumeton *et al* 2011; Hanss *et al* 2014). Most of these studies focus on *problem* gambling, rather than gambling activity of any level or intensity. Dussault *et al* (2011) note indications of a relationship over time, with gambling problems at age 17 predicting a subsequent increase in depressive symptoms. The relationship also appears to run in the opposite direction too, from depressive symptoms to gambling problems (pp.130).

Emotional and behavioural problems

A handful of studies look at the broad category of emotional and behavioural problems, which includes emotional symptoms, conduct symptoms, hyperactivity/inattention symptoms, peer relationship problems and prosocial behaviour (see Paleologu *et al* 2019). These studies all report a positive association between adolescent gambling and emotional/behavioural problems (Paleologu *et al* 2019; Critselis *et al* 2013; Floros *et al* 2015).

Social/psychological effects

Two studies in Finland by Raisamo *et al* (2013; 2020) using national surveys look explicitly at the harms experienced by adolescents who gamble. They find ‘feeling guilty or ashamed’ to be the most prevalent type of harm among both male and female respondents (Raisamo *et al* 2020) and among frequent gamblers (Raisamo *et al* 2013). ‘Disruptions of daily rhythm’, ‘problems with relationships’, disruptions in school/work’ and ‘conflicts with friends’ were also commonly selected options.

Financial problems

Financial harms from gambling are rarely touched on in the studies we reviewed. Though Raisamo *et al* (2013, 2020) include them as an option in their survey of adolescent gambling harms, they do not appear to be a strong concern among respondents. A few studies report worse financial harms among young problem gamblers (see Hanss *et al* 2014; Livazovic and Bojcic 2019; Splevins *et al* 2010). For example, Splevins *et al* (2010) find that “Significantly more problem gamblers than non-problem gamblers had sold personal property in order to gamble...and committed illegal acts to obtain money” (pp.197).

Early fatherhood

One study (Lee *et al* 2013) looks at the association between adolescent gambling and early fatherhood, defined as conceiving a pregnancy by age 20. They find that problem gamblers were most likely to experience this outcome, followed by social gamblers, then non-gamblers. The authors emphasise that they view these outcomes as co-occurring, rather than causal.

Gambling harms in a UK sample

We identified one study that looks at the negative outcomes associated with gambling by young people in a UK sample. Emond *et al* (2019) utilise the Avon Longitudinal Study of Parents and Children (ALSPAC) cohort to look at gambling behaviours from the age of 17 to 24. The study looks at the relationship between problem gambling and mental health, crime and substance use outcomes, though data on these outcomes were only collected in the final survey of participants at age 24. The authors identify associations between at-risk and problem gambling and depression and anxiety, involvement in crime and alcohol misuse, smoking and illegal drug use. The authors describe these relationships as correlational, and point to limitations of the dataset in attempting to draw causal inferences.

Characteristics of those experiencing harms

Males vs. females

We see a mixed picture when looking at the link between gambling and other negative outcomes across genders. Several studies find that gender does not make a difference; Vitaro *et al* (2015), for example, find no difference in the relationship between gambling and delinquency between males and females, and Chaumeton *et al* (2011) find that the relationship of youth gambling with substance use, academic performance, mental health and violence/anti-social behaviour is similar for girls and boys. Other studies point to different relationships depending on the outcome in question (Zhai *et al* 2020), while there is also research suggesting that boys are more likely than girls to experience harms from gambling (Rasanen *et al* 2015; Livazovik and Bojcic 2019). There seems to be relatively good evidence, gathered in a range of country contexts, that males are more likely than females to be problem gamblers in adolescence (Calado *et al* 2017). This also appears to be the case in the UK specifically (Emond *et al* 2019, Gambling Commission, 2018).

Relationship between individual behaviours and harms

Gambling severity/frequency

The question of how gambling harms or the experience of other negative outcomes varies with gambling frequency or severity is not easy to answer from the evidence we identified. Neither systematic review (Krszajtys *et al* 2018; Peters *et al* 2015) addresses this question directly, and the remaining studies we reviewed use a range of measures that do not allow for ready comparison across studies. Some compare gamblers with non-gamblers, while others stratify participants according to gambling behaviour (frequency of gambling or problem vs. non-problem gambling), measuring these behaviours in different ways.

From a high-level assessment of the evidence, it generally seems to be the case that more frequent gambling or problem gambling is more closely associated with experiencing other negative outcomes than infrequent or non-problem gambling.

Age of gambling onset

One study explicitly examines the implications of age of gambling onset among adolescents. Rahman *et al* (2012) define early-onset gambling as aged 11 or under, and find that problem gambling is more common among this group than among those who started gambling at age 12 or older. Looking at the relationship between problem gambling and substance use, academic performance and depression, they do not find a difference in the strength of the relationship for earlier and later onset gamblers.

Gambling online vs. offline

A few of the studies we found compare adolescents who gamble online with those who gamble in other settings, generally finding that internet gambling is more likely to be associated with negative outcomes. Internet gambling is related to a higher likelihood of problem gambling (Potenza *et al* 2011; Canale *et al* 2016a; Brunelle *et al* 2012), while Gómez *et al* (2020) find that, in their sample of Spanish adolescents, online gamblers had worse academic performance than non-online gamblers. Among Canadian students, Brunelle *et al* (2012) find that substance misuse and delinquency were more common among internet gamblers than non-internet gamblers and non-gamblers.

Interventions that can mitigate harms

In looking at the effectiveness of the interventions to reduce child/adolescent gambling that have been tried, we focus on the findings of the two systematic review studies that address this question – Keen *et al* (2017) and Ladouceur *et al* (2013), drawing on the findings of other studies not included in these reviews to provide further insight. Ladouceur *et al* (2013) focused on universal⁶ gambling prevention programmes, which they divide into two types – gambling-specific prevention programmes, which focus on providing information directly related to gambling, and gambling and related skills studies, which look to develop wider skills that can help students to avoid risk behaviours, such as problem solving and coping skills. They reviewed 15 studies published between 1993 and 2010. Keen *et al* (2017) look only at school-based gambling education programmes, including 19 different studies published between 1993 and 2016.

The included studies report on three main sets of outcomes – what Keen (2017) terms *cognitive outcomes* (including knowledge, perceptions and beliefs about gambling), *skills* that may be related to the decision to gamble and *behavioural outcomes* (referring to gambling behaviour). Cognitive outcomes are the most common outcome reported by the studies we reviewed, with less evidence on behaviour change and the development of protective skills.

6 Universal prevention programs are delivered to all, regardless of need (ie they do not specifically target those at risk of the behaviour)

Intervention effectiveness: Improving knowledge and changing attitudes towards gambling

Looking first at the findings from the systematic review studies, the general consensus is that interventions can increase knowledge about gambling, improve attitudes towards gambling and address gambling-related misperceptions (Ladouceur *et al* 2013; Keen *et al* 2017; Kourgiantakis *et al* 2016). However, Ladouceur *et al* (2013) point out that the size of the observed effect varies significantly across studies, and there is a lack of evidence that any improvements that are observed are lasting.

The wider literature generally reinforces these findings. Looking at different interventions in different contexts, Ren *et al* (2019), Parham *et al* (2019), Huic *et al* (2017) and Calado *et al* (2020) all observe improvements in measures of knowledge, awareness or perceptions about gambling. The study by Ren *et al*, which looked at the ‘Don’t Gamble our Future Away’ program in Central Illinois, US, points to the knowledge benefits of receiving the intervention multiple times, and also provides some evidence that these effects can be maintained for at least a year after the intervention.

Calado *et al* (2020) find that intervention effects may vary according to the gambling behaviour of participants. In a school-based intervention in Portugal informed by Cognitive Behaviour Therapy (CBT) models and theories of prevention, they find that improvements in knowledge and misperceptions occurred among both problem and non-problem gamblers, while changes in attitudes towards gambling were only seen among non-problem gamblers.

One of the studies we reviewed finds that cognitive outcomes moved in the wrong direction over the course of intervention. Evaluating the “Clean Break” video intervention among a sample of high school students in Montreal, Canada, St. Pierre *et al* (2017) detect small but significant increases in positive attitudes towards gambling among both the treatment and the control group, both directly after the intervention and at three-month follow-up.

Intervention effectiveness: developing protective skills

The evidence we found on the effectiveness of interventions in nurturing skills that can guard against gambling harms among youth is a little more mixed. Ladouceur *et al* (2013) judge from their review that “their impact on personal and interpersonal skills remains inconclusive” (pp.156). Both Keen (2017) and Kourgiantakis *et al* (2016) highlight that, at least in some studies, positive effects on skills including problem-solving, decision making coping and self-monitoring have been observed, though Keen *et al* also point out that we do not yet have evidence that these improvements can help to prevent the emergence of gambling problems in the future. One further study, conducted in Croatia by Huic *et al* (2017), reports on skills outcomes. They observe no significant effect of their youth gambling prevention programme on “problem solving skills, refusal skills, and general self-efficacy” (pp.1026).

Intervention effectiveness: changing gambling behaviour

Changing gambling behaviour is perhaps the most important outcome for a gambling intervention to try to effect, but it also appears to be the least studied outcome, and the outcome for which successes are least likely to be reported.

Ladouceur *et al* (2013) report that none of the gambling-specific prevention programmes they reviewed had a significant effect on gambling behaviours, though behaviour changes were observed in some of the gambling and related skills interventions. Typically, these effects were of small to medium size, and it was not clear whether they were able to persist over the long-term. Of the nine studies reporting behaviour outcomes in Keen *et al*'s review (2017), five report that gambling behaviours had been successfully modified by the intervention.

Of the additional studies we reviewed where behaviour outcomes were included, most do not find changes to gambling behaviour, as measured by gambling frequency, or money spent gambling (Huic *et al* 2017; St Pierre *et al* 2017; Calado *et al* 2020). Calado *et al* (2020) do record a reduction in the number of hours spent gambling per week, though this change is only seen among the problem gambling group, not among non-problem gamblers. One intervention that does appear to have been successful in reducing the frequency of gambling among adolescents is the removal of note acceptors from slot machines in Norway. This national measure, evaluated by Hansen and Rossow (2010) is found to be associated with a reduction in slot machine gambling frequency of 20 per cent, a reduction in overall gambling frequency of 10 per cent and a reduction of 27 per cent in the proportion of adolescents gambling higher amounts of money (>63 Euros) on slot machines in the preceding week (pp. 70, 76).

Some studies also report the impact of their intervention on rates of problem gambling in their sample. Hansen and Rossow (2010) observe a reduction of 20 per cent in the proportion of problem gamblers following the removal of note acceptors on slot machines, controlling for other variables, while Calado *et al*'s (2020) CBT-informed intervention is associated with a reduction in the proportion of problem gamblers in the treatment group from 21.4 per cent to 7.7 per cent comparing pre-intervention and follow-up. Ren *et al* (2019) find unclear effects of the 'Don't Gamble our Future Away' program on the risk of problem gambling. Receiving the intervention twice was associated with a reduced risk of problem gambling, but this effect wasn't seen in participants receiving the intervention more than twice.

Identified gaps in the evidence

Evidence gaps related to harms

Our review points to a clear gap in the evidence around study designs that utilise longitudinal data. In particular, prospective studies (which follow the same participants over time), would enable researchers to look more directly at the direction of the relationship between gambling and other negative outcomes (see, for example, Splevins *et al* 2010; Peters *et al* 2015; Emond and Griffiths 2020). These studies would help to address the big question over this body of research, which is whether negative outcomes observed among young gamblers were actually *caused* by gambling.

Others point to the need for more research into how gambling and other problem behaviours might co-develop, and how this might differ according to variables like gender, ethnicity, age and socio-economic status (Kryszajtys *et al* 2018). Similarly,

Rasanen *et al* (2015) urge more of a focus on the common risk factors for gambling and other problem behaviours.

There are a number of suggestions to further develop and build on the existing evidence base. Blinn-Pike *et al* (2010) suggest that studies should broaden their focus, and look at the co-occurrence of youth gambling with other behaviours, such as sexual activity. They also highlight the need to study differences across ethnic and racial groups, as do Dussault *et al* (2011) who echo the call for research in more ethnically diverse samples. Canale *et al* (2016a) suggest that there should be more attention to the frequency of gambling activity, and how this may affect outcomes. Emond and Griffiths (2020) and Emond *et al* (2019) point to concerns over a link between gaming and problem gambling among young people, once again suggesting the need for longitudinal studies to shed light on the nature of this relationship.

Finally, measurement issues might also merit further attention from researchers. In particular, there are calls for the development and use of more validated measures of problem gambling among children and adolescents, to more accurately assess the relationship between problem gambling and other outcomes (Slavin *et al* 2013; Blinn-Pike *et al* 2010).

Evidence gaps related to interventions to reduce youth gambling and associated harms

The evidence we reviewed points to several important gaps in knowledge around what works to prevent youth gambling and associated harms. The lack of longer-term follow ups is an absence flagged by many authors (see Ladouceur *et al* 2013; Keen *et al*, 2017; Canale *et al* 2016b; Calado *et al* 2020; Huic *et al* 2017) and means we do not know whether gambling interventions can have lasting effects on participants' beliefs about gambling and gambling behaviour.

Also notable is the lack of interventions designed specifically for children and adolescents at risk of gambling problems, or already experiencing them (Kourgiantakis *et al* 2016). The interventions for which we found evaluations have generally been universal interventions, given to participants irrespective of need and gambling behaviour. Ladouceur *et al* (2013) suggest it may be more effective to tailor interventions according to the needs and characteristics of students, and Donati *et al* (2014) also call for interventions to be targeted at at-risk youth.

Several authors point to the need to try different intervention designs. Kourgiantakis *et al* (2016) suggest a role for family-focused prevention strategies, which have been shown to be effective in research into substance use. Keen *et al* (2017) argue that the design interventions should be geared more towards achieving behaviour changes, with a stronger theoretical underpinning. Toridita and Lupu (2013) suggest that the impact of combining different prevention programmes should be investigated, while Donati *et al* (2014) and Walther *et al* (2013) argue that more attention needs to be paid to uncovering the specific elements of prevention programmes that drive changes in outcomes.

More generally, in many studies, the need for interventions to be trialled and evaluated in different settings, with larger and more diverse samples, is noted (see Canale *et al* 2016b; Calado *et al* 2020; Parham *et al* 2019).

To this list, we might also point to the apparent lack of gambling interventions evaluated among the diversity of children and young people in the UK. This could be a valuable area for future research as insights from other country contexts may not always be directly transferrable to the UK setting.

Conclusion

There is no shortage of research into gambling among children and young people – 56 studies published since 2010 met our inclusion criteria and were reviewed here. The difficulty is that these studies are not necessarily able to answer our questions of interest. Looking first at the evidence of gambling harms among children, we found that the literature we reviewed is generally able to point to clear associations between youth gambling and a range of other negative outcomes, including delinquency, substance misuse, poor academic performance and mental ill health. The cross-sectional study designs used do not allow us to deduce whether these outcomes were *caused* by gambling, however. Where longitudinal studies have been conducted, they tend to point to a reciprocal relationship between gambling and the outcome in question, with each reinforcing the other (eg Dussault *et al* 2011; Vitaro *et al* 2015).

Greater use of prospective longitudinal data, from studies which follow the same participants over time, would provide better evidence on the direction of these relationships.

Turning to the evidence on what works to prevent gambling or gambling harms among youth, we found evaluations of a number of school-based interventions. While there seem to be good indications that these interventions can improve knowledge about gambling and attitudes towards it, the evidence on their impact on gambling behaviour is less extensive and more mixed. It also isn't clear whether any changes resulting from these interventions are able to persist over time, making the case for studies with longer-term follow-ups. The growing diversity of UK schools would need considering in any study, as well as schools' greater reliance on online materials.

Finally, we note the lack of evidence relevant to our research questions that was gathered in the UK context. This may suggest a need for more studies conducted among UK children and young people, as well as those who are their key influencers.

Gambling by Women

Overview: literature review

In this section, we report the findings of our review of the literature related to gambling harms among women gamblers. Our search of academic and grey literature databases (see Appendix A for details) returned 2004 results once duplicates had been removed. After our first sift, this was reduced to 144 papers. Following a more in-depth second sift, we were left with 43 studies. Four evidence reviews were identified, and papers included in these reviews were also removed from the results, leaving 15 studies. We added a further five studies identified from the references of these included papers, giving a total of 20 studies for review.

The prevalence of gambling among women, including problem gambling, has increased in recent years. Gambling participation rates between men and women are similar; for example, the 2010 British Gambling Prevalence Survey found that 71 per cent of women and 75 per cent of men had participated in at least one gambling activity, with 40 per cent of women gambling at least once a week (Wardle *et al* 2011). While evidence suggests that problem gambling is higher among men than women (for example, Wardle *et al* 2011; Hare 2014), the number of women experiencing gambling harms has been found to be increasing (for example, Wardle *et al* 2011). Nevertheless, the evidence base on gambling harms remains largely focused on male gamblers, with findings from this research at times generalised to women gamblers (Merkouris *et al* 2016). This review likewise identified a lack of evidence on gambling harms experienced specifically by women. This lack of evidence is also reflected in the small number of studies that evaluate harm reduction and prevention interventions tailored to women gamblers.

Gambling harms

Reflecting the general paucity of literature on gambling by women, few studies that focused specifically on the harms experienced by female gamblers were identified in this review. Limited search results on this topic were also identified as a key finding in earlier literature reviews on this topic (for example, McCarthy *et al*, 2019). An important theme emerging from the literature relates to female gamblers' perceptions of harm, and whether, in their view, these harms are mitigated or offset by the gains they may experience through gambling.

Two studies look at the experiences of older women and found that the social benefits of interacting with others and non-gambling incentives offered by gambling venues (for example, inexpensive meals) influenced their perceptions of harm from financial losses (Thomas & Lewis 2012; Pattinson & Parke 2017). In the latter study, while women reported regularly gambling more money than they intended to, they tended to view gambling as one of the few leisure activities that older women could access. This suggests that lower perceptions of harms may be a factor in gambling severity among some women. Evidence captured in the review conducted by McCarthy *et al* (2019) also indicates that similar perceptions of gambling venues among migrant women from non-English speaking backgrounds.

Financial problems

A small number of studies identified in this review examine financial harms experienced by women gamblers. One study notes that younger women may experience financial harms more severely than older women, although the study authors were uncertain as to the reasons behind this discrepancy (McCarthy *et al* 2018). A Canadian study reports that almost 60 per cent of participants in a treatment programme for women gamblers had accumulated debts related to their gambling behaviour, through credit cards, unpaid bills and loans from banks or family members. Furthermore, almost one third reported pawning or selling personal property to finance their gambling (Boughton *et al* 2016).

Mental ill health and social/psychological effects

Participants in a group treatment programme pilot were asked to identify drawbacks to their gambling from a list of 60 options. Almost all reported feeling 'anger at myself or others', 'stress over money loss', 'guilt' and 'secrecy about the time or money spent' gambling. Other widely reported drawbacks included worry about their financial future, feeling out of control and difficulty sleeping. Symptoms of mental ill health were also reported, such as depression (79 per cent) and anxiety (75 per cent) as result of gambling (Boughton *et al* 2016).

Ethnicity and sociocultural factors

Several studies identified in this review focus on the harms experienced by women from ethnic minorities and indigenous communities in their national contexts. For example, in the literature review conducted by McCarthy *et al* (2019), two studies involving Māori and Pacific Islander women in New Zealand found that they were more vulnerable to experiencing gambling-related harm than women from European backgrounds. This review also identified evidence from Australia and New Zealand which suggests that women from non-English speaking backgrounds found gambling venues to be accessible and inclusive, although their gambling behaviour had nonetheless negatively impacted upon their lives.

Characteristics of those experiencing harms

Mental ill health

Evidence captured in two recent literature reviews points to the use of gambling among women as a coping strategy or distraction from anxiety and family and work-related stressors (Holdsworth *et al*, 2012; McCarthy *et al* 2019). Another study (which was not captured in these reviews) found that among participants in a treatment programme for women gamblers, 42 per cent had been treated for depression; 31 per cent for anxiety; 8 per cent for manic depression; and 12 per cent for anger issues. More than a third of participants had been prescribed medication for these problems (Boughton *et al* 2016). Another study of gambling treatment out-patients observes that women are more likely than men to gamble to distract themselves from negative mood; are more anxious and experience poorer self-esteem; and have a more significant history of other psychiatric disorders (Echeburua *et al* 2011).

Women gamblers from migrant backgrounds are also reported to be drawn to gambling as a way to cope with the stress of acculturating into their new home (McCarthy *et al* 2019).

Three literature reviews (Merkouris *et al* 2016; Holdsworth *et al*, 2012; McCarthy *et al* 2019) examine the evidence comparing the prevalence of mental ill health among male and female problem gamblers. Women gamblers are observed to be more likely than men to experience personality disorders; depression and anxiety disorders; and general psychological distress. Merkouris *et al* (2016) also report evidence that women problem gamblers are significantly more likely than men to report their mood state or symptoms of mental ill health as a primary trigger for their gambling episodes.

McCarthy *et al* (2019) suggest that these findings point to women gamblers' experiences of harm existing within a complex network of mental health problems, and harmful gambling behaviour may both exacerbate and be perceived to mitigate against these problems. Furthermore, Holdsworth *et al* (2012) highlight evidence which indicates that the co-occurrence of mental ill health among women experiencing gambling harms may delay help-seeking and impede diagnosis, as well as impacting upon recovery and the likelihood of relapse into harmful gambling.

Exposure to adverse experiences

Closely tied with considerations of mental ill health among women problem gamblers, evidence captured in this review also points to exposure to adverse experiences in childhood and adulthood as more prevalent in this population compared to the general population. Merkouris *et al*'s (2016) review of the literature on gender differences associated with problem gambling notes that women are more likely than men to have experienced childhood abuse. Another study reports that among participants in a treatment programme for women gamblers, 69 per cent report emotional abuse as children and 70 per cent report experiencing emotional abuse as adults. Furthermore, 19 per cent had experienced sexual abuse as children and 31 per cent as adults, with similar reporting for physical abuse. Experiences of loss and trauma are also higher than in the general population (Boughton *et al* 2016). Similarly, a study of gambling treatment outpatients notes that nearly 70 per cent had reported experiencing interpersonal violence (Echeburua *et al* 2011).

An Australian study examining gambling harm among aboriginal women also reports that trauma contributed to their experiences of gambling harm, while gambling still drew them in as an escape from their problems (Hagen *et al* 2013).

Merkouris *et al* (2016) also identify studies finding associations between harmful gambling and parent-child difficulties, such as tension and negligence, and academic difficulties.

Social isolation and loneliness

A small number of studies in the review by McCarthy *et al* (2019) indicate that feelings of loneliness and boredom are associated with gambling harm experienced by women, who may view gambling as an escape; this review also reports that women who are motivated to gamble for these reasons are more likely to experience gambling-related harm. A small British study not captured in this review on women who gambled online at least twice a week reports that most of the participants spent significant amounts of time at home and online gambling was a ‘fun’ way to interact with others and provide a temporary escape from their problems (Corney & Davis *et al* 2010). A Spanish study reports similar findings from a sample of gamblers seeking treatment, with women more likely than men to gamble as a coping mechanism for loneliness (Echeburua *et al* 2011). In the context of online gambling, loneliness and boredom are identified as motivating factors for gambling by men (McCormack *et al* 2014).

Age may also be a factor in these experiences. One study notes that social isolation and physical health problems experienced by older women, as well as the lack of available and accessible leisure activities, may lead to increased vulnerability to gambling-related harms among this group (Svensson *et al* 2011). Another study, which examines online gambling, also observes that gambling may increase after women retire or their children leave home (McCormack *et al* 2014). However, it is important to note evidence from an Australian study that reports younger women are more likely than older women to experience gambling harm, although the study authors could not offer a definitive explanation for this discrepancy (McCarthy *et al* 2020).

Gambling activity preferences

A systematic review of the evidence on preferred gambling activities among women notes that women tend to favour non-strategic gambling activities, such as electronic gambling machines and bingo, as compared to men who prefer strategic activities such as sports betting and casino games (Merkouris *et al* 2016). A Spanish study not captured in that review also observes that women problem gamblers are more dependent on bingo than other gambling methods, although slot machines are also popular (Echeburua *et al* 2011).

Relationship between individual behaviours and harms

Evidence around the relative age of women problem gamblers as a factor in motivations to gamble and gambling severity, and perceptions of social and financial gains mitigating or offsetting gambling harms, has been highlighted above. Beyond these discussions, little evidence on the relationship between individual gambling behaviours and women problem gamblers was identified in this review, although one study reports that problem women gamblers were more likely than non-problem female gamblers to play both slot machines and online poker (Morvannou *et al* 2020).

Interventions that can mitigate harms

Few studies identified in this review examine interventions specifically designed for and targeted towards women. Several commentators also note the lack of evidence around effective treatment strategies for women problem and place this paucity within wider issues of male bias in gambling research and the lack of differentiation between male and female gambling (for example, Holdsworth *et al* 2016). McCarthy *et al* (2018) did not identify any research that has specifically adopted a gendered approach to preventing and reducing gambling harms.

Remote group counselling

Boughton *et al* (2016) report on an evaluation of a pilot treatment for women gamblers using clinician-facilitated, group-based teleconference and webinars, and an educational workbook for participants. They note that previously published evidence suggests that on-site outpatient treatment for problem gambling may be difficult for women to access given work and childcare responsibilities, financial constraints and limited ability to travel. Study participants reported being better able to understand their gambling triggers; improve their self-esteem; modify their mood and anxiety levels; feel less isolated; address issues within their relationships; and feel more optimistic about the future.

Boughton *et al* also point to evidence on the effectiveness of telephone versus face-to-face counselling for problem gambling from Tse *et al* (2013), which while not specifically focused on women, has a predominantly female sample of participants. This study detects no significant difference in effectiveness between the two modes of counselling. Participants also report that these modes offer easier access than on-site treatment; save time and travel costs; give greater flexibility; and provide anonymity, a particular advantage for those experiencing shame or who are concerned about identification.

Gamblers Anonymous

Rogers *et al* (2019) report on their scoping review of the evidence on the experiences of women gamblers in Gamblers Anonymous (GA), a face-to-face support service available to both men and women in the UK and many other countries. While the proportion of women attending the groups studied in these papers varies, women are consistently in the minority. The review identifies several barriers to female participation in GA, including differences in the needs of men and women and in approaches to treating their gambling problems, and points to evidence that women often report that GA did not prove to be helpful for them. For example, several studies included in the review highlight the focus in GA on current issues without delving into mental health, relationships and other personal concerns, while evidence suggests that women tend to prefer support and treatment options that explore these matters.

Furthermore, evidence in the review indicates that women, particularly those who have experienced abuse by men (we could not find women on women abuse mentioned in studies), may feel uncomfortable in male-dominated and sometimes macho environments of GA meetings. However, the review notes that 'women-preferred' GA meetings have expanded and approaches to discussing lived experiences of problem gamblers have broadened, leading to increased engagement by women.

Identified gaps in the evidence

Evidence gaps related to harms

Overall, little evidence on the harms that women gamblers experience was identified in this review. Research on gambling prevalence indicates that female participation in gambling and the proportion of women gamblers experiencing harm has been increasing in recent years, yet little is known about the profile of these women and the range of individual, socio-cultural and environmental factors that may influence their gambling behaviour (McCarthy *et al* 2019).

McCarthy *et al* (2018) also highlight the lack of understanding around how women gamblers conceptualise gambling harm, and how this may differ by age and other factors. Furthermore, they note that with an improved evidence base on the harms experienced by women gamblers, more robust measures of gambling harm in women may be developed.

Furthermore, the authors note that the gambling landscape is rapidly changing, particularly with the enhanced offering of online products and the feminisation of gambling venues. The evidence base needs to be updated to reflect the impact of these changes on the harms experienced by women gamblers and how the risks and benefits of gambling are conceptualised.

Evidence identified in this review points to higher rates of mental ill health and exposure to trauma among women problem gamblers than the general population, and that gambling behaviour may both compound and serve as an escape from this. More research is needed to understand the causal relationship between mental ill health and gambling harm, as well as other issues such as substance abuse and unemployment, and thereby to develop interventions including public health approaches.

Finally, much of the evidence on harms comes from self-reporting by women gamblers, for example in surveys and interviews. Research using more independent sources of evidence, for example financial, health and legal data, and longitudinal studies, may add more of a depth of understanding of harms, pathways of causality, and if and how harms may change over time.

Evidence gaps related to interventions

Again, the paucity of evidence on effective harm reduction or prevention interventions relating to women gamblers is striking. A very small number of studies that were identified in this review indicated that women gamblers may find counselling for emotional, relationship and mental health problems helpful in addressing their gambling behaviour. More needs to be understood about the generalisability of these findings, and about how to design and implement such programmes to meet the needs of women from different sociocultural contexts and in different settings. Furthermore, there is a lack of evidence about how successful these interventions are in the long-term in reducing or preventing gambling harms for women.

Other evidence suggests that interventions that are designed or predominantly used by male gamblers may not be effective, or as effective, for women. Many commentators (for example, Holdsworth *et al* 2016; Merkouris *et al* 2016) note the differences in characteristics, motivations and behaviours of male versus female gamblers. McCarthy *et al* (2019) argue that where research focused on male gamblers has been used to inform the design of behavioural treatment programmes and public health initiatives, this could have profound implications for their effectiveness for women. However, there is currently not enough known about harm reduction and prevention initiatives that meet the needs of women to specifically tailor such initiatives to them.

Conclusion

Overall, the review has identified the limited current understanding of women gamblers; their experiences of harm; and harm reduction and prevention interventions and strategies that are effective for women, especially in the longer term. Particularly concerning is the evidence suggesting that male bias in gambling research has resulted in women's needs remaining unidentified and unmet. With women's participation in gambling and problem gambling by women increasing, improved understanding of this issue is essential and a matter of urgency. The diversity of women also needs acknowledging with sexuality a subject that appears surprisingly overlooked among populations.

It should also be noted that much of the evidence that met the inclusion criteria for this study emerged from Australia, New Zealand, Canada and mainland Europe. Very little evidence on gambling harms experienced by subgroups of women in the UK was identified, and interventions to prevent or mitigate these harms. Given the differences in the gambling ecology, for example the availability of and preferences for particular gambling products, and in relevant socio-cultural factors, this presents a clear gap for UK policymakers and other stakeholders seeking to understand gambling harms experienced by women and how to develop effective responses from prevention of harm to treatment.

Gambling on Sport

Sports gambling has traditionally involved gambling at live sporting events such as horse racing. However, opportunities for sports gambling are rapidly expanding through internet and mobile phone technology (Lawn *et al*, 2020; McGee, 2020). The growth of online gambling has also been associated with innovation in how bettors can gamble on sports, with the introduction of options such as live betting during sporting matches and fantasy sports games. Researchers have pointed to the growing prevalence of sports gambling in recent years, in particular in these online forms (Winters and Derevensky, 2019; Palmer 2014).

In our review we sought to identify the literature that relates specifically to the harms experienced by people who bet on legal sports. Our initial searches of academic and grey literature databases identified 1,411 papers (following the removal of duplicates), which we ultimately whittled down to 27 papers meeting our inclusion criteria. We added one further paper identified via targeted searches in Google Scholar, to give a final set of 28 papers for review.

Much of the research we identified was conducted in the US or Australia, and majored on the relationship between sports gambling and problem gambling among sports bettors. The evidence on wider harms associated with sports betting was much scarcer. We also decided to include evidence on the harms associated with the advertising and marketing of sports betting, which particularly emphasises the normalisation of gambling through the consumptions of gambling promotions. We did not identify any studies looking at the impact of interventions to prevent or mitigate the harms of sports gambling.

Harms associated with sports gambling

As discussed in other sections of this report, the literature typically points to the association between gambling activity and other negative outcomes, rather than being able to demonstrate that gambling has caused the outcome in question. The sports gambling literature is no exception, and the evidence we reviewed generally points to correlations rather than causal relationships.

Problem gambling

One theme emerging from the literature is the relationship of sports gambling with problem gambling. In a review for the Department of Health and Human Services in Tasmania, Australia, Palmer (2014) describes this relationship as “perhaps the great unknown, with the research often contradictory and speculative” (pp. 13). Our search identified a number of studies investigating this relationship, but this was often in the context of a specific type of sports betting, such as online betting or fantasy sports. We explore these findings below.

We also found research into the characteristics of problem sports gamblers, mostly conducted in Australia. Russell *et al* (2019a) note that those at risk of problem sports gambling were younger, spoke a language other than English, were single and had a higher disposable income. They do not report any relationship between risk of problem sports gambling and gender. Focusing on *online* sports bettors with gambling problems, Hing *et al* (2017) find that this group is more likely to be male, of younger

age and to speak a language other than English at home compared to non-problem bettors. Also looking at an Australian sample, Russell *et al.* (2019b) obtain slightly different results. They observe that those classed as at-risk or problem gamblers are more likely to be male than non-problem gamblers, but do not identify relationships between age, income or ethnic minority status and gambling-related problems. There is no clear linear relationship between education level and problem gambling severity in their assessment.

Looking at a non-Australian sample and a younger age group (high school students in the US), Marchica *et al* (2017) observe that, while boys are more likely to gamble on sports, girls engaging in sports gambling are more likely to be classed as at-risk for a gambling problem. Older adolescents are also at higher risk of gambling problems than younger ones in this study.

Online sports betting and problem gambling

There is particular concern about the link between online sports gambling and problem gambling (Winters and Derevensky, 2019). As Lopez-Gonzalez *et al* (2019) point out, online sports gambling platforms often integrate new features that change the experience of gambling, such as in-play betting, ‘cash out’ features and fantasy sports games. In their online survey of 659 Spanish gamblers who participated in online sports betting, the authors report that those who make use of these new online gambling options, and those who favour gambling via a mobile phone, are more likely to be classed as problem gamblers (Lopez-Gonzalez *et al* 2019).

Using a qualitative study design involving interviews with 19 British online sports bettors classed as problem gamblers, Parke and Parke (2019) consider the specific aspects of online sports gambling that might be associated with problematic gambling behaviour. They highlight the role of structural features of online gambling platforms, such as instant depositing, cash out features, in-play betting and micro-event betting, that enable gamblers to continue and extend their betting sessions beyond what would be possible in a physical setting.

Similarly, interviews with young adult men in Australia who bet on sports by Deans *et al* (2016) draw attention the potential of online gambling formats to exacerbate harms. Their participants report that online gambling options facilitated them gambling at times and in locations that they normally would not gamble, and on events they would not normally gamble on, including sports events in other countries. Some participants describe how using online platforms encouraged them to engage in more risky gambling behaviours, including more frequent betting and betting (and losing) their winnings. Betting via mobile apps is highlighted as particularly challenging for some, increasing the accessibility of gambling and creating a perception that participants were not gambling with “real money” (Deans *et al* 2016, pp. 115).

Fantasy sports and problem gambling

Fantasy sports involve participants constructing their own virtual sports team to compete against the teams of other users (Pickering *et al*, 2016). Participation in these leagues often requires an entry fee, with winnings paid out to the most successful players at the end of the season, which means they could be considered a form of

gambling (Nelson *et al* 2018). Money is not always involved, however. Daily fantasy sports (DFS) is a shortened version of this game, typically played out over a day or a week rather than a full season. Leagues have an entry fee and commission is paid to the operator (Pickering *et al*, 2016). Marchica *et al* (2017) suggest that the expanded opportunities to bet money and play on an impulse in DFS means there may be a greater risk of it contributing to gambling problems.

We identified several papers assessing the impact of playing fantasy sports on problem gambling, mainly conducted among US college students. These studies tended to find a positive association between playing fantasy sports and having gambling problems (Martin and Nelson, 2014; Martin *et al*, 2016; Marchica and Derevensky, 2016). Martin and Nelson (2014) find some differences in this relationship by gender; for males, the positive relationship between playing fantasy sports and experiencing gambling problems only exists for playing fantasy sports for money, while for females it exists both for playing for money and playing just for fun. Looking at a sample of high school students in the US, Marchica *et al* (2017) also report an association between fantasy sports betting and being at increased risk of gambling problems.

Three papers reported findings on DFS specifically. Martin *et al* (2018) compare the relationship between fantasy sports participation and problem gambling and DFS and problem gambling in a sample of US college students. They find that those who play DFS meet more problem gambling criteria than those who do not. Similarly, in a survey of adults in New Jersey, Nower *et al* (2018) observe that those who play DFS are more likely to experience gambling problems than gamblers who do not. Returning to Marchica *et al*'s study, regular DFS participation (more than once a month) is also associated with increased risk of gambling problems among high school students. Further, it is found to be “the strongest predictor of at-risk gambling behavior in 13–15 year old students” (Marchica *et al* 2017, pp. 437).

Financial harms

A Spanish study by Estevez *et al* (2017), indicates that the risk of financial harms may be heightened among online sports gamblers. Using a sample of men receiving treatment for gambling disorder in a Barcelona hospital, the authors compare gambling behaviours between offline gamblers, online gamblers who do not bet on sports and online gamblers who bet exclusively on sports. They note that online sports bettors made higher maximum bets than offline gamblers, and that both online gambling groups have higher cumulative debts than the offline gamblers. It is important to note though that the sample used in the study was strongly skewed towards offline gamblers, with only small numbers in each of the online gambling groups.

A qualitative study by McGee (2020) in the UK also highlights the potential for online sports gambling to contribute to financial harms. Through focus groups and interviews with 32 active online sports gamblers (all men aged 18-35), the author identifies the experience of financial problems including indebtedness and financial instability, and links “chasing losses” to “the use of pay-day loans, overdrafts and credit cards” (McGee 2020, pp. 91). These financial consequences fuelled other harms, including relationship problems, difficulties at work and mental health issues.

Health and wellbeing

Two studies point to associations between sports gambling and negative health and wellbeing outcomes. Using data from the Canadian Survey of Household Spending, Humphreys *et al* (2019) report that spending on sports betting acts as a substitute to some extent for household spending on exercise. The authors observe that when the price of sports betting declines (eg via an expansion of legal opportunities to bet on sports), spending on exercise (eg gym memberships etc.) also declines, implying reduced participation in exercise.

In New Jersey, US, Nower *et al* (2018) investigate the mental health and substance use correlates of DFS players. They note that DFS players are more likely to use illegal drugs, alcohol and tobacco, report past drug or alcohol problems and report recent mental health problems than other gamblers who did not play DFS. Most strikingly, DFS players were four times more likely to report suicide ideation in the preceding year (pp. 733). Once again, it is important to emphasise the correlational nature of these relationships.

Harms resulting from exposure to sports betting advertising

Our search found studies looking at the implications of exposure to sports betting advertising among both adults and children.

Adults

Looking at adult samples in Australia, three studies by Hing *et al* (2013; 2015a; 2015b) consider the relationship between exposure to gambling advertisements and the intention to gamble. They report that this relationship exists particularly for those who already have gambling problems, indicating that sports betting promotions can intensify gambling harms among a group already vulnerable to them.

Specifically, in a survey of 1000 adults in Queensland, Hing *et al* (2015a) note that problem gamblers are more likely to watch televised sport containing betting promotions, and more likely to report positive attitudes towards these promotions. Problem gamblers in the study also report that exposure to these promotions during sports had “maintained or worsened their problem gambling behaviours” (pp. 129). In a study conducted among 544 Australian participants who already bet on sports, Hing *et al.* (2015b) also comment that problem gamblers were most likely to report being encouraged to gamble from sports betting promotions. Hing *et al* (2013) echo the finding that exposure to betting advertisements via sport is most problematic for those with existing problem gambling behaviours, rather than inducing those who do not have gambling problems to gamble more.

Hing *et al* (2015b) also asked participants about their perceptions of the broader harms associated with consuming gambling promotions during sports viewing. While the average respondent among their sample of sports bettors did not agree that “gambling promotions during televised sport had increased the frequency, expenditure and time spent on sports betting or that it had caused them to spend more money and time on sports betting than intended or caused related harms to them or those close to them”, the average problem gambler did agree with these statements (pp. 2063).

Two qualitative studies identified point to the potential role of sports betting advertising in *normalising* gambling on sports. Both of these studies were conducted among young men who gambled on sports, one in Australia (Deans *et al* 2017), and one in the UK (McGee, 2020). Both studies highlight the ubiquity of sports betting marketing, with this contributing to a view that sports betting is normal (Dean *et al* 2017), or an integral part of watching sports (McGee 2020).

Children

Studies looking at the impact of exposure to betting marketing through sport among children tend to focus on its impact of gambling awareness, and sometimes expressed intentions to gamble, rather than more direct indicators of harm. Studies conducted at sporting venues in Australia by Nyemcsok *et al* (2018), and Pitt *et al* (2016) report high awareness of sports betting advertising and sports wagering itself among children. Meanwhile Pitt *et al* (2017), interviewing children who identify as Australian Football League fans, find high recall of sports betting advertisements and knowledge of sports betting products and language.

We found two studies looking at the relationship between consuming sports betting advertising and gambling intentions among children. Through an online survey of 12 to 17 year olds in Queensland, Australia, Hing *et al* (2014) note that watching televised sports (which contains gambling promotions) is positively associated with participants' intention to gamble, both on sports and otherwise, once they turn 18. Again, the authors do not claim that this is necessarily a causal relationship. The study also collects young people's views on the effect of seeing betting advertisements during televised sports on their desire to gamble on the sport in question. On average, respondents disagree that seeing these promotions encouraged them to bet on the sport, though a sizeable minority agree.

Li *et al* (2018) consider Australian adolescents' implicit association between sports and gambling, and its relationship with intention to gamble. While they find evidence that young people associate sports with gambling, they do not detect a link between this and the intention to gamble.

We did not find any studies looking at the impacts of consuming sports gambling marketing on gambling *behaviour* among children. The evidence appears to be more focused on more indirect or distal effects, rather than the possible proximate harms of sports betting advertising.

Identified gaps in the evidence

The rapid growth of sports betting and the emergence of new modes of gambling on sports mean more research in this area is needed overall. Lawn *et al* (2020) also suggest that more research on sports betting among specific population sub-groups, including women, youth and problem gamblers, would address knowledge gaps, while McGee (2020) recommends more research into the impact of technology on sports betting behaviours. We also note that much of the research on sports betting is conducted among small and narrow samples, often in Australia and the US, implying the need for larger, representative studies in a wider set of country contexts.

Looking at specific types of sports betting activity, there appears to be a need for more research into fantasy sports and daily fantasy sports, given their rapid growth. Researchers recommend more research into the relationship between these activities and gambling-related problems, particularly in larger samples and among more diverse populations (Martin and Nelson, 2014; Martin *et al.*, 2018; Nower *et al.* 2018).

Researchers looking at the effects of exposure to sports betting advertising point to the importance of prospective longitudinal studies to improve understanding of the relationship between consuming sports gambling advertisements and sports gambling behaviour and associated problems (Hing *et al.* 2015a; Hing *et al.* 2015b; Hing *et al.* 2014). Hing *et al.* (2015b) suggest this research may be particularly important for high-risk groups, such problem gamblers and young adult men.

We were also unable to identify studies evaluating the effectiveness of interventions to reduce sports gambling harms in the course of our search. More research into how to reduce harms or protect those at greatest risk of harms from sports betting and the promotion of it may therefore be of value, noting that other public health approaches might also be more effective means of prevention.

Conclusion

The evidence base that we were able to identify on the harms associated with sports gambling appears to be relatively patchy, and more concentrated on certain activities and research questions, such as fantasy sports and children's consumption of sports betting marketing. This is likely related to the fact that the sports betting market is rapidly expanding and innovating, making it difficult for research to keep pace.

There also appear to be methodological difficulties with establishing the harms of sports betting. The fact that sports bettors tend to engage in multiple forms of gambling make it difficult to disentangle the effects of sports gambling specifically (Russell *et al.* 2019a), and we also note a close relationship with online gambling. This creates the possibility that the observed effects of online sports gambling are more related to the *online* dimension of this activity than the *sports* one.

There appears to be a need for both more research overall in this area, and to address specific gaps in the evidence. These include the need for more longitudinal studies to better understand the direction of the relationships between sports gambling and other negative outcomes (eg Lawn *et al.* 2020; Palmer, 2014; Hing *et al.* 2015a), and more research into emerging modes of sports gambling, such as DFS. It is also noted that many studies have been conducted in small samples and among very specific groups, implying a need for larger studies conducted in a wider variety of contexts. We might also suggest the need for more studies conducted in the UK context.



Conclusion

This review focused on four areas: affordability, children, women and sports. These were chosen to reflect areas where there is growing policy interest, with an eye to contributing to the UK Government's review of the Gambling Act 2005.

Our review found that there is a lack of literature addressing affordability in terms of cost benefit analysis of the gambling industry as whole. Industry supporters will point to the benefits of, for example, job creation and possibilities of urban regeneration in building new casinos. These benefits could be contrasted with the Lloyds Banking Group (Muggleton *et al* 2021) analysis which shows higher levels of gambling were associated with markers of financial hardship within their customer base. Also worth consideration is the acceptability of the affordability to the Treasury of the large profits made by industry and some individuals.

Missing from the data is assessment of costs in terms of demands made on the public sector. The NHS (including primary care-based GPs), local authority social care and wider adult services, and prisons are being asked to include gambling as part of their remit and are developing and financing initiatives involving staff training, screening, signposting and support for gamblers and affected others. Calculating the costs of these initiatives to the public purse needs far more research activity if we are to understand the full financial costs of gambling to the UK.

Similarly, there is a lack of evidence about costs to society of children's gambling in terms of their use of mental health services for example. While qualitative research exists about implications for children of their parent(s) being a problem gambler, this is harder to assess quantitatively. Future avenues for research about gambling and children include the need for more longitudinal studies assessing implications for this first generation of children who have been exposed to extensive gambling marketing.

Another, much discussed, area is the blurring of lines between gaming and gambling. Literature about gambling and children and adolescents often focuses on associations with anti-social behaviours. Possibly of more value and where further focus is needed is the research about mental health problems being both a reason for gambling and being caused by gambling in young people – and evaluations of interventions to support children in this area. The need to address resilience and recovery among children and adults would be an important counterpart to such studies to avoid them being deficit focused.

The perception that gambling is a male issue, and the fact that fewer numbers of women come forward for treatment, means women gamblers have been less addressed in the literature than men; as with children, there is a lack of evidence about evaluations of tailored treatment approaches for these groups or family-focused interventions.

The need to develop more robust, personalised measures for quantifying gambling harms was mentioned in relation to children and cost benefit analysis (GambleAware, 2020). Current measures for diagnosing gambling addiction, for example, may not be relevant for screening the general population for being affected by gambling related harms or for measuring outcomes from treatment for specific client groups with co-morbidities or multiple long-term conditions. Wardle *et al.* (2019) suggest a range of areas where measures could be used more systematically to understand

and monitor gambling related harms (Wardle, 2019). These relate to loss of employment, experience of bankruptcy and/or debt, loss of housing/homelessness, crime associated with gambling, relationship breakdown/problems, health-related problems, suicide and suicidality. Future work measuring the role of gambling in areas such as these could shed light on the wider costs of gambling harms to society.

Future studies should look to address the methodological limitations of the existing evidence base. In particular, there is a heavy reliance on self-report data, which is at risk of a range of biases, rather than the use of objective measures of gambling-related harms. Second, much of the data used is of a cross-sectional nature, precluding conclusions about the direction of the relationship between gambling behaviours and the experience of negative outcomes. The analysis of data from prospective longitudinal studies, which follow the same participants over time, would help to address this gap in the evidence.

Given the costs and difficulties of establishing a standalone longitudinal study, including the need for specialist skills and the challenges of data linkage (eg with NHS records), a more practical and feasible approach may be to ensure that existing longitudinal or cohort studies include this subject.

Appendix A

Search Strings

TABLE 3: LITERATURE SEARCH STRATEGY

Topic	Search strings
Children	1 Gambling Disorder/ or Gambling/
	2 (gambling or gamble* or betting or wagering or gambling harm*).tw.
	3 ((patholog* or problem* or addict* or compulsiv* or impulsive* or crav*) adj7 gambl*).tw.
	4 ludomania*.tw.
	5 pokie*.tw.
	6 ((gaming or fruit or slot) adj machine\$.tw.
	7 (video\$ adj1 lotter\$.tw.
	8 or/1-7
	9 Child/ or exp Child Behavior/
	10 (child or children or adolescen*).tw.
	11 9 or 10
	12 8 and 11
	13 limit 12 to (english language and yr="2010 – 2021")
Women	1 Gambling/
	2 (gambling or gamble* or betting or wagering or gambling harm*).tw.
	3 ((patholog* or problem* or addict* or compulsiv* or impulsive* or crav*) adj7 gambl*).tw.
	4 ludomania*.tw.
	5 pokie*.tw.)
	6 ((gaming or fruit or slot) adj machine\$.tw.
	7 (video\$ adj1 lotter\$.tw.
	8 or/1-7
	9 exp Women/
	10 wom?n or girl* or female*.ti,ab.
	11 8 and 11
	12 limit 12 to (english language and yr="2010 – 2021")
Sport	1 Gambling/
	2 Video Games/px [Psychology]
	3 (gambling or gamble* or betting or wagering or gambling harm*).tw.
	4 ((patholog* or problem* or addict* or compulsiv* or impulsive* or crav*) adj7 gambl*).tw.
	5 ludomania*.tw.
	6 pokie*.tw.
	7 ((gaming or fruit or slot) adj machine\$.tw.
	8 (video\$ adj1 lotter\$.tw.
	9 or/1-8
	10 exp Sports/
	11 (organi?ed adj1 sport*).tw.
	12 (sport* adj1 (body or bodies)).tw.

TABLE 3: LITERATURE SEARCH STRATEGY

Topic	Search strings
Sport ctd	13 (sport* adj1 organi\$).tw.
	14 ((sport* or physical* or exercise* or game* or leisure* or recreation* or fitness) adj5 (event* or setting* or sector* or program* or venue* or site* or centre* or center* or facility or facilities)).tw.
	15 or/10-14
	16 9 and 15
	17 limit 16 to (english language and yr="2010 – 2021")
Affordability	1 Gambling/ (5734)
	2 (gambling or gamble* or betting or wagering or gambling harm*).tw.
	3 ((patholog* or problem* or addict* or compulsiv* or impulsive* or crav*) adj7 gambl*).tw.
	4 ludomania*.tw.
	5 pokie*.tw.
	6 ((gaming or fruit or slot) adj machine\$).tw.
	7 (video\$ adj1 lotter\$).tw.
	8 exp Mental Health Services/
	9 exp Poverty/
	10 exp Domestic Violence/
	11 exp Suicide/
	12 exp Social Welfare/
	13 exp General Practitioners/
	14 (mental health service* or domestic violence or partner violence or benefits or social welfare or absence from work or time off work or suicide or self-harm or general practitioner* or GP* or poverty or social services or food bank*).ti,ab.
	15 or/8-14
	16 or/1-7
	17 15 and 16
	18 limit 17 to (english language and yr="2010 – 2021")

Note: the table sets out the search strategies used to search Medline, which formed the basis for the searches performed in all databases.

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