Bournemouth University

Relative risk of gambling products within Great Britain:

Findings from a rapid literature review and secondary analysis project

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*The order of authorship does not imply amount of contribution.

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The authors alone are responsible for the views expressed in this article, which do not necessarily represent the views, decisions or policies of the institutions with which they are affiliated.

EXECUTIVE SUMMARY

Bournemouth University was commissioned by GambleAware to explore the relative harm of different types of gambling in the context of proposed regulatory changes within the UK governments recent White Paper, High Stakes: Gambling Reform for the Digital Age.

Who is this aimed at?

We provide an overview of the relative harm of gambling products with the aim of preventing or minimising harm for those who gamble. This includes recommendations for key gambling stakeholders such as industry representatives, practitioners, researchers and policymakers.

What did we do?

In Phase 1, we conducted a rapid literature review. The review focused on existing academic and selected grey literature on the relative harm of different types of gambling. This combined findings from 44 academic papers published between 2020 and 2023 and numerous datasets within Great Britain (e.g., National Gambling Treatment Service annual statistics from GambleAware, the GamCare helpline summary data (GamCare, 2022), and the statistics on participation and experiencing problem gambling from the Great Britain Gambling Commission).

In Phase 2, we analysed the combined data from the annual Great Britain Treatment and Support Survey for 2020, 2021 and 2022 to provide a more robust overview of the relative harm of different types of gambling. The relative harm was determined by analysing the level of gambling problems (using the Problem Gambling Severity Index, PGSI) by individual gambling types, comparison of engagement in three broad gambling categories (i.e., gaming, betting, lotteries; see details of the categorisation in Section 3, Table 2), and a deep dive into each of the three broad gambling categories.

Our Key Findings

The results of our literature review and secondary data analysis align with the White Paper, highlighting the importance of shared customer databases for improved affordability checks and advocating for more stringent gambling regulations. This includes promoting 'Safer by Design' website principles, lowering stakes for online slots, and implementing additional protective measures for under-25s, particularly in online slots and land-based Electronic Gaming Machines (EGMs), due to their high risk of harm[1] to young adults. Key findings from our secondary analysis, supported by academic research, are as follows:

[1] We note that gambling harms have been defined and measured in different ways, such as through PGSI scores or other metrics on the impact of the gambling behaviour on the individual and affected others. In this report we used PGSI as a measure of the level of gambling problems/harm.

Types of gambling:

- Academic studies have identified EGM use as the most significant predictor of experiencing gambling problems, being responsible for over 50% of such issues. Additionally, a greater frequency of EGM gambling is associated with an increased risk of experiencing gambling problems and gambling-related harms. Furthermore, participating in EGMs has been associated with future gambling-related harm and problematic gambling.
- Based on the reviewed academic evidence, casino games were found to have the highest proportion of individuals experiencing problem gambling after EGMs. This highlights the significant risk associated with casino games, making them one of the most harmful types of gambling after EGMs.
- Sports betting, especially in-play betting and custom sports bets, poses significant risks. Academic research revealed that problem gambling screening scores (such as PGSI scores) are higher for sports bettors than non-sports bettors. Within sports betting, in-play betting was associated with higher PGSI scores and endorsing more gambling-related harms than not betting in-play. Similarly, the use of custom sports betting products, which allow individuals to create their own bets on specific sporting events, was positively associated with higher PGSI scores and greater gambling-related harms. These custom bets often involve complex and varied betting options, which can amplify the engagement and risk factors for gamblers. Academic literature we have reviewed indicates that individuals who use custom sports betting products experience more severe problem gambling symptoms and higher levels of gambling consumption, necessitating additional customer protection measures. However, it is important to note that these findings are based on samples that may not be fully representative of the general population, and further research is needed to determine the specific risks associated with different types of custom bets.
- Young adults (18–34) preferred gaming machines at bookmakers, gambling in casinos, and sports betting, compared to older people, revealed by our demographic analysis. Combining our prevalence analysis on gambling problems across gambling activities, this indicates that younger adults can be at greater risk of gambling harms.
- Lotteries involve lower risk than other types of gambling. Academic studies found that lottery participants had the lowest scores on questionnaires assessing problem gambling, relative to individuals who engaged in other types of gambling. Secondary analyses on the annual Great Britain Treatment and Support Survey indicates that national and other lotteries exhibited the largest proportion of individuals gambling without experiencing problems. However, these forms of gambling are also correlated with harm, found in the academic studies and our secondary analyses.

Modes of gambling:

- Both online gambling and in-person gambling can be harmful. Across academic studies, those who gambled online were more likely to be classified as at risk or experiencing problem gambling than those who gambled offline. However, the secondary data analysis indicates that among the three broad gambling categories, the proportion of those experiencing any problems or ‘problem gambling’ was higher overall in those participating in in-person gaming activities compared to the online gaming.

- Smartphone and tablet betting is associated with higher problem gambling severity scores relative to betting on laptops, based on the review of academic literature.
- Unique structural characteristics in online gambling include engaging in gaming-related activities such as loot boxes and skin betting. These features are integrated into video games and can blur the lines between gaming and gambling. As part of the literature review phase, in a Great Britain study, it was found that adults who engaged in game-related gambling activities, such as esports betting and spending on loot boxes, exhibited a high likelihood of experiencing both problem gambling and disordered gaming. These activities inherently increase the risk due to their accessibility, immersive nature, and the blending of gaming and gambling environments, necessitating targeted measures to address and mitigate these risks.
- Gaming machines in bookmakers, in-person betting on sports, and online casino games are particularly harmful as they exhibited the largest proportion of individuals experiencing gambling problems, as indicated by the secondary analyses on the prevalence of gambling problems.
- The frequency and diversity of gambling activities correlate with problem gambling risks, as shown by the secondary analyses.
- Academic studies have also shown that sports bettors with higher scores on problem gambling screening participated in more types of gambling.

Limitations of current data:

- Given the nature of survey data, our analysis cannot determine causal relationships between gambling harms and other factors. Most academic studies are also based on cross-sectional surveys, which do not enable determination of causality. Longitudinal studies are needed to determine the relative risk of different types of gambling in predicting future harm. Operator data is also useful in more objectively identifying harm with behavioural indicators compared to self-reported data.
- Problem Gambling Severity Index (PGSI) may not be the only indicator for assessing relative product risk. We used multivariate analysis to assess the extent of harms associated with different gambling products, although the nature of the cross-sectional data on which this analysis is based means that conclusions cannot be drawn about causality. There may be a need for further discussion on the categorisation of different gambling types. For instance, scratch cards encompass various forms, which may have different prevalence rates of associated problems. Furthermore, inconsistency of categorisation is observed across different treatment data sources, which may pose challenges inaccurately comparing and synthesising data from different sources. Addressing these inconsistencies is crucial for developing a clearer understanding of gambling-related issues and improving the comparability of research findings.

Key Recommendations

Tailored Regulatory Approaches:

- Prioritise stringent restrictions on the availability and design of Electronic Gaming Machines (EGMs) due to their high potential for harm. This may include reducing the number of machines, lowering stakes, and implementing mandatory breaks.

- Emphasise harm reduction for online gambling via smartphones and tablets, recognising their increased accessibility and potential for impulsive gambling behaviours. This should also include a focus on responsible design and user experience to mitigate risks.

Personalised Prevention and Intervention:

- Operators should continue to develop and enhance systems to identify and provide personalised intervention strategies for online customers displaying risk indicators, utilising customer data and research evidence.
- Regularly assess those who gamble on operator platforms, using standardised harm measures (e.g., PGSI). Consider creating distinct intervention strategies for those participating in low-risk activities like the national lottery compared to those involved in higher-risk activities such as instant win games.

Comprehensive Research and Policy Development:

- Conduct targeted research on in-play and custom betting to inform harm reduction initiatives. This should include investigating the specific risks associated with different types of custom bets.
- Investigate the effects of gambling-like elements in video games (e.g., loot boxes, skins betting), particularly on underage individuals, to develop appropriate regulatory responses.
- Ensure future policies include a robust monitoring and evaluation plan to assess their impact on gambling behaviours and the prevalence of gambling harms. The development of such plans by the DCMS and the Gambling Commission for the Gambling Act Review is a positive step.
- Focus on the needs and risks of groups less represented in gambling research, such as women and ethnic minorities, to ensure interventions are inclusive and effective.
- Study the relative harm of different devices used in online gambling to better understand their risk profiles and inform targeted harm reduction strategies.
- Utilise operator data, which provides objective insights into gambling behaviours and harms, to understand the risk profiles of different gambling products and demographics. This data can inform various research questions and methods depending on the specific issues being investigated.
- Conduct longitudinal studies to provide insight into how gambling behaviours evolve over time, and which products are most likely to predict future harm.

Enhanced Data Utilisation, Consistency and Sharing:

- Mandate a shared customer database between operators to facilitate the identification of players experiencing gambling harms and to provide personalised intervention strategies. This should be overseen by an independent body with strict controls to prevent the misuse of data for marketing purposes.
- Strive for greater consistency in the categorisation of gambling types in research. Align categorisation frameworks used by National Gambling Helpline, Data Reporting Frameworks (DRF), and NHS statistics with the Gambling Survey for Great Britain (GSGB) to enhance data triangulation and the reliability of findings over time. For the

annual Great Britain Treatment and Support Survey, balance consistency with the need for specific updated codes.
- Triangulate findings from various support services (e.g., GamStop, GamBan, National Gambling Support Network, National Gambling Helpline) to gain a comprehensive understanding on the products most associated with seeking support.

1. Introduction

Gambling encompasses an array of product types, including casino games, sports betting, lotteries, bingo, slots, and fixed odds betting terminals, which can be used online or in-person. An academic body of evidence, including studies by Browne et al. (2023), Gooding and Williams (2023), and Ronzitti et al. (2016), indicates variability in the level of risk associated with different gambling products.

This research on the associated harm across different gambling products is driven by the DCMS White Paper, "High Stakes: Gambling Reform for the Digital Age" (2023), which proposes reforms for UK gambling laws affecting both online and land-based products. Given the debate about which types of gambling are more harmful than others, and whether that should direct regulatory change, it is crucial to conduct more up-to-date research to help shape future policy. This is particularly important in light of regulatory change suggested within the White Paper and resulting consultations (e.g., stake limits for online slots, increased gaming machine allowance for land-based gambling, and the absence of the national lottery contributing to levy funding).

As a result, Bournemouth University was commissioned by GambleAware to conduct a multi-phased project. The overarching aim of the project was to provide an overview of the relative harm of different gambling types and provide recommendations for policymakers. Phase 1 aimed to synthesise the existing recent (published in 2020 and after) evidence base whilst Phase 2 aimed to build the evidence further by using data from the 2020, 2021 and 2022 merged annual Great Britain (GB) Treatment and Support Survey (referred to as T&S Survey in this report). A specific focus of the analysis was the relative level of gambling problems (using the Problem Gambling Severity Index, PGSI) across different types of gambling.

2. Phase 1 – Rapid Literature Review

This section covers a desk-based rapid literature review which focuses on existing academic research on the relative harm of different types of gambling and selected grey literature. This supports analysis of the T&S Survey data and complements findings from the academic evidence base.

2.1. Introduction

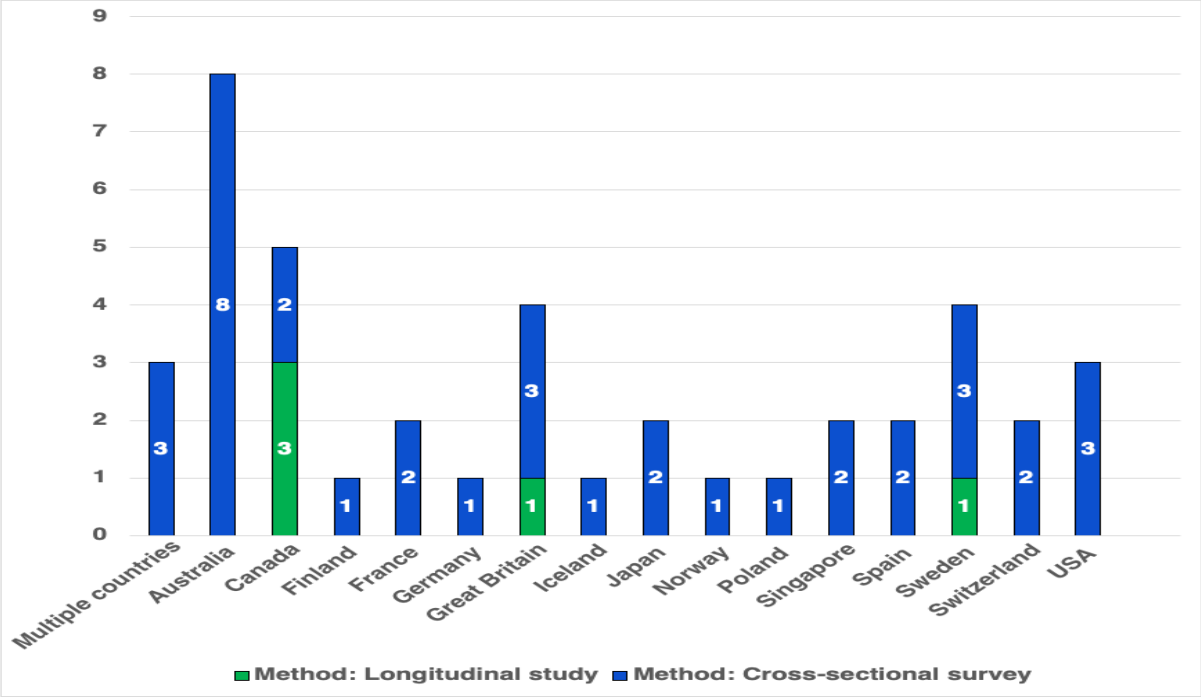
In order to determine the relative harm of different gambling products, it is necessary to compare at least two different products in one research study. However, to date, a systematic review of the relative harm of different gambling products remains absent. Consequently, Bournemouth University reviewed existing academic and grey literature on the relative harm of different types of gambling to answer the question "*What is the relative harm of different gambling products?*" This was intended to help shape the secondary analysis of the T&S Survey data.

2.2. Method

As part of the literature review stage, first we conducted a rapid review of academic literature (Kazi et al., 2021) following the integrative review methodology (Whittemore & Knafl, 2005) with adjustments (Kangura et al., 2014; Tricco et al., 2015). We included peer-reviewed articles published in English from 2020 – 31st December 2023. This timescale enabled us to access a snapshot of recent research, given that gambling products are continuously changing, but also facilitated comprehensive discussion of included studies. A detailed research protocol for searching the academic literature can be found in Part 1 in Appendix 1 and a detailed method in Appendix 1, Part 2.

Eligible academic studies contained primary quantitative research (cross-sectional or longitudinal studies) that quantified the relative harm of different gambling products. We ran systematic searches in academic databases (CINAHL, PsycInfo, Web of Science, Medline and SCOPUS). Studies were quality assessed using the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018), see Part 3 in Appendix 1. We identified 497 articles. After we removed 104 duplicates, 393 articles were analysed using the inclusion and exclusion criteria. From this, 42 studies using 39 datasets remained. Distribution of the studies based on the countries in which the research took place and methods used is presented in Figure 1.

Figure 1. Distribution of studies across the method vs. country



Across reviewed academic studies populations were mainly national cohorts or population representative samples (28 studies), with analyses conducted on those who gambled at least monthly. Four studies focused specifically on young people. Most studies assessed gambling or gambling harms using the Problem Gambling Severity Index (PGSI; 27 studies). In the next section we discuss the relative harm of different gambling products, based on findings from the literature. More detailed information about the studies is provided in Appendix 1, Part 2.

To complement the academic literature review and to facilitate analysis, explanation and better triangulation of the findings with the T&S Survey, we conducted a review of selected

grey literature from GB. We focused on GB so the findings could be directly compared to the T&S Survey data. Grey literature included reports from relevant charities reporting survey responses from the GB population that were most relevant in analysing and explaining T&S Survey results. We reviewed GB datasets from a range of sources including the National Gambling Treatment Service (NGTS) treatment data (GambleAware, 2022), the GamCare helpline summary data (GamCare, 2022), the Patterns of Play report (Forrest et al., 2022), Gambling Commission statistics on participation and problem gambling to 2023 (Gambling Commission, 2023) and Gross Gambling Yield, as determined by the Gambling Commission industry statistics (GGY; Gambling Commission, 2022).

2.3. Rapid literature review findings

This section discusses the literature review findings regarding the relative harm of different gambling products and modes. It synthesises results from academic and selected grey literature.

2.3.1. Online versus offline gambling

Across countries, online gambling was associated with more harm than offline gambling. The most common pattern of risk, found in large-scale population-representative surveys (over 15,000) in Australia, Spain, and among Swiss young male adults (2000 conscripts to the Swiss army aged 18-22 years and a cohort study of over 5000 Swiss young adults (mean age 28)), is that prevalence of problem gambling is highest among mixed-mode gamblers, followed by online only gamblers, and lowest among offline only gamblers (Hing et al., 2022; Marmet et al., 2021; Secades-Villa et al., 2023; Tomei et al., 2022). In a national Australian survey of over 15,000 participants, mixed-mode and online-only gambling were significant predictors of problem gambling severity even after controlling for number of gambling forms (Hing et al., 2022). This may be because those who gamble both online and offline participate in more gambling activities (Tomei et al., 2022).

We then compared just online and offline gambling. In a population-representative study of over 6000 people who gamble in Spain (Diaz & Perez, 2021) and data from three population-representative surveys consisting of over 15,000 people in Norway (Pallesen et al., 2021), those who gambled online were more likely to be classified at risk of or experiencing problematic gambling. In Diaz and Perez (2021), the odds of experiencing a gambling disorder increased as levels of online gambling increased. Finally, in a population sample of over 3000 people who gamble in Finland, those who did not experience any gambling problems were most likely to gamble offline (Lind et al., 2022). In Australia, online gambling was a significant predictor of severity of experiencing problem gambling even after controlling for number of gambling forms (Hing et al., 2022). A national cohort study of 628 people who gamble in France that clustered participants based on age of onset and start of experiencing problem gambling found that the cluster with the highest proportion of those experiencing problem gambling also had the highest proportion that preferred internet gambling (20%) (Guillou Landreat et al., 2020). Overall, academic research suggests that online gambling is associated with greater harm than offline gambling.

Similarly, the NGTS treatment data revealed that among individuals defined as experiencing problem gambling according to the PGSI, 75% reported betting online (GambleAware, 2022). In 2020-21, 84% of callers to the National Gambling Helpline reported online gambling as problematic, whereas only 30% of callers reported in-person gambling as problematic (GamCare, 2022). Finally, among individuals who bet online rather than in-

person, 18.2% had a PGSI score of 1+ (vs 5.8% of adults of who gambled in the last 12 months) (GambleAware, 2022). This would suggest that online gambling tends to be associated with greater harm than offline gambling.

To explain the findings from both GB and academic literature, Gainsbury et al. (2020) and Papineau et al. (2018) suggest that online gambling is correlated with a heightened risk and severity of gambling-related issues compared to in-person gambling, attributing this discrepancy to factors such as greater accessibility, anonymity, immersive design mechanics, and the ease with which users can spend money online. In addition, Oksanen et al. (2021) found that in a cross-national survey of 15–25-year-olds conducted in the US, South Korea, Spain and Finland, participation in online gambling communities was associated with experiencing problem gambling, likely because these communities tended to focus on supporting gambling activities rather than how to prevent gambling harm or overcome gambling problems. Devices used for gambling might also make a difference. In both Spain and Australia, individuals who bet via a smartphone or tablet had higher PGSI scores than those who bet via desktop/laptop (Lopez-Gonzalez et al., 2020).

However, it is important to note that offline gambling can still be associated with considerable harms. For example, a greater proportion of those in GB reporting job and relationship losses through gambling reported using bookmakers, rather than online services (GambleAware, 2022). Further, the association between online gambling and higher levels of problematic gambling is not consistent. In both a population-representative sample in Finland (Lind et al., 2022) and over 1000 weekly sports bettors in Australia and Spain (Lopez-Gonzalez et al., 2020), those gambling on land-based products had higher PGSI scores than those who gambled online. Similarly, national surveys across five European countries (France, Germany, Italy, Poland, Switzerland) found that individuals who gambled offline were more likely to have PGSI scores indicative of problem gambling (Costes et al., 2023). However, these differences are likely attributable to the varying impact of different gambling products rather than the mode of access. Certain products may inherently carry a higher risk of harm due to factors such as the speed at which bets can be placed, the frequency and allure of near misses, and other design features that heighten engagement and potential addiction. These risks are present irrespective of whether the products are used offline or online. For instance, EGMs and casino games, which are often fast-paced and can involve frequent near-miss scenarios, can create a more intense gambling experience, thereby increasing the likelihood of harm (Gooding & Williams, 2023). For example, Lind et al. (2022) attribute their finding to the high prevalence of EGMs in convenient locations. Consequently, the type of product itself, rather than the mode of consumption, plays a more significant role in influencing the level of risk associated with gambling activities. As such, the remainder of the review will compare the harms of specific products online and offline, rather than online and offline gambling in general.

2.3.2. Skill games versus chance games

Two identified studies directly compared participation in skill games (activities based on individual skills, e.g., cards, sports betting) and chance games (e.g., EGMs, lotteries). Among 229 French male participants of online gambling forums (229 skill gamblers, 62 mixed gamblers), individuals who gambled on skill and chance games had significantly higher South Oaks Gambling Screen (SOGS) sores than those who gambled only on skill games (Mathieu et al., 2020). The authors suggest that those who gamble on more different games are more involved in gambling (spend more time and money on it). Indeed, Wardle et al.

(2011) found that gamblers engaging in both offline and online gambling experienced problem gambling more frequently than those using only one medium. In a national survey of adults in Spain (n=17,105; 50% men), those who participated in both strategic and non-strategic games or in strategic games only had higher gambling disorder scores than those who participated only in non-strategic games (Secades-Villa et al., 2023). Those who gamble on skill games may be more likely to develop cognitive distortions, overestimating their skills and underestimating the role of chance (Mathieu et al., 2020). These findings highlight the importance of raising awareness about the substantial role of chance in skill games.

Based on the selected grey literature (see Section 2.2.), individuals who engaged in gambling exclusively on gaming products or on a combination of betting and gaming products were more likely to be identified as experiencing 'problem gambling' (PGSI 8+) (GambleAware, 2022). However, it is important to note that customers who gambled on gaming products were more likely to report gambling with multiple companies. This finding suggests that the volume and breadth of gambling activities may be a more accurate predictor of harm than the specific type of products gambled on. The propensity to gamble across various platforms and with different operators could indicate a higher overall engagement in gambling behaviours, leading to increased exposure to potential risks and harms. Consequently, this finding underscores the need for a holistic approach to gambling harm prevention that considers not only the nature of the gambling products but also the extent and frequency of gambling activity.

2.3.3. Electronic gaming machines (EGMs)/slot machines

Evidence suggests that EGMs are associated with the greatest levels of harm among gambling products, with EGM use being associated with risk of future problem gambling (Williams et al., 2021). EGM participation had the strongest association of any mode of gambling with problem gambling, across large-scale population representative surveys in Australia (Browne et al., 2023; Delfabbro et al., 2020), Canada (Williams et al., 2021), and Iceland (Brosowski et al., 2021). EGM use was also associated with greater risk of problem gambling in population-representative surveys in GB and Japan (Hayano et al., 2020; Wardle et al., 2023), and in in-depth interviews with 300 individuals attending vocational schools in Germany (Orlowski et al., 2021).

In longitudinal studies conducted in Australia, Canada and GB, individuals who reported greater frequency of gambling on EGMs also reported being more at risk of problem gambling (PGSI) at follow-up (Greer et al., 2023; Williams et al., 2023; Wardle et al., 2023) and experiencing more gambling-related harms (Greer et al., 2023). In a GB YouGov survey of approximately 2000 sports bettors, which asked participants to report spend on 23 gambling activities across the past three months, 83.9% of gross expenditure on slot/fruit machines could be attributed to over 40% of those with a PGSI score of 3+ (Wardle et al., 2023). In the same dataset, slots (the most popular type of gaming product) accounted for over 60% of spending on gaming activities (Wardle et al., 2023). One percent of slot participants generated over 40% of GGY, with an average loss over the year of £10,491, and slot games were the main source of loss among heavy losers (Forrest et al., 2022). Slot games were reported as harmful by 31% of callers to the National Gambling Helpline in 2020-21, the highest percentage of any activity, online or offline (GamCare, 2022).

To break these results down in more detail, in an aggregated dataset of gambling prevalence surveys from almost all Australian states, covering approximately 70,000 participants, EGMs

were associated with over 50% of all gambling problems (Browne et al., 2023). Notably, 82% of individuals experiencing problem gambling participated in EGM gambling, and these individuals were over three times more likely to gamble on EGMs compared to those who did not experience problem gambling. Another Australian study found that the association between EGMs and problem gambling was significantly stronger than the association between casino table games and problem gambling (Delfabbro et al., 2020). In Canada, a greater proportion of those who gambled on EGM met the PGSI criteria for problem gambling than those who reported gambling online. Among individuals participating in three or fewer types of gambling, EGMs had the highest proportion of individuals meeting the criteria for problem gambling (Gooding & Williams, 2023). Furthermore, Canadian provinces that do not permit EGMs outside dedicated gambling venues reported the lowest rates of problem gambling (Gooding & Williams, 2023). The at-risk and problem gambling rate for each province or region was predicted by the number of EGMs per 1,000 people (Williams et al., 2021). An Australian study aimed at identifying low-risk gambling limits found that exceeding limits in gambling frequency, gambling expenditure, gambling expenditure as a proportion of gross personal income, session expenditure, and session duration were significantly associated with gambling-related harm for EGM gamblers. This impact was the greatest for any gambling activity (Dowling et al., 2022).

Longitudinally, in Canada participating in EGMs at baseline was associated with reporting future moderate gambling harm and problem gambling (Currie et al., 2021; Williams et al., 2023), and among GB young adults, participating in Fixed Odds Betting Terminals (FOBTs), and participating in slot/fruit machines were associated with increased PGSI scores one year later (Wardle & Tipping, 2023). The association between EGM use and experiencing problem gambling in the future held even after controlling for breadth of gambling involvement (Gooding & Williams, 2023).

In line with the findings from academic literature, in GB EGMs were responsible for £1 billion GGY, 50% of the total for the non-remote betting sector (Gambling Commission, 2022), yet only a small percentage of those who gamble reported using EGMs, suggesting that they concur significant risk of harm. EGMs were reported as harmful by 9% of callers to the GB GamCare Helpline in 2020/21, the highest percentage of any offline activity (GamCare, 2022). Taken together these findings suggest that EGM participation is associated with high risk of gambling harm, likely because they promote high spend and placing of large numbers of bets (Browne et al., 2023). Additional regulation of EGMs is therefore strongly recommended.

2.3.4. Casino gambling/gaming

Large-scale population surveys in Australia, Japan, the USA and Canada found that those who reported participating in casino gambling, whether online or in-person, also reported experiencing problem gambling (Delfabbro et al., 2020; Hayano et al., 2021; Mazar et al., 2020; Williams et al., 2021; Williams et al., 2023). Similar findings were reported in a study of approximately 2000 male conscripts to the Swiss army aged 18-22 years (Tomei et al., 2022). In a GB YouGov survey of approximately 2000 sports bettors, which asked participants to report spend on 23 gambling activities across the past three months, gross expenditure on online casino games was dominated by spend generated from those with PGSI 3+, indicative of experiencing at least moderate gambling-related harm (Wardle et al., 2023). However, these findings are limited by their self-report nature, and their accuracy would be improved by linking expenditure data from player accounts to PGSI scores.

In Canada and the USA, those who gambled monthly or more on casino games were most likely to meet the criteria for problem gambling, with over 60% in Canada, and were significantly more likely to meet problem gambling criteria than those participating in lottery/raffle tickets (Gooding & Williams, 2023; Mazar et al., 2023). Among Canadians participating in three or fewer types of gambling, casino table games had the highest proportion of those experiencing problem gambling after EGMs (Gooding & Williams, 2023). In the USA, those who gambled on casino games were over three times more likely to experience problem gambling than those who gambled on lottery products (Mazar et al., 2020). In Australia, those experiencing problem gambling were 4.55 times more likely to gamble on casino table games than those who were not (Delfabbro et al., 2020), and casino gambling had twice the risk of sports betting relative to frequency (Browne et al., 2023). Additionally, exceeding expenditure and expenditure as a proportion of gross income was associated with gambling-related harm for casino table gamblers, while exceeding gambling frequency and expenditure was significantly associated with gambling-related harm for casino gamblers (Dowling et al., 2022).

The interaction of casino gambling with other types of betting may be important. In a general population sample of 1000 online bettors in Sweden, 44% of those reporting past 30-day online casino gambling and live betting had PGSI scores indicative of problem gambling, relative to 18% of those reporting online casino but no live betting and 4% of those reporting live betting only or neither (Hakansson et al., 2020). However, this may be because engaging in more types of gambling is associated with more risks, rather than because the combination of online casino gambling and live betting is particularly risky.

Analysis of data from two longitudinal cohort surveys of over 4000 people who gambled in Canada found that taking part in casino games predicted moderate gambling harm up to five years later (Currie et al., 2021). In another longitudinal cohort study in Alberta, Canada, with 10,000 participants over a one-year period, the relation between taking part in casino games and future gambling harm held even after controlling for breadth of gambling involvement (Gooding & Williams, 2023).

Online casino games generated £3.9 billion (Gambling Commission, 2022), even though few people took part in such games. Casino games had the highest concentration of spending, such that instances of loss on a single occasion were most likely, and on average, participants lost £1.12 per minute (Forrest et al., 2022). This ties in with the finding from the NGTS that 38% of participants reported gambling on casino slots (GambleAware, 2022), and that mean and median spend were highest among those who gambled at casinos. Among callers to the National Gambling Helpline in 2020/21, 24% reported that they took part in online casino games, the highest percentage after slots (GamCare, 2022), indicating an association between participating in online casino games and harm. Overall, the findings from both academic and grey literature suggest that online casino games are associated with a high level of risk, likely because they both facilitate rapid play and offer a high frequency of reinforcement (e.g., Leino et al., 2015). Although casino games appear to be associated with a lower level of risk than EGMs, likely because they are less accessible and therefore attract a smaller percentage of the population (Browne et al., 2023), these findings suggest that additional regulation of casino games is recommended.

2.3.5. Sports betting

Sports betting, assessed in seven studies that were included in this review, appears to be associated with more risk than lotteries, but less risk than casino gambling and EGMs. Surveys compared sports bettors with non-sports bettors (approximately 300-1500 per group) in Canada, Singapore and GB, and the US (Cooper et al., 2022; Grubbs & Kraus, 2023; Phua et al., 2022). Across these studies, problem gambling screening scores (based on the PGSI and SOGS) were higher for those who bet on sports than for those who reported not betting on sports. Sports bettors were also found to be more likely to bet on non-sports activities, However, in the US, those who bet on sports also participated in more types of gambling than those who did not (Grubbs & Kraus, 2023) and in Canada those who bet on more non-sports activities had higher PGSI scores, suggesting that number of activities bet on confers risk rather than sports betting itself (Cooper et al., 2022). Similarly, in a study consisting of in-depth interviews with 309 students aged 16-30 years in Germany, those who engaged in more sports betting were more likely both to be classified as experiencing problem gambling based on the Stinchfield self-report questionnaire (designed to fit the DSM-5 criteria for problem gambling) and to experience greater gambling-related harms (Greer et al., 2023; Orlowski et al., 2020). Sports betting had the second largest correlation with problem gambling after EGMs, presenting about half the risk of casino gambling as a function of frequency in Australia (Browne et al., 2023). Sports betting accounted for the third highest proportion of those experiencing problem gambling in a population-representative survey in the USA (Mazar et al., 2020).

In a GB YouGov survey that assessed engagement in 23 gambling activities among 3000 sports bettors, excess gross expenditure on horse/dog racing and online sports betting was most common among those with PGSI 3+ (at least moderate risk of problem gambling) (Wardle et al., 2023), and in a longitudinal survey of 2000 GB young adults, reported online betting on horses and dogs was associated with increased PGSI scores one year later (Wardle & Tipping, 2023). Sports betting was the second most common activity among individuals receiving treatment for problem gambling, reported by 20% of participants (GambleAware, 2022). As a partial explanation for the correlation between sports betting and experiencing problem gambling, Phua et al. (2022) found that sports bettors report higher illusion of control and believe they are more likely to be lucky than non-sports bettors suggesting that they believe they have greater control over the outcome of their bets.

Type of sports betting should also be considered. Using custom sports betting products (defined as creating your own bets on specific sporting events) was associated with greater problem gambling severity, gambling harms, and gambling consumption (Newall et al., 2021) in a sample of 789 UK sports bettors, 489 who reported placing custom sports bets and 300 who did not. Based on these findings, the authors suggest that custom sports bets may require additional customer protection measures. However, the sample was recruited from a survey website, and participants had relatively high PGSI scores, suggesting they may not be representative of the general population who place custom bets. Further, there are several different types of custom bets, and research needs to determine whether they are associated with different levels of risk.

It is also important to consider the context in which people bet. For example, in a Swedish study conducted in May 2020 looking at past-year gambling among 1000 online gamblers, individuals who reported betting on sports during the height of the COVID-19 pandemic (when very little sports betting was available) had very high levels of gambling problems and indebtedness and gambled more (Hakansson, 2020). Those who maintain or initiate difficult-

to-access types of gambling appear to be a particularly vulnerable group, and hence safer gambling measures are needed to target these populations (Hakansson, 2020).

The impact of sports betting may vary by sport. In a national survey of over 40,000 people in Japan, which included almost 15,000 gamblers, those who engaged in auto racing, bicycle racing and boat racing were more likely to be classified as experiencing problem gambling than those who did not (Hayano et al., 2021). Those who gambled on auto racing had higher SOGS scores independent of number of gambling types participated in (Hayano et al., 2021). These findings likely relate to the frequency and popularity of these sports in Japan. However, horse racing, which is less popular amongst the Japanese general public, was associated with low-risk gambling in a small survey of 1000 participants conducted in a single region (Ino et al., 2020).

2.3.5.1. In-play sports betting

In-play betting refers to betting once a sports event has started and has increased in recent years (Gambling Commission, 2017). Across three studies ranging from approximately 500-1000 participants, recruited by market research companies, in Canada (Vieira et al., 2023), Spain (Lopez-Gonzalez et al., 2020) and Australia (Gainsbury et al., 2020; Lopez-Gonzalez et al., 2020), those who bet in-play reported higher PGSI scores than those who did not. Additionally, those who bet in-play endorsed greater gambling-related harms across all six domains (financial, emotional/psychological, health, relationships, work, and social deviance), and reported greater mental health and substance use difficulties relative to those who bet on single sports events and those who bet in a more traditional way on sports (Vieira et al., 2023). Across three large-scale population surveys in Iceland, individuals who participated in in-play betting were more likely to be classified as problem gamblers (Brosowski et al., 2021). However, in Sweden only in-play bettors who also engaged in online casino gambling (Hakansson & Widinghoff, 2020) were more likely to be classified as problem gamblers. These findings suggest that in-play betting is associated with greater harm than regular sports betting, likely because it enables high-speed continuous betting and requires rapid, impulsive decisions without reflection (e.g., Killick & Griffiths, 2018). Restrictions on in-play betting may therefore promote safer gambling. However, it is important to note that most of this research was conducted on a small scale, and further cross-sectional surveys, and longitudinal studies are needed to draw firmer conclusions.

2.3.6. Scratch cards

A study based on data from three cross-sectional Icelandic gambling surveys between 2007-2017, analysed using a complex model, revealed that individuals who engaged in scratch cards offline on foreign websites were more likely to be classified as experiencing problem gambling (Brosowski et al., 2021), and that greater frequency of scratch card gambling was associated with experiencing greater harm, suggesting that thresholds of low-risk gambling would be useful for scratch cards. Similarly, in a secondary analysis of data from population-representative surveys in Tasmania, Australia, 6.43% of those who gambled on scratch cards reported experiencing gambling-related harm, and exceeding low-risk limits of gambling expenditure significantly predicted gambling-related harm for instant scratch ticket gamblers (Dowling et al., 2022). Taken together these findings suggest that scratch cards pose some risk, though it appears to be considerably lower than for many other products.

2.3.7. Lottery

In GB, the lottery is the most common type of gambling. However, across countries the lottery appears to be a form of gambling least correlated with harm. The NGTS report, based on GB data, was notable for not mentioning lotteries, suggesting that they are associated with lower levels of harm than other types of gambling (GambleAware, 2022). Similarly, in population-representative surveys across the USA, Japan, and five European countries (France, Germany, Italy, Poland, Switzerland), lottery participants had the lowest scores on gambling screening questionnaires such as the PGSI and the SOGS (Costes et al., 2023; Hayano et al., 2021; Ino et al., 2020; Lelonek-Kuleta et al., 2020; Mazar et al., 2020). Similarly, in a study of approximately 7500 individuals who completed a screener for the Swedish National Gambling helpline (80% male), those who engaged in lotteries and horse betting had the lowest PGSI scores (Wall et al., 2021). In an aggregated dataset of gambling prevalence surveys from almost all Australian states, covering approximately 70,000 participants, lotteries had almost no association with gambling problems (Browne et al., 2023), and in a GB longitudinal study of 2000 young adults who bet on sports, lotteries were least dependent on revenues from those experiencing moderate risk or problematic gambling (Wardle et al., 2023).

Considering relative risk, in a Canadian survey consisting of over 10,000 participants, fewer individuals participating in lotteries and raffle tickets met the criteria for problem gambling than those participating in bingo, which is also considered a low-risk activity (Gooding & Williams, 2023). Similarly, GB data indicates that amongst adults who had gambled within the last 12 months, 5.8% had a PGSI score of 1+, indicative of engaging in at-risk or problem gambling (Gambling Commission, 2023), and this number rose to 7.9% when individuals who bet on the national lottery only were excluded. Taken together these findings suggest that lottery participating is low risk relative to most other types of gambling.

However, it is important to be aware that lotteries are associated with at least some level of harm. For example, in a nationally representative sample of 2000 Australian adults, 1/3 of individuals who bet exclusively on lotteries were at some risk of experiencing problematic gambling, with 4% meeting the PGSI criteria for problem gambling (Booth et al., 2020). Similarly, in a population-representative Australian survey, exceeding expenditure as a proportion of gross income significantly predicted gambling-related harm for individuals who gamble on lotteries (Dowling et al., 2022). Further, in a Canadian population survey consisting of over 20,000 respondents, instant lottery, and lottery/raffle ticket participation were associated with higher PGSI scores (Williams et al., 2021). Further, among those who used lotteries, men and younger people were more likely than other respondents to have higher PGSI scores (Booth et al., 2020). Previous research has shown that these groups tend to use lottery products more intensively (Costes et al., 2018). These findings suggest that lottery gamblers at risk of experiencing problem gambling have similar profiles to those at risk of experiencing problem gambling in general, and hence harm-minimisation efforts should be targeted at these particular groups. In addition, given the large numbers of individuals who take part in the lottery, even a small percentage experiencing harm is likely to translate into quite large numbers.

It is also important to consider the type of betting engaged in. Lottery games (betting on the outcome of a lottery, rather than buying lottery tickets) appear to be associated with greater risk of gambling harm. In a representative sample of almost 15,000 adults in the US (almost 6000 gamblers), individuals who participated monthly or more on daily lottery games had the fifth highest proportion of individuals experiencing problem gambling (Mazar et al., 2020).

Additional research into lottery games is needed, to determine whether they would benefit from additional regulation beyond that required for the lottery in general.

2.3.8. Bingo

In GB, bingo was the game that had the smallest share of GGY, with typically low spending levels, losses of on average 7.2 pence per minute, and low concentration of revenue (Forrest et al., 2022). Similarly, in a population-representative Australian survey, exceeding low-risk limits did not predict harm for bingo gamblers (Dowling et al., 2022). These findings suggest that bingo is the lowest risk of any type of gambling game. Limited studies assessed the risk of bingo, as many focused on online gambling. However, it is important to note that the relative harm of bingo might change now as it is increasingly being played online in isolation rather than with others in a land-based setting.

2.3.9. Overlap between video gaming and gambling

The lines between gambling and video gaming appear to be blurred. Esports betting (betting on the outcome of esports (video game) tournaments) was associated with high risk of harm in Australia (Greer et al., 2021) and GB (Zendle, 2020). An Australian cross-sectional survey of approximately 300 sports bettors and 300 esports bettors (Greer et al., 2021) found that PGSI scores were significantly higher for those betting on esports, and significantly more individuals who bet on esports were classified as experiencing problem gambling. After controlling for age and gender, esports betting was significantly associated with problem gambling severity and gambling-related harms, accounting for 15.3% of the variance in PGSI score and 9.6% of variance on the Short Gambling Harms Screen (Greer et al., 2021). A greater proportion of individuals who bet on esports were identifiably harmed, and those who bet on esports experienced more harms on average than those who bet on sports. Finally, greater frequency of esports skin betting (ESB) was significantly associated with higher PGSI scores (Greer et al., 2021). Similarly, a GB population-representative survey of over 1000 participants aged 18+ years found that engagement in esports was associated with experiencing both problem gambling and disordered gaming (Zendle, 2020). These findings tie in with research showing that esports bettors are more likely to gamble with greater intensity and on riskier activities (Gainsbury et al., 2017; Wardle et al., 2020). The relation between esports gambling and harm is complex; further research is needed to determine whether esports bettors experience harm on the way to becoming involved in esports or whether esports provide a pathway to traditional gambling. Either way, this is a significant issue, considering that esports skin betting is currently unregulated and thus both accessible and popular among children and adolescents in GB (Wardle, 2019).

It is important to consider the overlap between video gaming and gambling more broadly. In a GB survey engaging in game-related gambling, esports betting, social casino spending, real-money video gaming, token wagering, and loot box spending was significantly associated with experiencing both problem gambling and disordered gaming (Zendle, 2020). Longitudinally, in a survey of 2000 GB young adults aged 16-26 years, skin betting was strongly associated with increased PGSI scores one year later (Wardle & Tipping, 2023). These findings point to the complexity of the relation between gaming and gambling, suggesting that longitudinal research is warranted to investigate this relationship further, and that regulation of gaming should also be considered.

2.3.10. Other forms of gambling

In Iceland, individuals who engaged in poker were more likely to be classified as experiencing problem gambling (Brosowski et al., 2021). Other forms of gambling that have been associated with experiencing problem gambling include pachinko (Hayano et al., 2020; Ino et al., 2020), keno (a lottery-like gambling game in casinos) and pulltabs (similar to scratch card lottery tickets but involve pulling a tab to reveal whether the ticket is a winner) (Grubbs & Kraus, 2023). As these types of gambling are not common in the UK (excepting poker), they will not be discussed in detail.

2.4. Are there differences in risk between different types of gambling?

In conclusion, the results suggest that EGMs are associated with the greatest risk of harm, followed by casino gaming, and sports betting. Longitudinal studies indicate that EGMs and certain high-intensity gambling activities are associated with increased risk and severity of gambling harm over time. Within sports betting, in-play betting appears to be particularly high risk. Based on the evidence available, Esports betting was associated with greater harm than sports betting, in terms of problem gambling severity and gambling harms, although this may be partly because younger people (who are more likely to experience gambling harms) are more interested in esports. Given that this finding is based on one study, further research in needed to draw firmer conclusions. Lottery and bingo appear to be associated with the lowest level of harm among gambling products, although no type of gambling is without risk. Mixed gambling (on skill and chance games) appears to be associated with greater risk than either type of gambling alone, although skill games are associated with greater risk than expected, likely due to the chance elements they contain. Although gambling online was associated with greater risk of harm than gambling offline in some studies, due to differences between gambling products it is more important to compare products than modality of gambling. These findings underscore the importance of distinguishing between different types of gambling when considering their potential harm and the need for targeted interventions.

3. Phase 2 - Secondary Analyses: Overall Approach

To further stress-test and validate these findings within GB, we analysed data from the 40,502 respondents who gambled (PGSI 0+) among the 55,222 respondents in the Annual GB Treatment and Support (T&S) Survey[2] for 2020, 2021, and 2022. The T&S Survey study fieldwork was carried out using YouGov's online panel[3]. YouGov employs an active sampling method, drawing a sub-sample from its panel that is representative by socio-demographics (in this case, age; gender; region; National Readership Survey (NRS) social grade, and ethnic group). Respondents were automatically, randomly selected based on which surveys were 'live' at the time and how that matched their profile information. Respondents were contacted by email and invited to take part in an online survey. In total, 18,879 adults in GB were surveyed in 2020, including 2,294 PGSI 1+ gamblers, and 2,345 adults from BAME communities. 18,038 adults in GB were surveyed in 2021, including 2,338 PGSI 1+ gamblers. 8,305 adults in GB were surveyed in 2022, including 2,483 PGSI 1+.

[2] Please note these are not official statistics which can be found at the Gambling Commission website. GambleAware estimates are based on the latest treatment and support online survey conducted among over 55,222 people in GB aged 18+ with fieldwork carried out in 2020, 2021, and 2022 by YouGov. Surveys using other methods, including official surveys, generally lead to lower levels of estimated prevalence and therefore these figures may be seen as an upper bound.

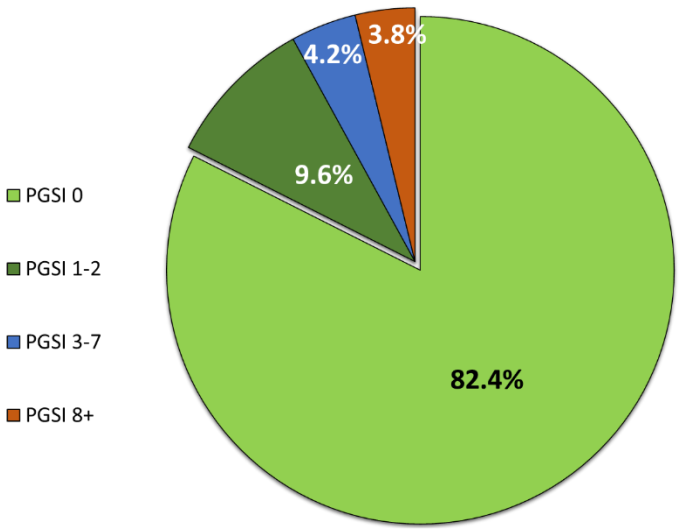
[3] Annual GB Treatment and Support Survey 2020. https://www.begambleaware.org/sites/default/files/2021-06/Annual_GB_Treatment_and_Support_Survey_2020_report_%28FINAL%29_26.03.21.pdf
Annual GB Treatment and Support Survey 2021. https://www.begambleaware.org/sites/default/files/2022-03/Annual%20GB%20Treatment%20and%20Support%20Survey%20Report%202021%20%28FINAL%29.pdf
Annual GB Treatment and Support Survey 2022. https://www.begambleaware.org/sites/default/files/2023-07/GambleAware%20Treatment%20and%20Support%20Report%20July%202022.pdf

Although online surveys such as this can lead to higher estimates of problems with gambling (Sturgis & Kuha, 2021) and this analysis is not attempting to estimate or reproduce prevalence at a population level, the size of this dataset presented a unique opportunity to look at the relative risk of individual gambling products. Table 1 shows the overall breakdown of PGSI score groupings (i.e., people experiencing different levels of problems with their gambling). Figure 2 shows the proportion of PGSI score groups.

Table 1. Breakdown of PGSI score groupings

PGSI score range	Number of participants	Proportion of PGSI score groupings
All people who have gambled in the last 12 months (PGSI 0+)	40,502	100%
People who gamble without experiencing any problems (PGSI 0)	33,387	82.4%
People experiencing a low level of problems with their gambling (PGSI 1-2)	3,883	9.6%
People experiencing a moderate level of problems with their gambling (PGSI 3-7)	1,693	4.2%
People experiencing 'problem gambling' (PGSI 8+)	1,539	3.8%
People experiencing any problems with their gambling (PGSI 1+)	7,115	17.6%

Figure 1. Prevalence of PGSI score groupings among those who gambled in the last 12 months



We grouped gambling activities into 3 broader categories (gaming, betting, lotteries), each consisting of individual types with notes about gambling modes (online, in-person, or both), in line with the definitions of the Gambling Commission[4], as shown in Table 2. This grouping allowed us to uncover and understand the relationship between gambling types and

[4] https://www.gamblingcommission.gov.uk/about-us/guide/page/definitions-of-terms

gambling problems. Data were weighted by YouGov based on age, gender, UK region, National Readership Survey (NRS) social grade and ethnic group, to make the sample representative of the overall GB adult population[5].

Loot boxes were not included within broad categories as they are not currently regulated by the Gambling Commission due to the current regulations stating "where in-game items obtained via loot boxes are confined for use within the game and cannot be cashed out it is unlikely to be caught as a licensable gambling activity" (Gambling Commission, 2017). However, research is growing in this area showing the gambling-like mechanics underlying loot boxes and a link with 'problem gambling' (Close et al., 2023).

Table 2. Gambling types and broader categories

Survey code (individual type)	Broad category	Mode
Tickets for the national lottery draw, including Thunderball and EuroMillions and tickets bought online	Lottery	Both
Tickets for any other lottery, including charity lotteries		Both
Gaming machines in bookmakers	Gaming	In-person
Fruit or slot machines		In-person
Gambling in a casino (any type)		In-person
Online casino games (slot machine style, roulette, instant wins)		Online
Online poker		Online
Scratch cards		Both
Bingo (including online)		Both
Betting on horse or dog races – online	Betting	Online
Betting on horse or dog races – in person		In-person
Betting on football – online		Online
Betting on football – in person		In-person
Betting on other sports – online		Online
Betting on other sports – in person		In-person
Loot boxes	-	Online
Any other type of gambling	-	Both
Don't know[6]	-	-
None of the above	-	-

Our secondary analyses aimed to examine the relative level of gambling problems, assessed by PGSI score groupings (PGSI 0, 1-2, 3-7, 8+, 1+), across various types of gambling activities that were included in the T&S Survey (as shown in Table 2). We included PGSI 1+ in the analyses to look at people experiencing any problems of gambling, including PGSI 1-2 which represents low but still existing risk if a person is heavily involved in gambling (Ferris & Wynne, 2001). This will provide a comprehensive understanding of the spectrum of gambling behaviours and compare the gambling products across the full range of relative problems. Our analyses consist of prevalence analyses of gambling problems experienced by individuals using different gambling products (Section 4.1), and a deep dive into each of the three broad gambling categories, gaming (Section 4.2), betting (Section 4.3) and lotteries (Section 4.4).

[5] For details, see footnote 3 links for YouGov's reports
[6] "Don't know" and "None of the above" were excluded from the grouped analyses.

Specifically, prevalence analyses mainly include: the prevalence of problems for each gambling type; the estimation of the number of people in GB experiencing any problems with gambling (PGSI 1+) and experiencing 'problem gambling' (PGSI 8+) for each gambling type; the relative level of problems experienced by people based on the number of gambling types they participated in; the relative level of problems based on the frequency of taking part of gambling; the prevalence of problems for bespoke group of activities (e.g., everything apart from those only taking part in the national lottery, everything apart from those only taking part in the lottery); and the prevalence of problems for each singular activity (e.g., only taking part in one gambling type). The deep dive in each broad gambling category (i.e., gaming, betting, and lottery) mainly includes the demographic analyses and behavioural analyses. Demographic analyses involve examining the distribution of demographic factors, such as age, gender, ethnicity, and religion, across different types of gambling within each broad gambling category. Additionally, we explored the associations between specific gambling activities and socio-demographic characteristics, helping to identify patterns and trends among different population groups. Behavioural analyses focus on understanding the motivations behind individuals' participation in gambling activities, as well as any changes in their gambling behaviour (assessed by time and money spent as reported in the T&S Survey) over the past 12 months, and the relative harm associated with different modes of gambling. This approach helps us characterise associations between variables from the dataset in a robust way and provide recommendations in a comprehensive manner, in relation to the relative harms associated with different types of gambling.

4. Phase 2 - Secondary Analyses: Results

4.1. Prevalence of problems by individual categories

4.1.1. Summary of key results

- **Gambling products most associated with problems:** Gaming machines in bookmakers exhibited the largest proportion (79%) of individuals experiencing any problems (PGSI 1+), followed by in-person betting on sports other than football or horse/dog racing (71%) and online casino games (63%). Similarly, gaming machines in bookmakers exhibited the largest proportion (50%) of 'problem gambling' (PGSI 8+), followed by in-person betting on other sports (36%) which was followed by gambling in a casino (any type) (26%).
- **Gambling products least associated with problems:** National lottery (19%) exhibited the smallest proportion of any problems, followed by other lotteries (19%). National lottery (3%) and other lotteries (5%) also exhibited the smallest proportion of 'problem gambling' (PGSI 8+).
- **Volume of problems by product:** The estimated number of people experiencing any problems (PGSI 1+) was the highest for the national lottery (4.2 million), scratch cards (2.6 million), and online betting on football (1.9 million). Likewise, the estimated number of people with 'problem gambling' was the highest for the national lottery (0.6 million), scratch cards (0.5 million) and online betting on football (0.4 million).
- **Link between number of activities and problems:** Overall, the more gambling activities an individual participated in, the more likely they were to experience higher level of problems.
- **Link between gambling frequency and problems:** For those who gambled at least once a week, the more frequently they gambled, the more likely they were to

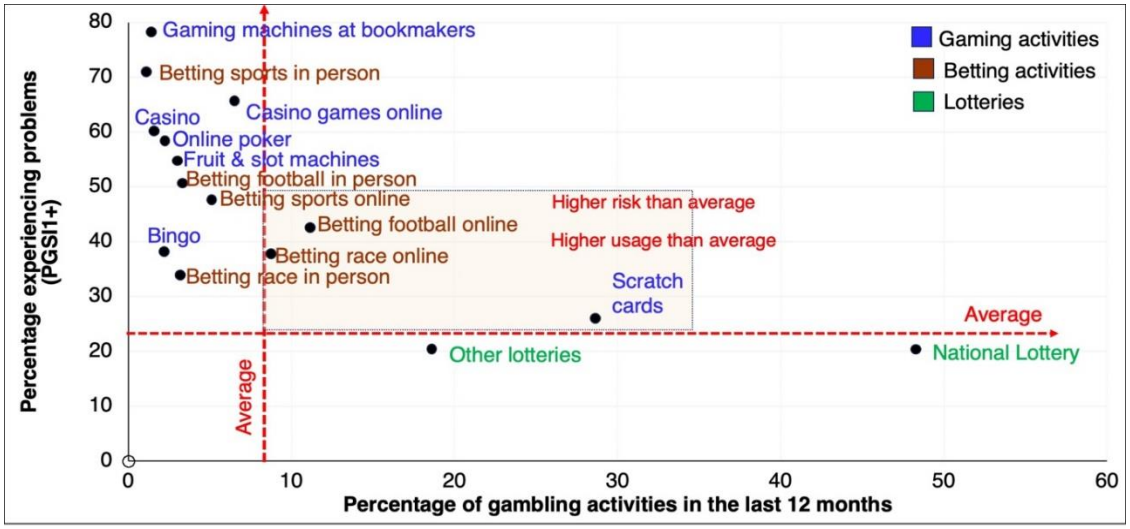
experience any problems; however, the prevalence of problems was higher among those who gambled once a fortnight, compared to those gambling once a week.

- **Most common gambling combinations:** The combinations of activities examined corroborate that lotteries and scratch cards were less harmful activities, as compared to other combinations. Those taking part only in national lottery and scratch cards had the largest proportion (81%) of people gambling with no reported problems (PGSI 0), and those who did not only take part in national or other lotteries exhibited the smallest proportion of people gambling without problems (65%).
- **Level of problems when only taking part in one product:** When isolating those who took part only in one activity, gaming machines in bookmakers exhibited the highest proportion of 'problem gambling' (PGSI 8+; 76%). For any problems (PGSI 1+), gaming machines in bookmakers still showed the highest proportion (85%), followed by online casino games (65%), and gambling in a casino (52%). Other lotteries (9%) and national lottery (10%) had the lowest proportion of problems, followed by in-person betting on horse or dog races (13%).
- **Level of problems among those gambling in last month:** When looking at the past 4 weeks, the pattern was similar regarding the prevalence of problems across individual gambling types. However, some activities saw an increase in prevalence of any problems (PGSI 1+) compared with the last 12 months, particularly, in-person betting on horse or dog races (48% vs 34%), fruit or slot machines (63% vs 53%), and gambling in a casino (68% vs 60%). Similarly, the top 3 activities with the biggest increase in prevalence of 'problem gambling' (PGSI 8+) compared with the last 12 months was in-person betting on horse or dog races (21% vs 11%), gaming machines in bookmakers (59% vs 50%), and gambling in a casino (35% vs 26%).

4.1.2. Last 12 months individual category vs average (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

When comparing various gambling types, we calculated "average" values to be used as a benchmark. Average refers to the value when all gambling activities regardless of types are taken into account. It provides a standard measure to compare individual or group performance against the overall performance. For example, knowing the average proportions of problems in gambling could help to identify which specific gambling type involves higher or lower level of problems compared to the average values. Amongst people who gambled in the past year, the proportion experiencing problems was greater than average for scratch cards (22%), betting on football online (44%), and betting on horse/dog races online (38%) (Figure 3).

Figure 3. The usage of gambling products and associated harm in the last 12 months



Base size: 40,502 respondents
Base size range: 301 (betting sports in person) and 23,700 (National lottery).

We examined the prevalence of problems (i.e., PGSI score groupings) in each individual gambling category in the last 12 months, with 100% stacked columns for each category to compare the contribution of each PGSI group to the total across all gambling categories.

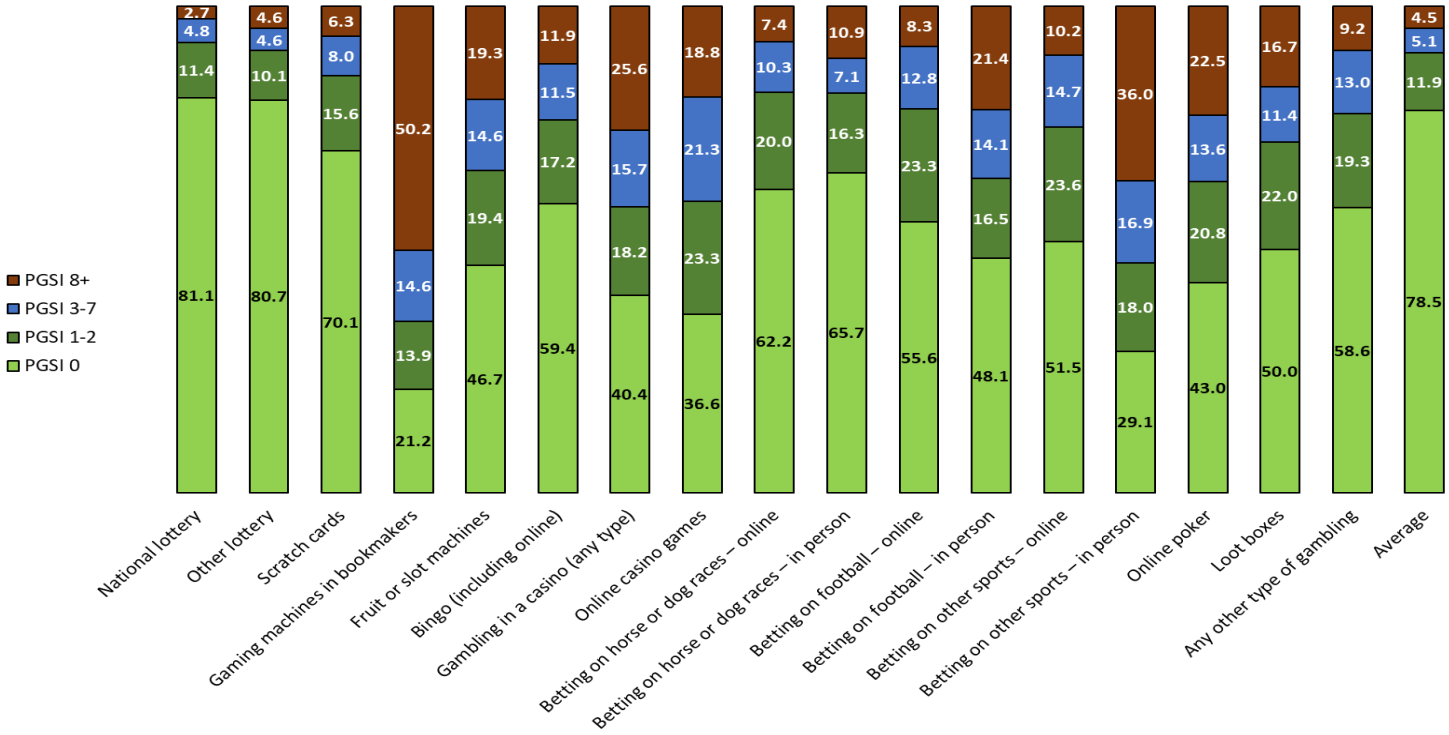
Table 3 and Figure 4 revealed that gaming machines in bookmakers exhibited the largest proportion (79%) of individuals experiencing any problems with their gambling (PGSI 1+) and the largest proportion (50%) experiencing 'problem gambling' (PGSI 8+), followed by in-person betting on other sports (71% PGSI 1+; 36% PGSI 8+). The next most concerning activities are gambling in a casino (60% PGSI 1+; 26% PGSI 8+) and online casinos (63% PGSI 1+; 19% PGSI 8+). In contrast, national and other lotteries exhibited the lowest prevalence of problems, as the proportion of non-problem gambling (PGSI 0) was the largest compared to the other gambling types (81% national lottery; 81% other lotteries).

Table 3. Prevalence (weighted %) of the PGSI score groupings by the individual gambling types during the past 12 months

PGSI score groupings	National lottery	Other lottery	Scratch cards	Gaming machines in bookmakers	Fruit or slot machines	Bingo (including online)	Gambling in a casino (any type)	Online casino games	Betting on horse or dog races – online	Betting on horse or dog races – in person	Betting on football – online	Betting on football – in person	Betting on other sports – online	Betting on other sports – in person	Online poker	Loot boxes	Any other type of gambling	Average*
PGSI 0	81.1	80.7	70.1	21.2	46.7	59.4	40.4	36.6	62.2	65.7	55.6	48.1	51.5	29.1	43.0	50.0	58.6	78.5
PGSI 1-2	11.4	10.1	15.6	13.9	19.4	17.2	18.2	23.3	20.0	16.3	23.3	16.5	23.6	18.0	20.8	22.0	19.3	11.9
PGSI 3-7	4.8	4.6	8.0	14.6	14.6	11.5	15.7	21.3	10.3	7.1	12.8	14.1	14.7	16.9	13.6	11.4	13.0	5.1
PGSI 8+	2.7	4.6	6.3	50.2	19.3	11.9	25.6	18.8	7.4	10.9	8.3	21.4	10.2	36.0	22.5	16.7	9.2	4.5
NET: 1+	18.9	19.3	29.9	78.8	53.3	40.6	59.6	63.4	37.8	34.3	44.4	51.9	48.5	70.9	57.0	50.0	41.4	21.5
Base	23700	7603	9323	570	1361	2197	747	2036	3158	1230	4540	768	1965	301	399	264	855	32147

**average: prevalence of PGSI groups across gambling categories among those participating in one or more gambling activities in the last 12 months.*

Figure 2. Distribution of PGSI groups (weighted %) in each individual gambling type during the past 12 months



**average: prevalence of PGSI groups across gambling categories among those participating in one or more gambling activities in the last 12 months.*

We further investigated relative risk of problems for each gambling type based on: (i) the number of people participating in this activity, (ii) the number of people participating in other activities, (iii) the number of those experiencing any problems (PGSI 1+) in this activity, and (iv) the number of those experiencing any problems in other activities. The relative risk of any problems (i.e., risk ratio) for each activity is shown in Table 4. National lottery, other lotteries and scratch cards involved lower relative risk of harm compared to other activities. There is a statistically significant association between relative risk of harm and activity participation. Overall, the higher the percentage of people participating in an activity, the lower relative risk of harm the activity has. However, this is not always the case. For example, gaming machines in bookmakers had both a higher percentage of participation and higher relative risk of harm compared to in-person betting on other sports and online poker.

Table 4. Relative risk of problems and percentage of participation of the individual gambling types during the past 12 month

	National lottery	Other lottery	Scratch cards	Gaming machines in bookmakers	Fruit or slot machines	Bingo (including online)	Gambling in a casino (any type)	Online casino games	Betting on horse or dog races – online	Betting on horse or dog races – in person	Betting on football – online	Betting on football – in person	Betting on other sports – online	Betting on other sports – in person	Online poker	Loot boxes	Any other type of gambling
Risk Ratio*	0.51	0.61	0.99	2.65	1.80	1.37	2.00	2.19	1.27	1.14	1.53	1.74	1.64	2.37	1.90	1.66	1.38
Percentage of Participation	43.3%	14.0%	16.6%	1.0%	2.4%	3.9%	1.3%	3.6%	5.7%	2.3%	8.2%	1.4%	3.6%	0.5%	0.7%	0.5%	1.5%

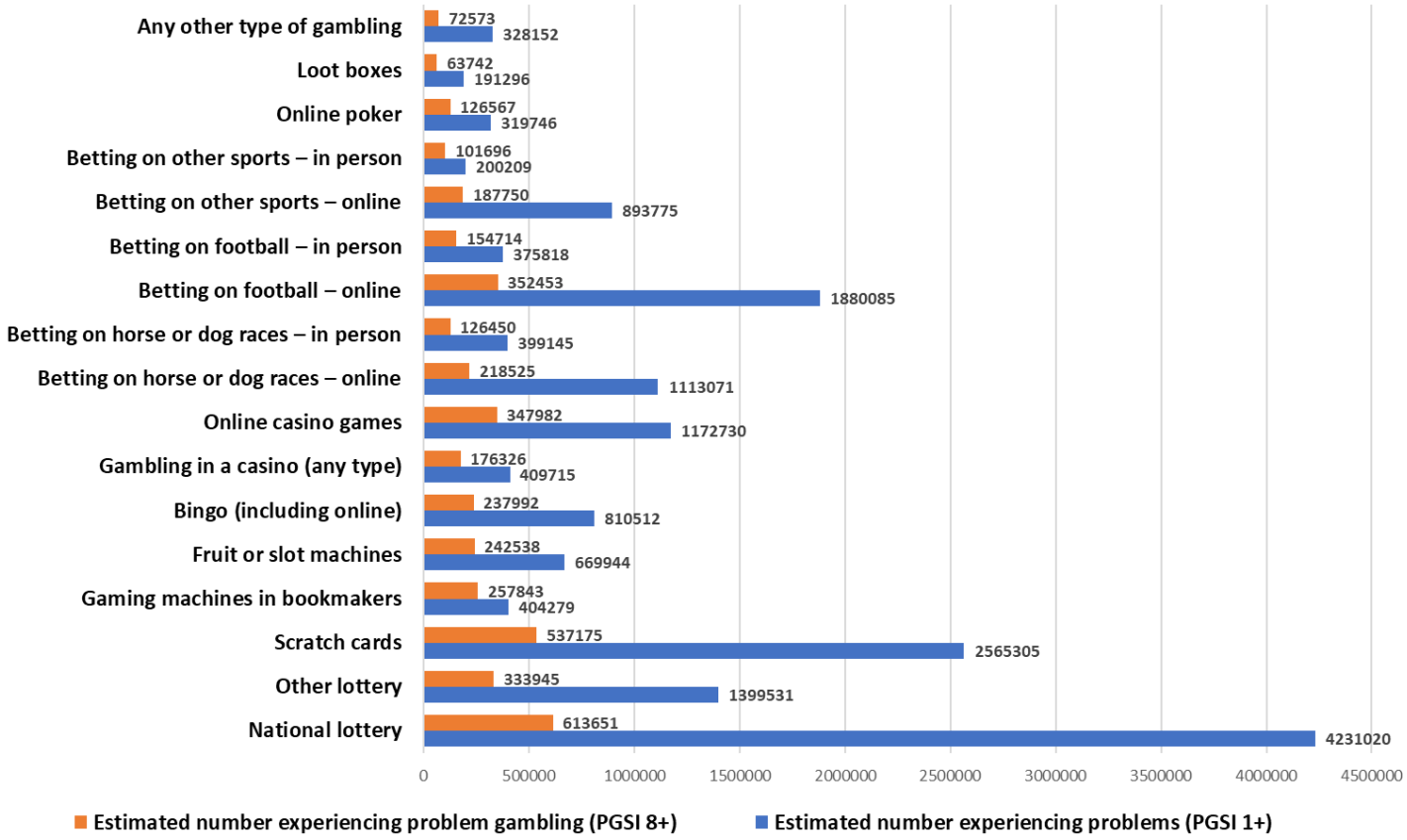
**Risk Ratio > 1 indicates increased relative risk of problems; Risk Ratio < 1 indicates decreased relative risk of problems.*

We also estimated the number of people experiencing any problems with gambling (PGSI 1+) and experiencing 'problem gambling' (PGSI 8+) in GB, based on the surveyed sample

size[7] and the ONS population figure[8]. As shown in Figure 5, the estimated number of people experiencing any problems is the largest for national lottery (4.23 million), scratch cards (2.57 million), and online betting on football (1.88 million), but smallest for loot boxes (0.19 million), in-person betting on other sports (0.20 million), and online poker (0.32 million).

For people experiencing 'problem gambling', the top 3 activities with the highest number are the same, i.e., national lottery (0.61 million), scratch cards (0.54 million), and online betting on football (0.35 million). The estimated number is lowest for loot boxes (0.06 million), any other type of gambling (0.07 million), and in-person betting on other sports (0.10 million).

Figure 3. The estimated number of people experiencing any problems with their gambling (PGSI 1+) and those experiencing 'problem gambling' (PGSI 8+)



4.1.3. Number of activities vs average (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

We examined the prevalence of gambling problems by number of activities an individual has taken part in the last 12 months. Table 5 and Figure 6 revealed that the more activities an individual took part in, the more likely they were to experience higher level of problems. Taking part in more than 5 activities was associated with the highest likelihood of all levels of gambling problems (53% PGSI 1+) as well as the highest likelihood of 'problem gambling' (13% PGSI 8+), compared to taking part in 5 or fewer activities.

[7]Wave 1 (2020) data was missing for loot boxes and online poker, so estimation for these two activities was based on the sample size of Wave 2 and Wave 3 (2021 and 2022).

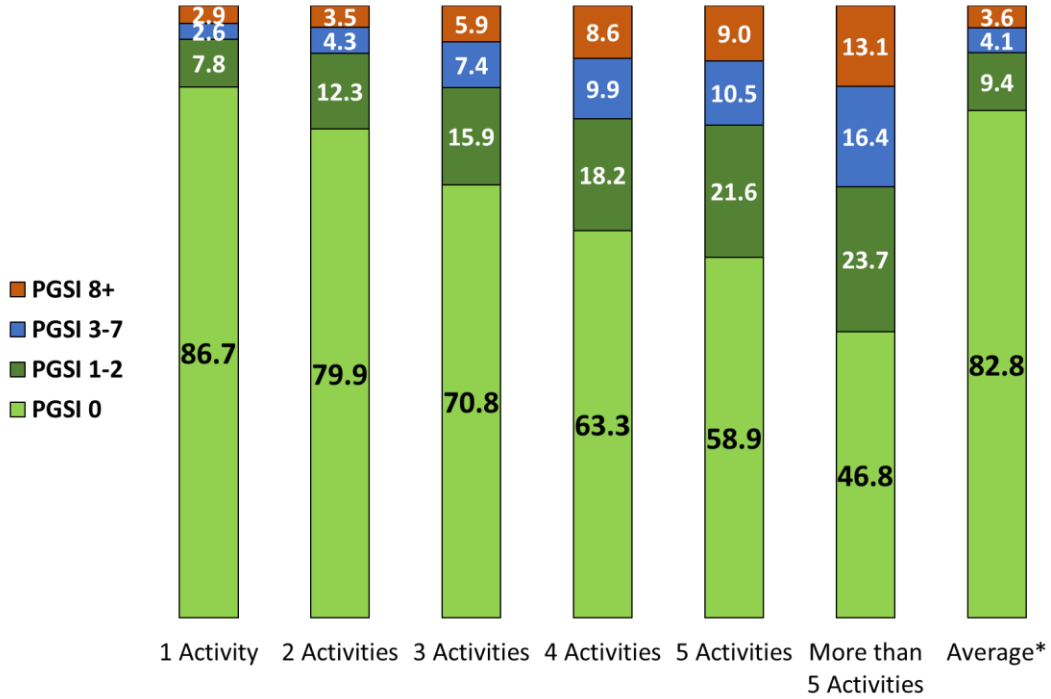
[8] Based on the figure for adult population in GB (51,718,632 in GB aged 18+ using 2021 mid estimates) divided by the survey sample (55,222) to scale up the (weighted) number of individuals experiencing each level of reported problems with gambling in the individuals in the sample taking part in each type of gambling. Population estimates for the UK, England, Wales, Scotland and Northern Ireland - Office for National Statistics accessed via https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/mid2021

Table 5. Prevalence (weighted %) of the PGSI groups by number of activities during the past 12 months

PGSI score groupings	Number of activities						
	1	2	3	4	5	More than 5	Average*
PGSI 0	86.7	79.9	70.8	63.3	58.9	46.8	82.8
PGSI 1-2	7.8	12.3	15.9	18.2	21.6	23.7	9.5
PGSI 3-7	2.6	4.3	7.4	9.9	10.5	16.4	4.1
PGSI 8+	2.9	3.5	5.9	8.6	9.0	13.2	3.6
NET: 1+	13.3	20.1	29.2	36.7	41.1	53.2	17.2
Base	15856	7864	3348	1721	1130	2228	40502

**average: prevalence of PGSI groups among all who gamble including those participating in 0 activity in the last 12 months*

Figure 4. Distribution of PGSI groups (weighted %) by number of activities in the past 12 months



**average: prevalence of PGSI groups among all who gamble including those participating in 0 activity in the last 12 months*

4.1.4. Frequency of gambling vs average (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

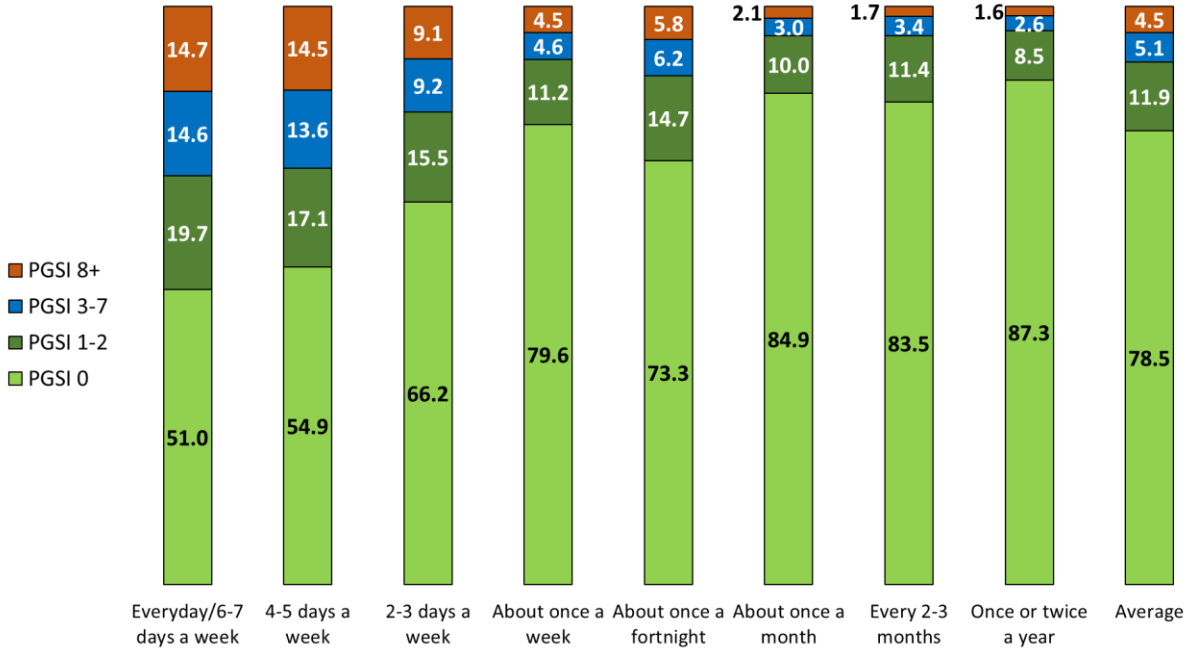
When examining the prevalence of problems by frequency of gambling, we found that the more frequently people gambled, the more likely they were to experience any problems (PGSI 1+); however, this applied only to those who gambled once a week or more frequently. For those who gambled once a fortnight (27%), the prevalence of any problems was higher than that among those gambling once a week (20%). The prevalence of problems became lower in those gambling once a month (15%), and then remained at a similar level for those gambling less frequently. Details are shown in Table 6 and Figure 7.

Table 6. Prevalence (weighted %) of the PGSI groups by frequency of gambling

PGSI score groupings	Frequency of gambling								
	Everyday/6-7 days a week	4-5 days a week	2-3 days a week	About once a week	About once a fortnight	About once a month	Every 2-3 months	Once or twice a year	Average*
PGSI 0	51.0	54.9	66.2	79.6	73.3	84.9	83.5	87.3	78.4
PGSI 1-2	19.7	17.1	15.5	11.2	14.7	10.0	11.4	8.5	11.9
PGSI 3-7	14.6	13.6	9.2	4.6	6.2	3.0	3.4	2.6	5.1
PGSI 8+	14.7	14.5	9.1	4.5	5.8	2.1	1.7	1.6	4.6
NET: 1+	49.0	45.1	33.8	20.4	26.7	15.1	16.5	12.7	21.6
Base	864	1127	3952	8072	2891	5793	4202	5287	32188

**average: prevalence of PGSI groups across gambling categories among those who answered this question about frequency of spending money on gambling.*

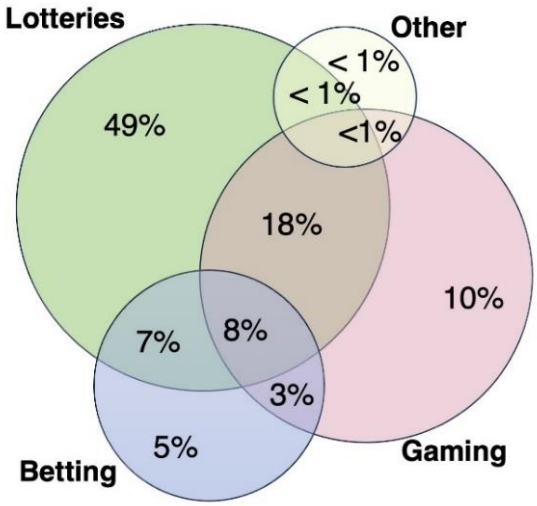
Figure 5. Distribution of PGSI groups (weighted %) by frequency of gambling



4.1.5. Bespoke group of activity vs average (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

Within the entire cohort surveyed, 58% reported having partaken in at least one of the gambling activities listed in Table 2 (including “loot boxes” and “any other type of gambling”) in the preceding 12 months. Among these individuals, the patterns of gambling engagement are multifaceted, indicating a tendency to participate in multiple forms of activities. Nevertheless, among the three broad gambling categories, a significant proportion of those who gambled in the last year (39%) participated in lotteries only. In contrast, the percentage of individuals who solely engaged in gaming or betting activities was comparatively smaller (Figure 8).

Figure 8. Engagement in the broad gambling categories in the last 12 months



How to read this diagram
Amongst all people indicating engagement at least in one gambling activity:
49% engage in lotteries only
7% engage in lotteries and betting
8% engage in lotteries, betting and gaming
3% engage in gaming and betting
10% engage in gaming only
4% engage in betting only
18% engage in lotteries and gaming

Engaging in Other gambling activities including Loot boxes is small (1% in total).

N total = 32,188	*Lotteries*	*Gaming*	*Betting*	*Other*	
Lotteries	15,714				
Gaming	5,718	3,155			2,451
Betting	2,375	893	1,603		
Other	170	58	51		

Given the high volume and low risk with regard to the national lottery, we also examined the prevalence of PGSI score groupings by several common combinations of activities to help reveal the impact on the overall prevalence of gambling problems, including:

1. everything except those taking part only in the national lottery
2. everything except those taking part only in lotteries (national lottery and/or other lotteries)
3. those who participated in national lottery and betting on football online only
4. those who participated in national lottery and scratch cards only
5. those who participated in national lottery, scratch cards and online betting on football only

All these combinations, except for "national lottery and scratch cards", exhibited higher prevalence of problems (PGSI 1+) compared with the average benchmark, as shown in Table 7. The prevalence was the highest among those who did not take part only in lotteries (36%), followed by the combination of national lottery, scratch cards, and betting on football online (35%), and the combination of national lottery and betting on football online (32%).

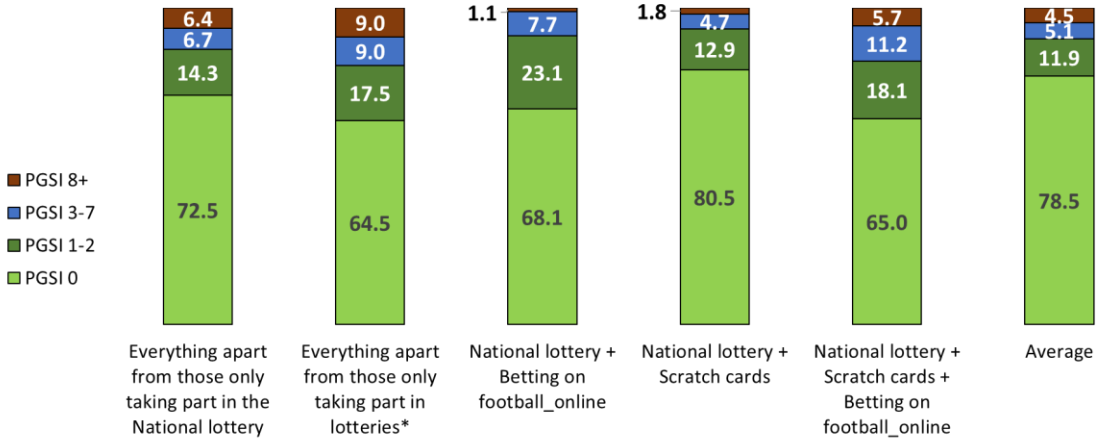
Similarly, as shown in Figure 9, among the bespoke groups examined, the prevalence of 'problem gambling' (PGSI 8+) was the highest among those who did not participate only in lotteries (9%), followed by the those who did not take part only in the national lottery (6%), and the combination of national lottery, scratch cards, and betting on football online (6%). When comparing to the average benchmark for 'problem gambling' (5%), this indicates how the lotteries were making the rate of 'problem gambling' among those who gambled much lower than it actually was, given that those who gambled on the national lottery only were exceptionally low-risk and high in volume.

Table 7. Prevalence (weighted %) of the PGSI groups by combination of activities during the past 12 months

PGSI score groupings	Combination of activities					
	Apart from those only taking part in the National lottery	Apart from those only taking part in the lottery[1]	National lottery + Betting on football online	National lottery + Scratch cards	National lottery + Scratch cards + Betting on football online	Average[2]
PGSI 0	72.5	64.5	68.1	80.5	65.0	78.5
PGSI 1-2	14.3	17.4	23.1	12.9	18.1	11.9
PGSI 3-7	6.7	9.0	7.7	4.7	11.2	5.1
PGSI 8+	6.4	9.0	1.1	1.8	5.7	4.6
NET: 1+	27.5	35.5	31.9	19.5	35.0	21.5
Base	20947	12798	342	2749	182	32147

[1]*including national lottery and other lotteries*
[2]*average: average prevalence of PGSI groups across gambling categories among those participating in one or more gambling activities in the last 12 months.*

Figure 6. Distribution of PGSI groups (weighted %) by combination of activities in the past 12 months



** including national lottery and other lotteries*

4.1.6. Singular activity (only taking part in one specific activity) vs average (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

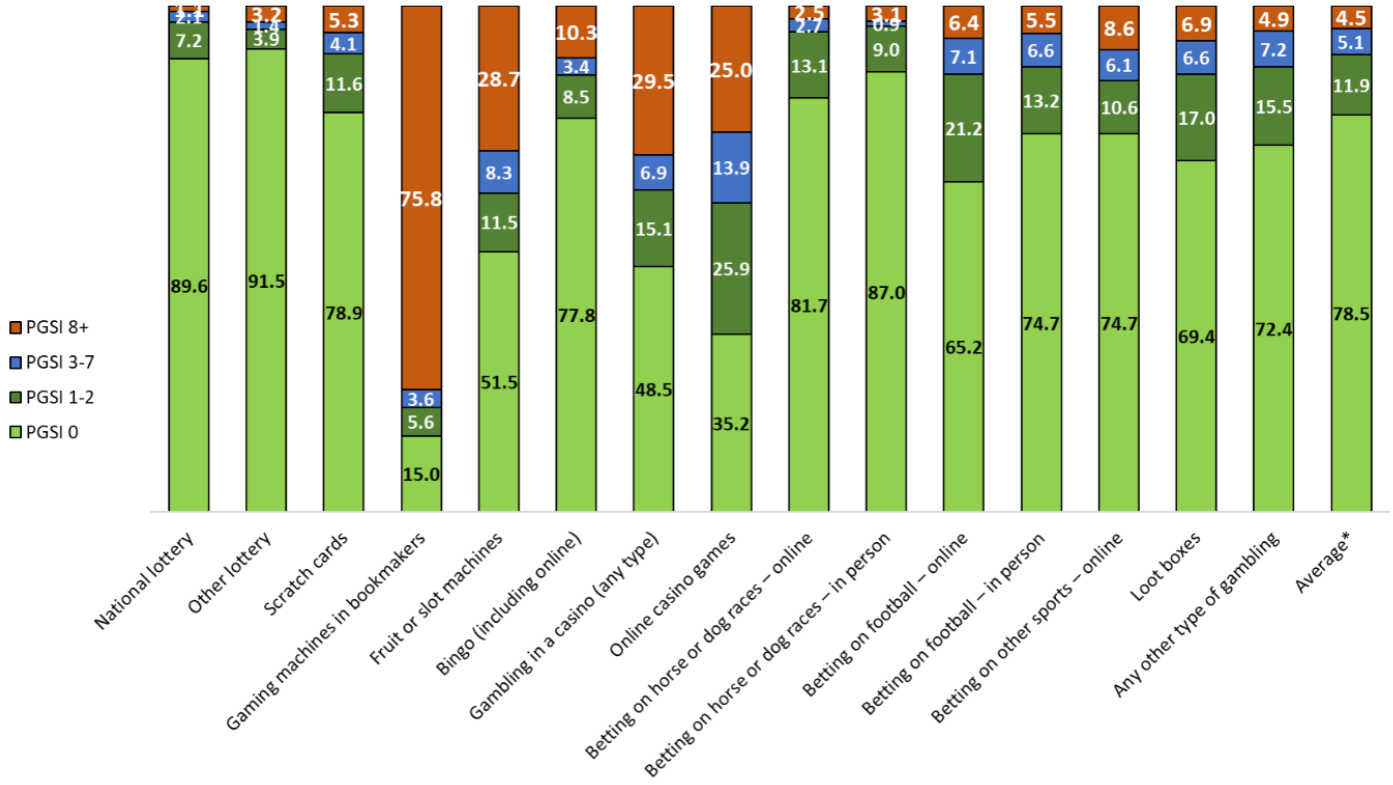
We further examined prevalence of problems among those who took part in only one gambling activity (i.e., singular activity). We excluded in-person betting on other sports and online poker from this analysis due to low sample size (i.e., the number of individuals who engaged in one gambling type only was less than 30, for both in-person betting on other sports and online pokers). As shown in Table 8 and Figure 10, gaming machines in bookmakers exhibited the highest proportion of those experiencing 'problem gambling' (76%), followed by gambling in a casino (30%) and fruit or slot machines (29%). Regarding any level of problems (PGSI 1+), in addition to gaming machines in bookmakers (85%), online casino games (65%), and gambling in a casino (52%) showed the second and third highest proportion of any problems, respectively. Other lotteries (9%) and national lottery (10%) exhibited the lowest proportion of problems, followed by in-person betting on horse or dog races (13%).

Table 8. Prevalence (weighted %) of the PGSI score groupings by singular activities during the past 12 months.

PGSI score groupings	National lottery	Other lottery	Scratch cards	Gaming machines in bookmakers	Fruit or slot machines	Bingo (including online)	Gambling in a casino (any type)	Online casino games	Betting on horse or dog races – online	Betting on horse or dog races – in person	Betting on football – online	Betting on football – in person	Betting on other sports – online	Loot boxes	Any other type of gambling	Average*
PGSI 0	89.6	91.5	78.9	15.0	51.5	77.8	48.5	35.2	81.7	87.0	65.2	74.7	74.7	69.4	72.4	78.5
PGSI 1-2	7.2	3.9	11.6	5.6	11.5	8.5	15.1	25.9	13.1	9.0	21.2	13.2	10.6	17.0	15.5	11.9
PGSI 3-7	2.1	1.4	4.1	3.6	8.3	3.4	6.9	13.9	2.7	0.9	7.1	6.6	6.1	6.6	7.2	5.1
PGSI 8+	1.1	3.2	5.3	75.8	28.7	10.3	29.5	25.0	2.5	3.1	6.4	5.5	8.6	6.9	4.9	4.5
NET: 1+	10.4	8.5	21.1	85.0	48.5	22.2	51.5	64.8	18.3	13.0	34.8	25.3	25.3	30.6	27.6	21.5
Base	11155	1766	1876	48	158	289	64	130	215	147	534	31	103	71	236	32147

**average: prevalence of PGSI groups across gambling categories among those participating in one or more gambling activities in the last 12 months.*

Figure 7. Distribution of PGSI groups (weighted %) by singular activities during the past 12 months



**average: prevalence of PGSI groups across gambling categories among those participating in one or more gambling activities in the last 12 months.*

4.1.7. Last 4 weeks individual category vs average (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

In addition, we examined the prevalence of 'problem gambling' by individual gambling category in the last 4 weeks (see Table 9 and Figure 11). Consistent with findings from the past 12 months, gaming machines in bookmakers exhibited the largest proportion (82%) of any problems (PGSI 1+) and the largest proportion (59%) of 'problem gambling' (PGSI 8+), followed by in-person betting on other sports (79% PGSI 1+; 41% PGSI 8+). In contrast, national and other lotteries exhibited the lowest level of harm, as the proportion of non-problem gambling (PGSI 0) was the largest among the two activities compared to the others

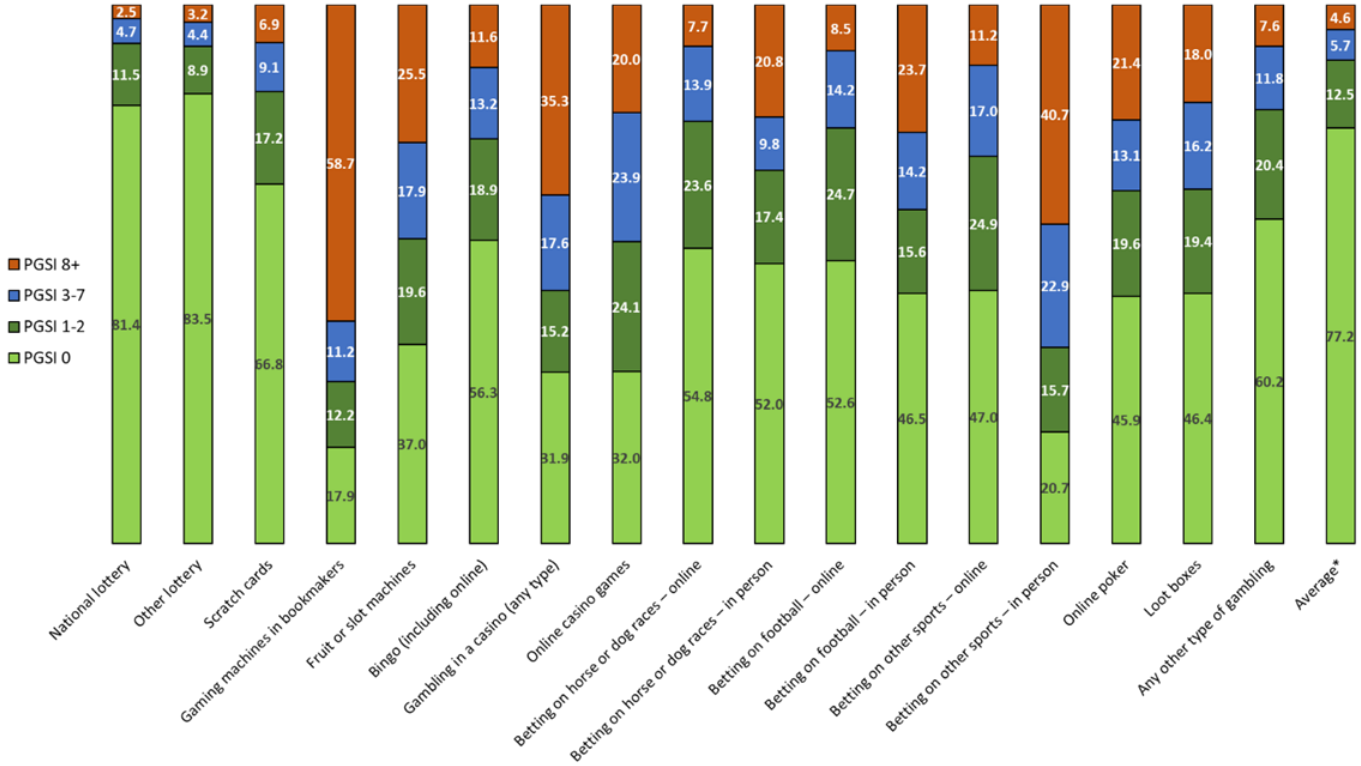
(81% national lottery; 84% other lotteries). The average prevalence of problems at any level (PGSI 1+) in the last 4 weeks (23%) was also similar compared to the last 12 months (22%).

Table 9. Prevalence (weighted %) of the PGSI score groupings by the individual gambling types during the past 4 weeks

PGSI score groupings	National lottery	Other lottery	Scratch cards	Gaming machines in bookmakers	Fruit or slot machines	Bingo (including online)	Gambling in a casino (any type)	Online casino games	Betting on horse or dog races – online	Betting on horse or dog races – in person	Betting on football – online	Betting on football – in person	Betting on other sports – online	Betting on other sports – in person	Online poker	Loot boxes	Any other type of gambling	Average*
PGSI 0	81.4	83.5	66.8	17.9	37	56.3	31.9	32	54.8	52	52.6	46.5	47	20.7	45.9	46.4	60.2	77.2
PGSI 1-2	11.5	8.9	17.2	12.2	19.6	18.9	15.2	24.1	23.6	17.4	24.7	15.6	24.9	15.7	19.6	19.4	20.4	12.5
PGSI 3-7	4.7	4.4	9.1	11.2	17.9	13.2	17.6	23.9	13.9	9.8	14.2	14.2	17	22.9	13.1	16.2	11.8	5.7
PGSI 8+	2.5	3.2	6.9	58.7	25.5	11.6	35.3	20.0	7.7	20.8	8.5	23.7	11.2	40.7	21.4	18.0	7.6	4.6
NET: 1+	18.6	16.5	33.2	82.1	63	43.7	68.1	68	45.2	48	47.4	53.5	53	79.3	54.1	53.6	39.8	22.8
Base	17684	5156	4626	206	459	1003	221	1137	1381	336	3016	320	908	112	171	106	445	24922

**average: prevalence of PGSI groups across gambling categories among those participating in one or more gambling activities in the last 4 weeks.*

Figure 8. Distribution of PGSI groups (weighted %) in each individual gambling type in the last 4 weeks



**average: prevalence of PGSI groups across gambling categories among those participating in one or more gambling activities in the last 4 weeks.*

However, some activities saw an increase in prevalence of any problems (PGSI 1+) in the past 4 weeks, with the top 3 activities being in-person betting on horse or dog races (48% vs 34%), fruit or slot machines (63% vs 53%), and gambling in a casino (68% vs 60%). The three activities with the biggest increase in prevalence of 'problem gambling' (PGSI 8+) were in-person betting on horse or dog races (21% vs 11%), gaming machines in bookmakers (59% vs 50%), and gambling in a casino (35% vs 26%). All of these are in-person gambling activities.
910

4.2. Deep dive among gaming products

Gaming products include gaming machines in bookmakers, fruit or slot machines, gambling in a casino (any type), online casino games (slot machine style, roulette, instant wins), online poker, scratch cards, bingo (including online), as shown in Table 2.

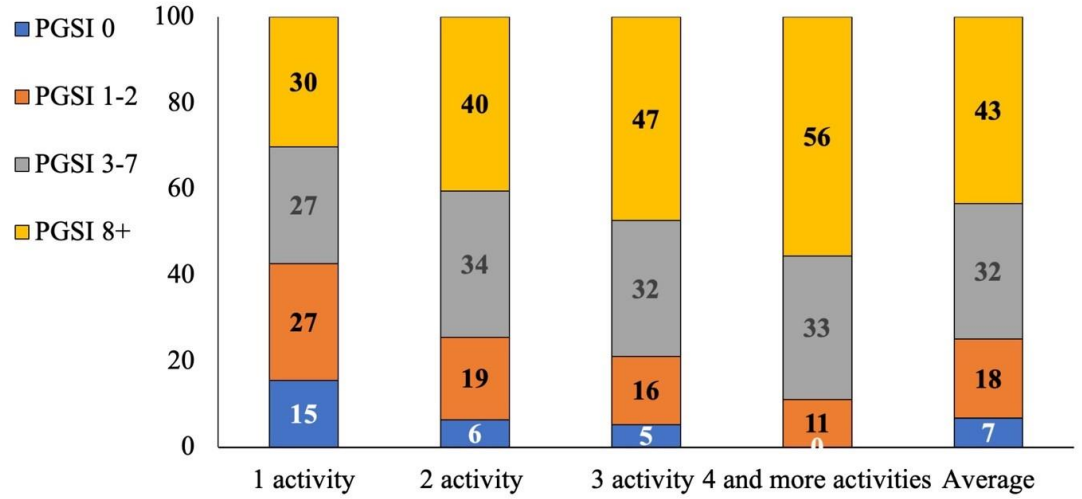
4.2.1. Summary of key results

- **Overall prevalence of problems within gaming:** Among those participating in any gaming activities 41% were experiencing any problems with their gambling (PGSI 1+) and 12% were experiencing 'problem gambling' (PGSI 8+).
- **Engagement in gaming activities and level of problems:** Individuals experiencing 'problem gambling' (PGSI 8+) were most likely to participate in at least one gaming activity (28%) compared to those with no reported problems (PGSI 0). Experiencing increasing level of problems was associated with engagement in more gaming activities.
- **Differences in gaming activities by demographics:**
    - Divorced, married, or separated individuals earning £20,000-£39,000 showed lesser engagement in online poker, fruit/slot machines, online casinos, and scratch cards.
    - Of those using gaming machines in bookmakers or gambling in casinos, 57% were young adults (18–34 years old). Older adults (55+) were less likely to participate in online or in-person casino games, online poker, or gaming machines in bookmakers.
    - Women were mainly attracted by bingo and scratch cards. Online poker and gaming machines in bookmakers were more popular among men.
- **Differences in motivations for different gaming activities:** Engagement in scratch card was primarily driven by the chance to win money, whereas those engaging in bingo sought fun and excitement. In-person gaming, particularly with bookmaker gaming machines, was motivated by desires for money, winning, fun, excitement, and boredom relief. Online gaming motivations included fun, profit, achievement, and excitement, with online poker participants also drawn by the challenge.
- **Frequency within gaming activities and change over the last 12 months:** Most scratch card and bingo participants gambled weekly, with similar spending patterns for both. Around a quarter cut back on their spending and time spent on these gaming activities over the last year. 23% of participants who engaged in in-person gaming weekly, and 20% 2-3 times per week, with equal numbers reporting reduced and increased spending, while half stayed the same. Online gaming frequency, including poker and casino games, mirrored that of in-person gaming. However, the increase in spending and time on scratch cards and bingo was nearly double compared to lotteries, indicating a rising interest in these games.

4.2.2. Engagement in number of gaming activities and problems (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

On average, 48% of individuals experiencing 'problem gambling' (PGSI 8+) were likely to engage in more than at least two gaming activities. In contrast, only 4% of people with no reported problems (PGSI 0) were likely to do so. The tendency to use two or more gaming products gradually diminished as the level of gambling problems decreased (Figure 12).

Figure 11. The proportion of people who engaged in gaming activities and PGSI score groupings in the last 12 months.



4.2.3. Demographics in broad and individual categories (age, gender, ethnicity, religion, etc.)

Table 10 presents the percentage of individuals participating in gaming activities within different age groups. For instance, 57% of those using gaming machines in bookmakers or engaging in in-person casino gaming fall within the young adult category, aged between 18 and 34. On average, individuals aged 55 and above were 3.4 times less likely to participate in gaming activities compared to young adults (18–34 years old) and 2.8 times less likely compared to middle-aged individuals.

The majority of gaming participants were heterosexual individuals (83%) or employed (77%). Women were more inclined towards bingo and scratch cards, whereas men were more attracted by online poker and gaming machines in bookmakers. Gaming activity preferences did not significantly vary across social grades.

As shown in the 2022 T&S Survey[9] about ethnicity, we used the following categories for ethnicity to help increase the robustness of comparisons due to larger sample sizes. However, the authors acknowledge that future studies should look to further separate out ethnicities to provide more nuanced analyses:

- Black (including mixed white/Black), which includes Black African/Mixed White/Black African, Black Caribbean/Mixed White/Black Caribbean, and Other Black/African/Caribbean;
- Asian (including mixed white/Asian), which includes Mixed White/Asian, Bangladeshi, Chinese, Indian, Pakistani, and Other Asian;
- White, which includes White British, Irish, Gypsy or Irish Traveller, and Any other White background.10

[9] Annual GB Treatment and Support Survey 2022 (Page 16). https://www.begambleaware.org/sites/default/files/2023-07/GambleAware%20Treatment%20and%20Support%20Report%20July%202022.pdf

Table 11. Socio-economic and demographic characteristics of people taking part in gaming activities in the last 12 months

	Scratch cards	Bingo	Fruit or slot machines	Gaming machines at bookmakers	Casino in person	Online casino games	Online poker	NET: any gaming	% among gambling	% among population
Age										
18-34	33%	38%	40%	58%	57%	44%	45%	45%	27%	29%
35-54	43%	40%	43%	35%	33%	45%	43%	40%	37%	35%
55+	24%	22%	17%	8%	11%	11%	14%	16%	36%	35%
Religion										
No religion	51%	53%	52%	36%	54%	60%	54%	51%	54%	42%
Any religions	41%	45%	47%	58%	43%	37%	43%	45%	43%	53%
Gender										
Males	57%	32%	58%	72%	65%	59%	76%	60%	49%	47%
Females	44%	68%	42%	30%	35%	41%	25%	41%	51%	53%
Gender ratio*	1.3	0.5	1.4	2.4	1.9	1.4	3.2	1.7	0.9	0.9
Social grade										
A+B	13%	12%	14%	17%	18%	14%	15%	14%	18%	16%
C1	19%	16%	18%	19%	19%	20%	20%	19%	22%	20%
C2	16%	16%	13%	14%	10%	15%	9%	13%	15%	13%
D+E	19%	19%	16%	17%	12%	17%	13%	15%	18%	17%
Education										
A-level	22%	23%	25%	24%	28%	25%	25%	24%	20%	20%
Degree	32%	28%	31%	34%	40%	33%	39%	35%	37%	38%
GCSE	17%	20%	16%	16%	12%	16%	11%	16%	15%	14%
Other	24%	25%	24%	22%	20%	23%	25%	23%	29%	28%
Gross-household per year										
Up to £20,000	20%	22%	19%	20%	16%	19%	17%	20%	19%	19%
£20,000-£39,000	27%	29%	30%	31%	26%	28%	31%	29%	27%	26%
£40,000-£59,000	17%	17%	16%	18%	18%	18%	19%	17%	15%	15%
£60,000 and above	13%	11%	16%	14%	20%	16%	18%	15%	14%	14%
Marital status										
Civil partnership	1%	2%	3%	4%	5%	2%	4%	3%	1%	1%
Divorced	7%	7%	4%	3%	4%	4%	8%	6%	6%	6%
Living as married or married	57%	51%	55%	47%	59%	50%	47%	51%	57%	56%
Never married	32%	34%	36%	41%	41%	40%	40%	38%	30%	31%
Separated	2%	2%	3%	2%	1%	2%	2%	3%	2%	2%
Widowed	2%	4%	4%	2%	1%	2%	1%	2%	4%	4%
Employment										
Retired	14%	15%	10%	6%	6%	6%	8%	9%	25%	24%
Student	4%	5%	8%	8%	7%	5%	5%	6%	5%	6%
Unemployed	9%	8%	8%	9%	6%	10%	6%	9%	6%	11%
Working	74%	72%	76%	77%	81%	79%	83%	77%	64%	59%
Ethnicity										
White	89%	89%	84%	85%	78%	85%	77%	84%	89%	87%
Asian	7%	7%	11%	11%	14%	9%	13%	10%	7%	7%
Black heritage	4%	4%	4%	4%	7%	5%	8%	5%	4%	4%
Sexuality										
LGB	12%	13%	17%	14%	14%	12%	10%	13%	11%	11%
Heterosexual	85%	83%	78%		81%	83%		83%	85%	84%
Other	1%							1%	0%	2%

**The ratio was calculated as a ratio between the number of males and female, and blank cells indicate base size <30.*

We next examined associations between gaming activities and socio-demographics such as gross household income, marital status, age group, and different levels of gambling problems. A powerful multivariate technique known as Multiple Correspondence Analysis (MCA), was applied to large tables presenting a set of characteristics (e.g., gender, income, gaming type,

etc.). MCA extracts what is considered the most significant information: similar characteristics are depicted on the graph as points that tend to cluster together. The final analysis figure included only characteristics that were reliably grouped together. Critically, the further these grouped points were from the zero point (the intersection between horizontal and vertical axes), the stronger the associations were between them (Figure 13).

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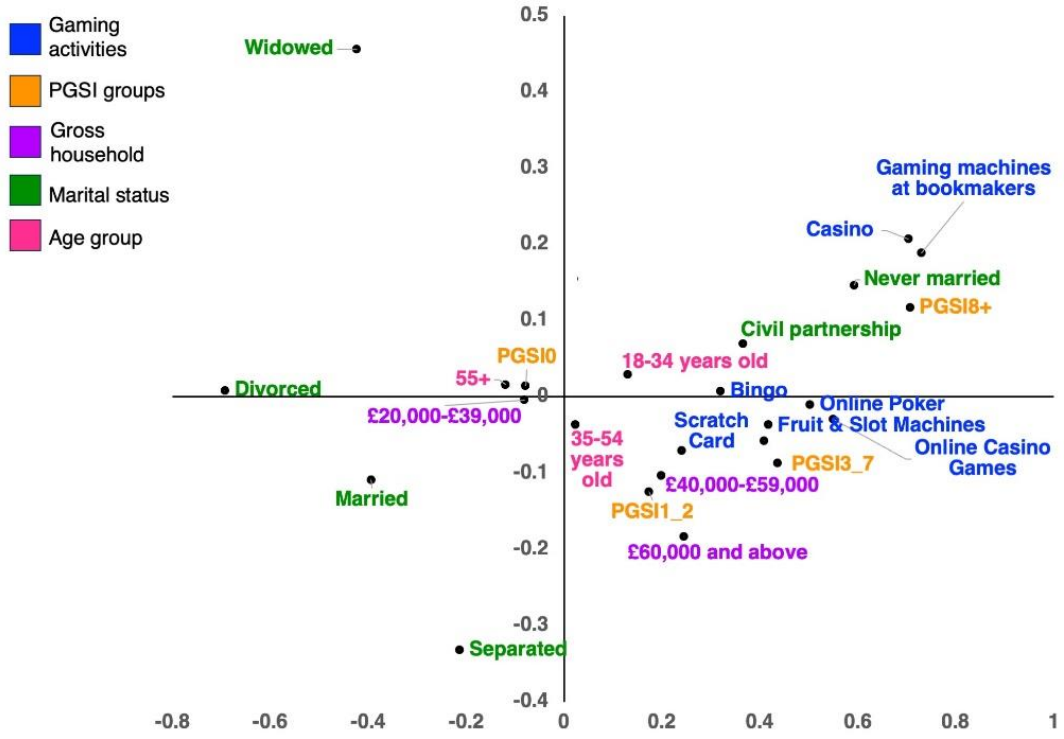
As shown in Figure 13, the upper-right quadrant indicates a strong association between participating in gaming machines at bookmakers and engaging in in-person casino gambling. Both activities show a strong association with the likelihood of experiencing 'problem gambling'. Additionally, this quadrant is linked to individuals who have never been married or in a civil partnership and those within the age range of 18 to 34. Proceeding clockwise, strong associations are found among involvement in online poker, fruit or slot machines, online casino games, and, to a lesser extent, taking part in scratch cards. These gaming activities are linked to experiencing a moderate level of gambling problems. Additionally, engaging in online poker, fruit or slot machines, online casino games and scratch cards show a relatively strong association with a gross household income of £40,000-£59,000 and a weak association with a gross household income of £60,000 and above. The association between age and all other points in this quadrant is not notably strong.

Figure 13. Multiple associations between gaming activities and socio-economic characteristics of people who engaged in gaming



4.2.4. Behavioural differences (motivations, changes in participation in Last 12 months) among the broad and individual categories

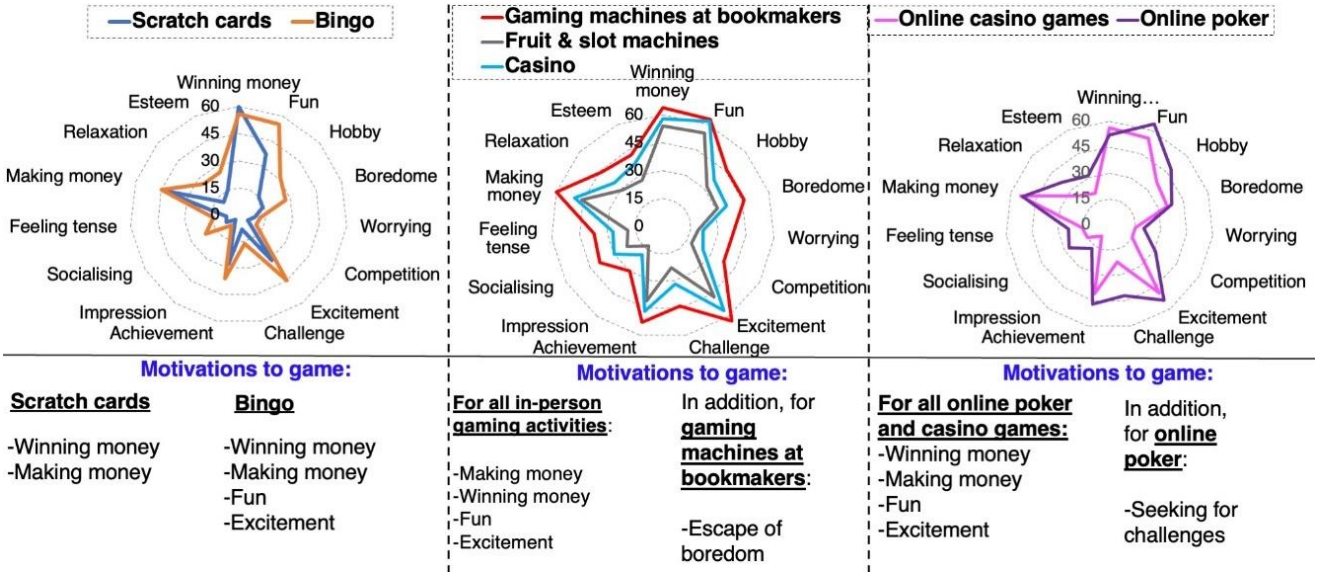
Motivation plays a crucial role in continued engagement in gaming activities. Motivational factors for individual gaming categories are displayed in Figure 14.

We employed a spider chart to assess the motivations behind participation in gaming activities. This chart features 16 axes, each one representing a separate motivational factor.

For each motivation factor, we calculated the proportion of people who selected this factor (responding 'always' or ‘often’) for each gaming activity.

The values attributed to all motivational factors are interconnected, thus revealing a distinct pattern of the most likely reasons for engaging in gaming activities. For instance, individuals partaking in scratch cards and bingo are mostly driven by the excitement, the prospect of winning, and the desire to make money. Notably, unlike scratch card participants, bingo participants are also significantly inspired by the enjoyment factor (having fun).

Figure 14. Motivational factors of engaging in gaming activities.



Most scratch card and bingo participants gambled weekly, with no significant difference in spending frequency between the two games. Approximately 25% of these participants reported reduced spending and time on these activities over the last year. However, the increase in spending and time on scratch cards and bingo was nearly double compared to lotteries, indicating a rising interest in these games.

About 23% of participants engaged in in-person gaming weekly, with 20% participating 2-3 times per week. Equal numbers reported lower (26%) and higher (25%) in-person gaming spending, with half seeing no change from the previous year. In-person gaming time slightly declined for 27% of participants, while 21% increased their gaming time (Figure 15). The frequency of online gaming, including poker and casino games, mirrored that of in-person gaming over the past year.

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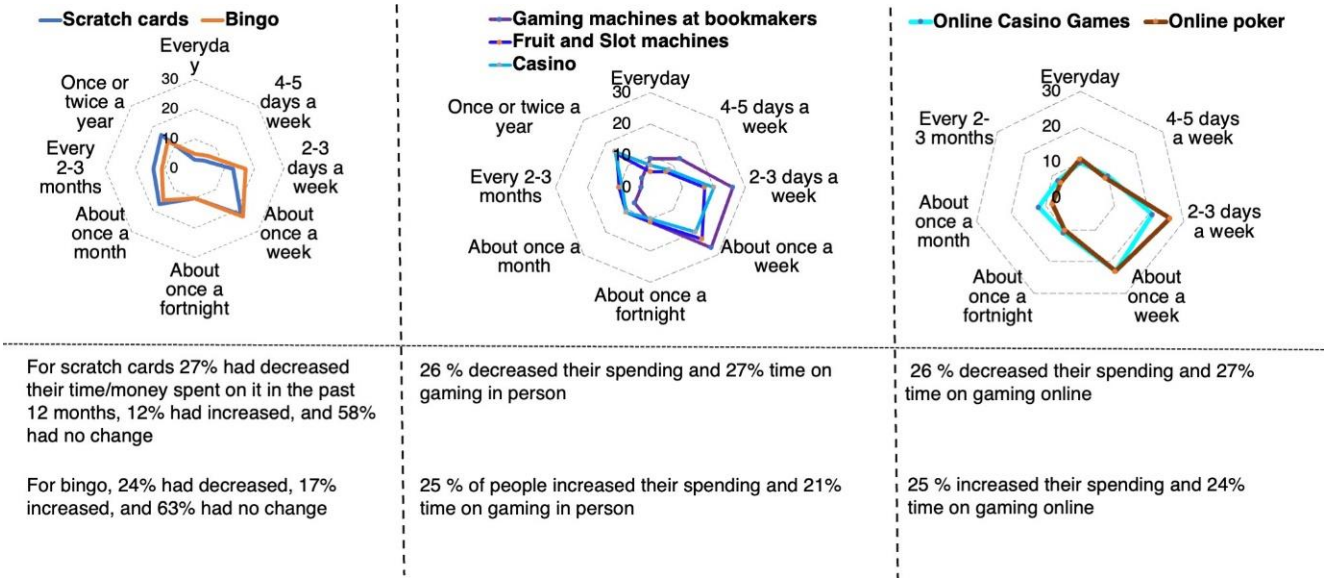
Figure 15. Proportion of changes in participating in gaming activities in the last 12 months



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4.2.5. Modes of gaming activities and problems (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

Table 11 shows that online gaming (20%) and in-person gaming (26%) involved a larger proportion of individuals experiencing 'problem gambling (PGSI 8+) compared to scratch cards and bingo (involving both modes of gaming, 7%). This also applied to those experiencing any problems (PGSI 1+). 18

Table 11. Proportion of people per PGSI grouping who engaged in different modes of gaming activities

	Mode of gaming			
	Scratch cards and Bingo	Any in-person gaming	Any online gaming	Any gaming (average)
PGSI 0	69%	42%	38%	49%
PGSI 1-2	16%	18%	23%	19%
PGSI 3-7	8%	14%	19%	14%
PGSI 8+	7%	26%	20%	18%
NET:1+	31%	58%	62%	51%

**Min base = 289.*

We tested whether factors like gender, education, income, age, gambling habits, marital and employment status, sexuality, religion and ethnicity could predict engagement in gaming activity. Multinomial logistic regression was used to analyse how these variables affected gaming frequency, considering that all these variables connected with each other. Results for online, in-person, and mixed gaming modes are outlined in Table 12, with detailed information provided in Appendix 2.

Table 12. Summary of regression analyses testing socio-economic and demographic predictors of engaging in different modes of gaming. The outcome variables are modes of gaming. The predictors are displayed in the left column*

	Modes of gaming		
Socio-economic demographic characteristics	**Online**	**In person**	**Both**
Marital status	Not significant predictor	Being in civil partnership compared to never been married	Being married compared to never been married
Age group	Likelihood (18-34):(35-55):(55+) 1 : 0.78 : 0.42	Likelihood (18-34):(35-55):(55+) 1 : 0.71 : 0.45	Likelihood (18-34): (35-55):(55+) 1 : 0.86 : 0.57
PGSI score groupings	The likelihood of engaging increases with experiencing gambling problems	The likelihood of engaging increases with experiencing gambling problems	The likelihood of engaging is consistent across PGSI grouping
Gender	Likelihood [men : women] 1.27 : 1	Likelihood [men : women] 1.41 : 1	Likelihood [men : women] 0.58 : 1
Employment	The likelihood of engaging is higher in not working people	The likelihood of engaging is higher in working people	Not significant predictor
Gross household	Not significant predictor	Not significant predictor	Higher engagement of people with income up to £20,000 per year
Education	Not significant predictor	Not significant predictor	Higher engagement of people with no education

**Sexuality and religion did not predict any of the gaming modes and were not included in the table.*

Table 12 lists socio-economic and demographic factors as potential predictors for engaging in each mode of gaming (online, in-person, or both). The term 'likelihood' here pertains to the chance that individuals will engage in a specific gaming mode. For instance, the probability of people aged 35-55 years engaging in online gaming is 0.78, and the probability of those aged 55 and over engaging in online gaming is 0.42, in comparison to young adults aged 18-34 years, whose likelihood is 1. Compared to men, women were more likely to participate in gaming activities involving both in-person and online modes. Unemployed individuals were more likely to engage in online gaming, whereas working individuals were more likely to engage in in-person gaming.

4.3. Deep dive among betting products

Betting products include betting on horse or dog races – online, betting on horse or dog races – in person, betting on football – online, betting on football - in person, betting on other sports – online, and betting on other sports – in person, as shown in Table 2.

4.3.1. Summary of key results

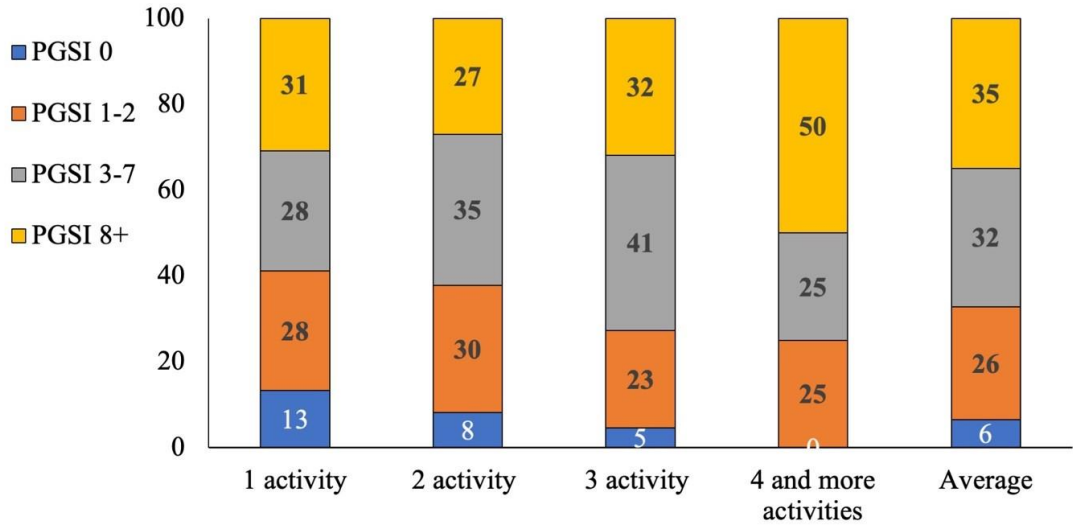
- **Overall prevalence of problems within betting:** Among those participating in any betting in the last 12 months, 43% were experiencing any problems with their gambling (PGSI 1+) and 10% were experiencing 'problem gambling' (PGSI 8+).
- **Engagement in betting activities and level of problems:** Participation in more betting activities was associated with experiencing an increased level of problems.
- **Differences in betting activities by demographics**:

    - Individuals aged 55+ were more likely to participate in betting on horse/dog races than football or other sports, with no clear preference among middle-aged groups.
    - Non-religious individuals tended to bet online (59%) more than in person (41%), whereas those with religious beliefs were more inclined to bet in person (55%) compared to online (38%).
    - Retirees often bet on horse or dog racing, while unemployed individuals and students were less common among bettors.
- **Differences in betting activities by mode**: Online betting, especially football and horse/dog racing, was more popular than in-person, with a 31% to 10% split. Compared to online betting, in-person betting was associated with a higher proportion of those experiencing any problems (PGSI 1+) or problem gambling (PGSI 8+). Men were twice as likely to bet in person and three times as likely to bet online compared to women.
- **Motivations for betting activities:** Compared to gaming motivation, betting involves additional emotional and social factors such as feeling tense, seeking for challenge and competition.
- **Frequency within betting activities:** People who engaged in online or in-person betting typically spent money on gambling once a week (24%) or 2-3 times per week (22%).

4.3.2. Engagement in number of betting activities and problems (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

Individuals experiencing 'problem gambling' (PGSI 8+) showed greater involvement in multiple betting activities (Figure 16). For instance, 36% of the PGSI 8+ group participated in more than one betting activity, compared to only 4% of the PGSI 0 group. This indicates that participating in multiple betting activities may be linked to a higher risk of developing 'problem gambling'.

Figure 16. The proportion of people who engaged in betting activities and PGSI score groupings in the last 12 months



4.3.3. Demographics in broad and individual categories (age, gender, ethnicity, religion, etc.)

Individuals aged 55 and older were more likely to bet on horse or dog racing than sports, with participation rates at 34% and 17% respectively. Young adults favoured sports betting by 12% over horse/dog racing. Middle-aged individuals showed no specific preference in betting activities. The majority of individuals involved in betting activities (89%) identified themselves as heterosexual, with a small proportion being LGB (7%). Most participants of betting activities were employed either full or part-time (76%). Unemployed individuals and full-time students comprised smaller proportions (7% and 5% respectively). Betting on horse or dog races, both online and in person, attracted almost three times as many retired individuals compared to other betting activities.

Betting participation across all social grades was consistent, indicating no particular preference for a specific type of betting. Details about social-demographic characteristics of people engaging in betting activities can be found in Table 13.

Table 1312.Socio-economic and demographic characteristics of people taking part in betting activities in the last 12 months

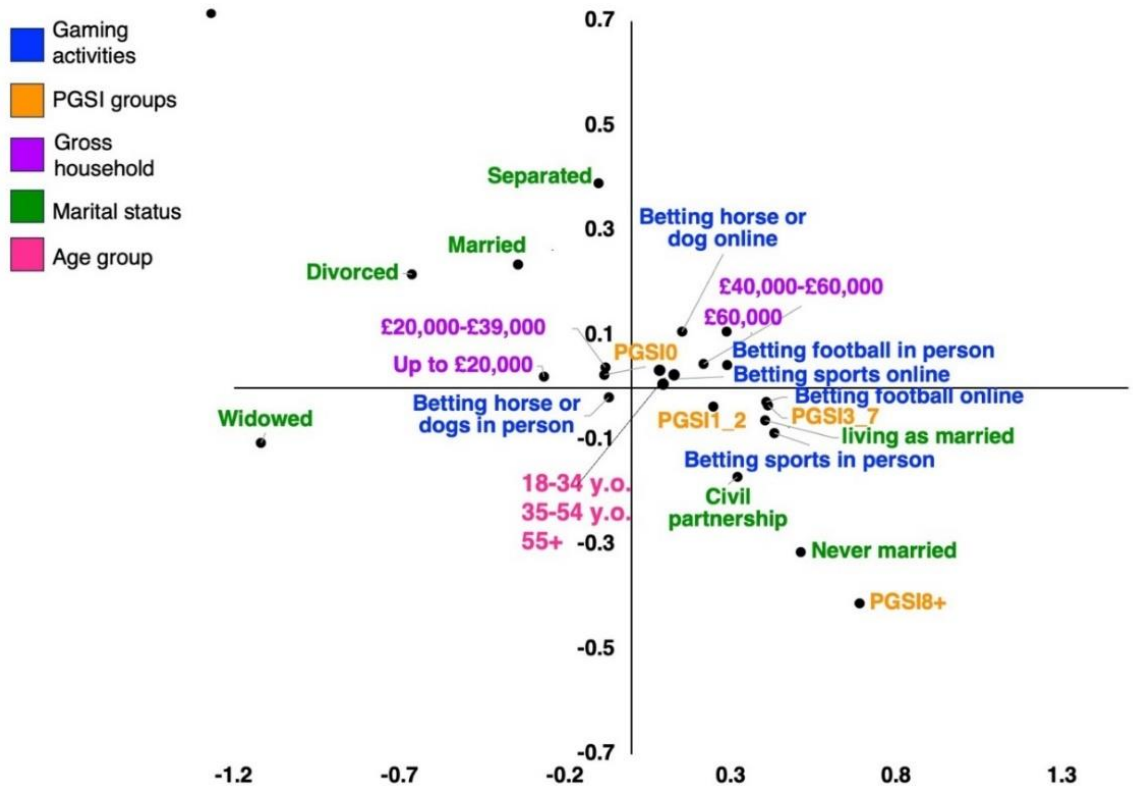
	Horse or dog races online	Horse or dog races in person	Football online	Football in person	Other sports online	Other sports in person	NET: any betting	% among gambling	% among population
Age									
18-34	27%	26%	38%	33%	41%	41%	34%	27%	29%
35-54	45%	35%	45%	45%	43%	43%	43%	37%	35%
55+	28%	39%	17%	22%	15%	16%	23%	36%	35%
Religion									
No religion	56%	44%	62%	44%	60%	35%	50%	54%	42%
Any religions	42%	54%	36%	53%	37%	58%	47%	43%	53%
Gender									
Males	65%	63%	78%	83%	81%	75%	74%	49%	47%
Females	35%	37%	22%	17%	19%	25%	26%	51%	53%
Gender ratio*	1.9	1.7	3.5	4.9	4.3	3	3.2	0.9	0.9
Social grade									
A +B	15%	15%	15%	15%	16%	20%	16%	18%	16%
C1	20%	16%	21%	18%	23%	20%	20%	22%	20%
C2	13%	11%	15%	17%	14%	16%	14%	15%	13%
D+E	16%	14%	16%	20%	14%	16%	16%	18%	17%
Education									
A-level	24%	24%	24%	24%	24%	23%	24%	20%	20%
Degree	34%	33%	38%	30%	41%	37%	36%	37%	38%
GCSE	16%	17%	14%	18%	13%	14%	15%	15%	14%
Other	26%	26%	24%	28%	23%	26%	26%	29%	28%
Gross-household per year									
Up to £20,000	20%	22%	19%	20%	16%	19%	19%	19%	19%
£20,000-£39,000	27%	29%	29%	31%	26%	28%	28%	27%	26%
£40,000-£59,000	17%	17%	16%	17%	18%	18%	17%	15%	15%
£60,000 and above	13%	11%	16%	14%	20%	16%	15%	14%	14%
Marital status									
Civil partnership	1%	1%	1%	3%	2%	3%	2%	1%	1%
Divorced	5%	5%	4%	4%	4%	4%	4%	6%	6%
Living as married or married	59%	58%	54%	51%	51%	52%	55%	57%	56%
Never married	31%	31%	37%	40%	40%	39%	36%	30%	31%
Separated	2%	1%	2%	1%	2%	1%	2%	2%	2%
Widowed	2%	4%	1%	2%	2%	2%	2%	4%	4%
Employment									
Retired	17%	24%	8%	8%	8%	8%	12%	25%	24%
Student	3%	5%	6%	5%	6%	5%	5%	5%	6%
Unemployed	6%	5%	7%	8%	7%	7%	7%	6%	11%
Working	74%	67%	79%	79%	79%	80%	76%	64%	59%
Ethnicity									
White	92%	90%	88%	81%	86%	72%	85%	89%	87%
Asian	4%	6%	7%	11%	8%	20%	9%	7%	7%
Black heritage	3%	4%	5%	7%	5%		5%	4%	4%
Sexuality									
LGB				8%	7%		7%	11%	11%
Heterosexual		91%	90%	88%	89%	85%	89%	85%	84%
Other							0%	0%	2%

**The ratio was calculated as a ratio between the number of males and female, and blank cells indicate base size <30.*

We used MCA to examine the connections between betting, socio-demographic factors, and varying levels of gambling issues (Section 4.2.3 for details of this analysis). Strong associations were found between online football betting, moderate-level gambling problems, marital status, and in-person betting on other sports (Figure 17, bottom-right quadrant). In-

person football betting was associated with a household income of £40,000-£60,000 (Figure 17, top-right quadrant).

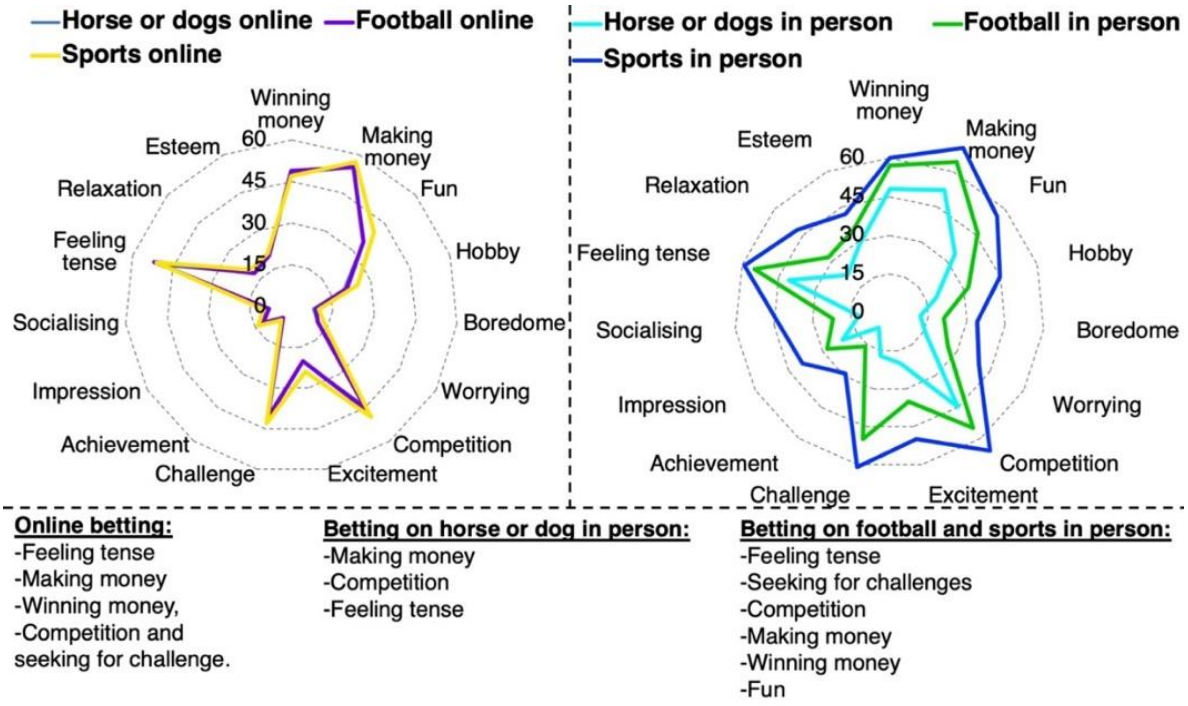
Figure 1719. Multiple associations between betting activities and socio-economic characteristics of people who engaged in betting



4.3.4. Behavioural differences (motivations, changes in participation in Last 12 months) among the broad and individual categories

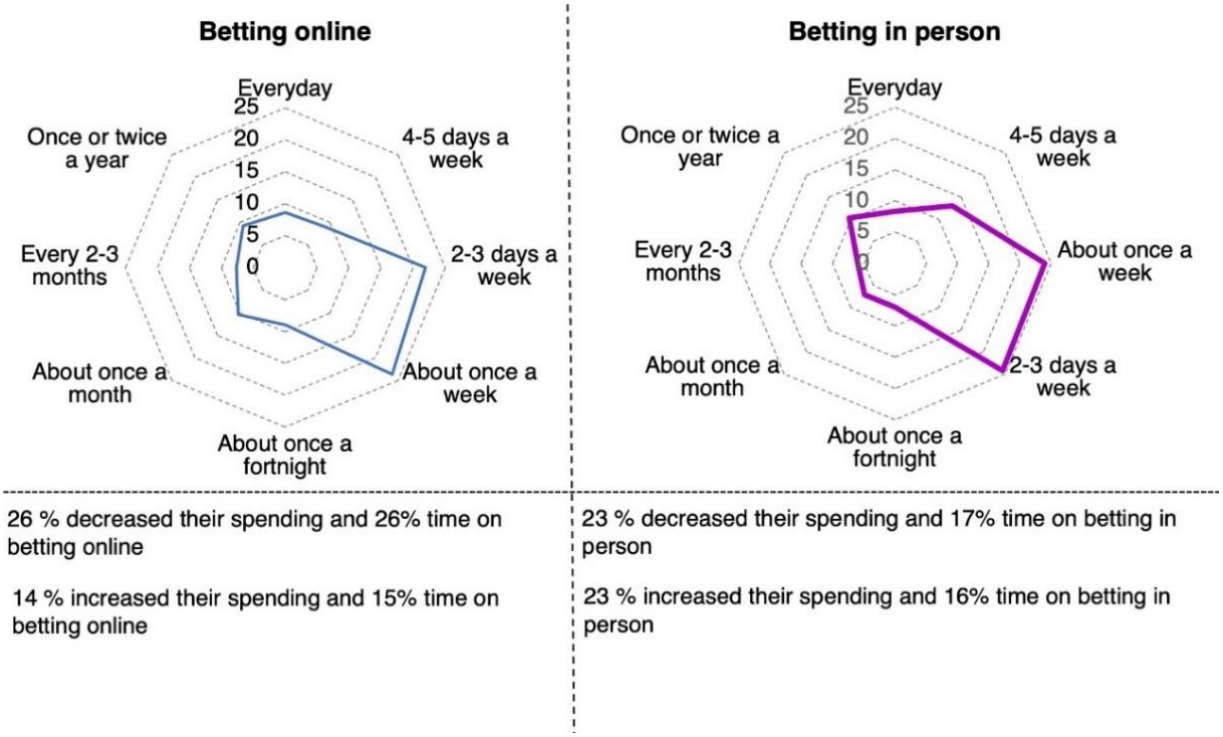
Betting on horses or dogs and online sports betting, notably football, was motivated by common factors such as seeking monetary gains, excitement from winning, experiencing tension, competing, and seeking challenges (Figure 18). To interpret the spider chart, see Section 4.2.4. In-person betting on other sports showed a wider array of motivational factors compared to in-person football or horse/dog racing betting (Figure 18). Compared to gaming, motivation for betting involves additional emotional and social factors such as feeling tense, seeking challenge and competition.

Figure 1820. Motivational factors of engaging in categories of betting activities.



People who engaged in online or in-person betting typically spent money on gambling weekly, with 24% gambling once a week and 22% gambling 2-3 times per week. Over the past 12 months, there was a 22% decrease in participation in betting activities, while approximately 14% of those who engaged in betting reported increased spending and time dedicated to gambling activities (see Figure 19).

Figure 1921. Betting participation and change in last 12 months



2223

4.3.5. Modes of betting activities and problems (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

Table 14 shows the percentage of individuals involved in online and in-person betting. Compared to online betting, 'problem gambling' (PGSI 8+) is more associated with in-person betting as the proportion was twice as high as that in online betting. Moreover, in-person betting was associated with higher proportion of those experiencing any problems (PGSI 1+).

Table 14. Proportion of people per PGSI grouping who engaged in different modes of betting activities

	Mode of betting		
	Any in-person betting	Any online betting	Any betting (average)
PGSI 0	42%	69%	56%
PGSI 1-2	18%	16%	17%
PGSI 3-7	14%	8%	11%
PGSI 8+	16%	7%	12%
NET:1+	48%	31%	40%

**Min base = 160.*

We then investigated whether socio-economic and demographic factors, such as gender, education, household income, age group, gambling issues, marital status, employment, sexuality, and religion, could forecast involvement in betting activities online and in-person using multinomial logistic regression. These analyses are summarised in Table 15 (for a comprehensive analysis and interpretation, see Appendix 3).

Table 1513. Summary of regression analyses testing socio-economic and demographic predictors of engaging in different modes of betting activities in the last 12 months. Outcome variables are modes of betting. The predictors are displayed in the left column.

Modes of betting		
Socio-economic and demographic characteristics	**Online**	**In person**
Marital status	Proportion of people being married or in civil relationship is lower compared to never been married cohort Likelihood 0.65 : 0.88 : 1	Not significant predictor
Age group	Likelihood (18-34):(35-55):(55+) 1 : 0.78 : 0.42	Likelihood (18-34):(35-55):(55+) 1 : 1 : 1:54
PGSI score groupings	The likelihood of engaging increases with experiencing gambling problems	The likelihood of engaging increases with experiencing gambling problems
Gender	Likelihood [men : women] 2.79 : 1	Likelihood [men : women] 1.93 : 1
Employment	The odds of working people are 1.45 compared to retired	The odds of working people are 1.48 compared to retired
Gross household	The odds of engaging increase with increasing gross household	Not significant predictor
Education	Not significant predictor	Larger proportion of people with no education then individuals holding a degree Likelihood 1 : 0.74
Religion	Larger proportion of people with no religious beliefs	Larger proportion of people with any religious beliefs

4.4. Deep dive among lotteries

Lottery products include tickets for the national lottery draw (including Thunderball and EuroMillions and tickets bought online), and tickets for any other lottery (including charity lotteries), as shown in Table 2.

4.4.1. Summary of key results

- **Overall prevalence of problems within lotteries:** Among those participating in lotteries in the last 12 months, 19% were experiencing any problems with their gambling (PGSI 1+) and 3% were experiencing 'problem gambling' (PGSI 8+).
- **Differences in lotteries by demographics:**
    - Both national and other lotteries were more popular among middle-aged and older individuals compared to younger adults.
    - Participation in the national lottery showed no significant gender differences, but women participated in other lotteries 27% more than men. Participation in both national and other lotteries tended to increase with higher gross household income.
    - Retired individuals were more likely to participate in the national lottery than students and the unemployed and 1.2 time less than employed individuals. Retired individuals were also more likely to participate in other lotteries compared to students, the unemployed, and working individuals. Among national lottery participants, the odds of not adhering to any religious belief were slightly higher than for those with any religious beliefs. Engaging in other lotteries showed no religious preferences.

- **Motivations for lottery participation:** The primary motivation for participating in both national and other lotteries was the chance to win money, cited by 62% and 44% of respondents respectively.
- **Frequency of lottery participation:** About one-third participated in lotteries weekly, while another third participated monthly. Approximately 20% of respondents decreased their lottery spending and participation in the last year, while 8-10% increased their involvement.

4.4.2. Engagement in individual lottery category and problems (PGSI 0, 1-2, 3-7, 8+, and NET: 1+)

On average, engagement in each category of lottery was consistent across the PGSI groups (Table 16). For either national lottery or other lotteries, the proportion of those with no reported problems was much higher compared to those participating in gaming and betting activities. 24

Table 16. Proportion of people per PGSI grouping who engaged in lottery activities in the last 12 months.

	Lottery activities		
	National lottery only	Other lotteries including charity only	Any lotteries (average)
PGSI 0	81%	80%	80%
PGSI 1-2	12%	10%	11%
PGSI 3-7	5%	5%	5%
PGSI 8+	3%	5%	4%
NET:1+	20%	20%	20%

**Min base = 367.*

4.4.3. Demographics in broad and individual category (age, gender, ethnicity, religion, etc.)

Socio-economic and demographic characteristics of individuals engaging in lotteries are summarised in Table 17. 14

The left-hand column of the table presents socio-economic and demographic characteristics. Two other columns indicate the percentage of individuals participating in the national lottery and other lotteries, including those for charity. For instance, 20% of young adults (aged 18-34), 41% of middle-aged individuals (35-54) and 39% of those aged 55 and over partake in the national lottery. Other lotteries see participation from 50% of individuals who are 55 or older, 34% of the middle-aged group, and 16% of young adults.

Table 15.Socio-economic and demographic characteristics of people taking part in lottery activities in the last 12 months

	National lottery	Other lotteries	NET: any lottery	% among gambling	% among population
Age					
18-34	20%	16%	18%	27%	29%
35-54	41%	34%	38%	37%	35%
55+	39%	50%	45%	36%	35%
Religion					
No religion	54%	49%	52%	54%	42%
Any religion	43%	49%	46%	43%	53%
Gender					
Males	47%	13%	30%	49%	47%
Females	43%	16%	46%	51%	53%
Gender ratio*	1.1	0.8	0.95	0.9	0.9
Social grade					
A + B	16%	16%	16%	18%	16%
C1	20%	20%	20%	22%	20%
C2	14%	15%	15%	15%	13%
D + E	16%	16%	16%	18%	17%
Education					
A-level	20%	19%	20%	20%	20%
Degree	35%	32%	34%	37%	38%
GCSE	16%	17%	17%	15%	14%
Other	29%	32%	31%	29%	28%
Gross-household per year					
Up to £20,000	17%	19%	18%	19%	19%
£20,000-£39,000	27%	29%	28%	27%	26%
£40,000-£59,000	17%	16%	17%	15%	15%
£60,000 and above	16%	14%	15%	14%	14%
Marital status					
Civil partnership	1%	1%	1%	1%	1%
Divorced	7%	8%	8%	6%	6%
Living as married or married	61%	62%	62%	57%	56%
Never married	25%	21%	23%	30%	31%
Separated	2%	2%	2%	2%	2%
Widowed	4%	6%	5%	4%	4%
Employment					
Retired	26%	36%	31%	25%	24%
Student	2%	2%	2%	5%	6%
Unemployed	5%	4%	5%	6%	11%
Working	67%	58%	63%	64%	59%
Ethnicity					
White	90%	92%	91%	89%	87%
Asian	6%	5%	6%	7%	7%
Black heritage	4%	3%	3%	4%	4%
Sexuality					
LGB	10%	9%	10%	11%	11%
Heterosexual	87%	88%	87%	85%	84%
Other	0%		0%	0%	2%

**The ratio was calculated as a ratio between the number of males and female, and blank cells indicate base size <30.*

We next performed two multiple regression analyses to test which socio-economic and demographic factors could predict engagement in national lottery and other lotteries. The results of these analyses are summarised in Table 18 (see details in Appendix 5).

Table 1816. Summary of regression analyses testing socio-economic and demographic predictors of engaging in lottery activities in the last 12 months. Outcome variables are lotteries. The predictors are displayed in the left column.

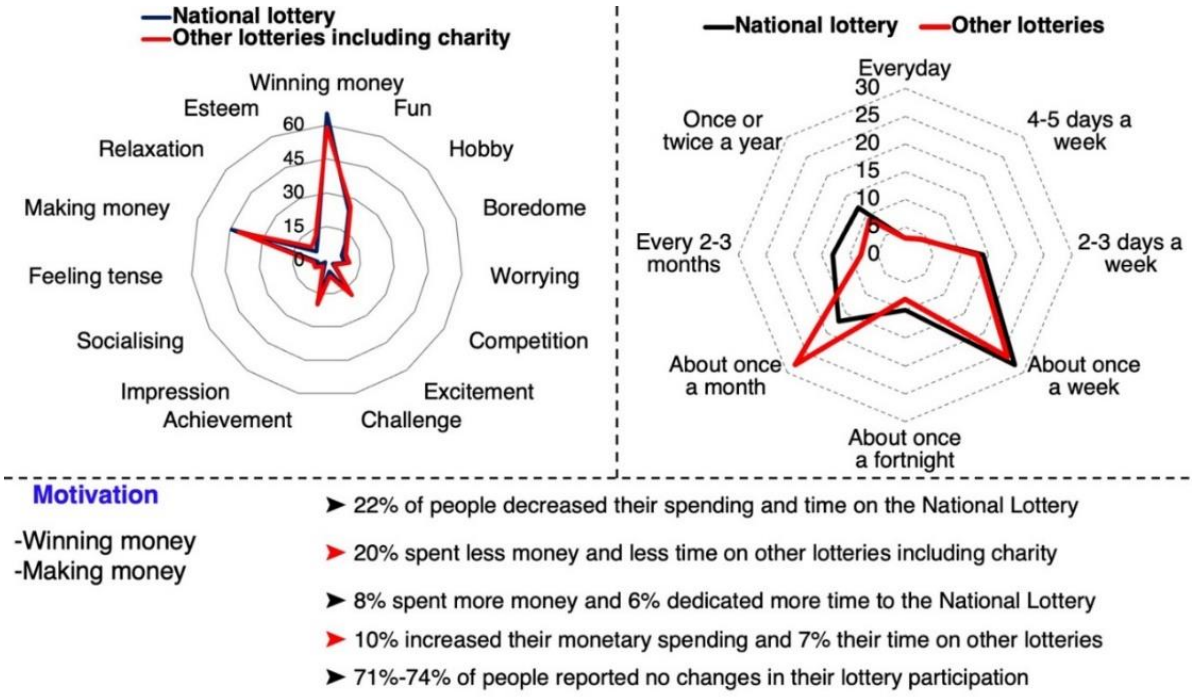
Lotteries		
Socio-economic and demographic characteristics	**National lottery**	**Other lotteries including charity**
Marital status	Not significant predictor	Higher likelihood of being married or widowed
Age group	Likelihood (18-34):(35-55):(55+) 1 : 1.55 : 2.35	Likelihood (18-34):(35-55):(55+) 1 : 2.25 : 2.62
PGSI score groupings	The likelihood of engaging decreases with experiencing gambling problems	The likelihood of engaging increases slightly with experiencing gambling problems
Gender	Likelihood [men : women] 0.92 : 1	Likelihood [men : women] 1 : 1.27
Employment	The odds of student, unemployed and working people are 0.48, 0.59 and 0.84 compared to retired	The odds of student, unemployed and working people are 0.45, 0.8 and 1.32 compared to retired
Gross household	The odds of engaging increase with increasing gross household	The odds of engaging increase with increasing gross household
Education	Not significant predictor	Not significant predictor
Religion	The odds of holding no religious believes is 1.09 times likely than having any religious believes	Not significant predictor

We also examined the associations between lottery activities and socio-economic and demographic factors and levels of gambling problems using MCA (see Section 4.2.3 for detailed information on this analysis). In contrast to gaming or betting activities, lotteries were not strongly associated with any socio-economic or demographic factors (see details in Appendix 4).

4.4.4. Behavioural differences (motivations, changes in participation in Last 12 months) among the broad and individual categories

Lottery participation was primarily driven by the chance to win money. This was mentioned by 62% of respondents (national lottery) and 44% of respondents (other lotteries) (Figure 20). One-third of participants engaged in both national and other lotteries weekly, while another third participated monthly in other lotteries (Figure 20). Approximately one-fifth of respondents reduced both their spending and time devoted to lottery participation over the past year. Between 8% to 10% of surveyed individuals reported an increase in their involvement with lotteries.

Figure 2025. Motivational factors of engaging in lotteries and changes in lottery participation in last 12 months



5. Discussion

In this section we summarise, synthesise and discuss our findings, and then present our recommendations based on these findings, which we consider within the context of the recent DCMS White Paper, *High Stakes: Gambling Reform for the Digital Age*.

5.1. Key findings from the rapid integrative literature review

It is clear from the rapid integrative literature review that different types of gambling differ significantly in terms of harm. Based on the research evidence reported in the literature review and secondary analyses, we can suggest a hierarchy of harm from most to least harmful gambling types. This hierarchy is supported by various studies and data sources indicating the relative risks associated with different forms of gambling:

- Electronic Gaming Machines (EGMs): EGMs were consistently associated with the greatest risk of harm and highest levels of problem gambling, across countries. Academic studies show they are implicated in over 50% of gambling problems, with a greater frequency of EGM gambling linked to increased risk of gambling-related harms. Participating in EGMs was also associated with future gambling harm. These findings are likely because EGMs contain a range of features that present a sense of 'flow' (such as jackpots, a mix of large and small payouts and audiovisual feedback) and thus facilitate excessive time and spending on a device (Browne et al., 2023). These findings would suggest that EGMs require strict regulation. It may also be necessary to consider significantly reducing their availability or implementing more robust harm reduction measures to mitigate the risks they pose.
- Casino Games: Casino games are associated with the second highest level of harm, with a high proportion of individuals experiencing problem gambling. These games

have a significant association with gambling problems, especially when compared to lotteries or sports betting.

- Sports Betting: Sports betting, particularly in-play betting and custom sports bets, is associated with higher problem gambling severity scores and greater gambling-related harms compared to lotteries and bingo. As such, we call for strategies to reduce harm from this type of betting. Such strategies could include limiting the speed of play between in-play bets, limiting the number of bets that can be placed during a particular sporting event, or requiring in-play bets to be placed by telephone rather than mobile app. Such strategies would increase friction and slow down the speed of play. This reflects recommendations that have been made within the gambling research literature (Vieira et al., 2023).
- Scratch Cards: Although associated with less risk of harm than EGMs, casino games, and sports betting, scratch cards still pose a risk. Greater frequency of scratch card gambling is associated with an increased likelihood of gambling-related harm.
- Lottery: Lotteries are generally considered low risk compared to other gambling types. Approximately 1/3 of individuals who gambled on lotteries only were at some risk of harm (Booth et al., 2020). However, they are not entirely without harm, as a small percentage of lottery participants still meet the criteria for problem gambling. The harms caused by lotteries may be overshadowed by the more severe harms that are associated with other gambling activities such as casino games.
- Bingo: Bingo is identified as the activity with the lowest levels of associated gambling problems. However, based on evidence that gambling online was often associated with greater risk than gambling offline, the shift to online bingo might alter its risk profile, necessitating further research.

The academic literature demonstrates that online gambling is usually associated with greater harm than offline gambling, and gaming (e.g., taking part in casino games) is usually associated with greater harm than betting. However, in addition to the medium through which the gambling is occurring (online vs offline), it is also important to consider the device with which betting takes place, as smartphones or tablets may involve higher potential risk of harm compared to laptops/desktop computers due to greater accessibility and portability. Online gambling also has unique risks not typically found in offline gambling, including gambling-related activities in video games (e.g., loot boxes, skin betting) that have been found to be associated with greater risk of gambling-related harm (Zendle, 2020). This is particularly concerning as individuals aged under 18 years commonly engage in such activities as they are not legally classified as gambling and/or not regulated in GB, and the DCMS White Paper did not mention any plans to change this.

When assessing the above findings, it is important to consider the strengths and limitations of the methodologies used in the studies identified in the literature review. Most studies were based on cross-sectional surveys that were designed to be representative of the target population. However, it is important to note that there are several sources of bias inherent in self-reported survey methodology such as recall and social desirability biases, especially in relation to topics which respondents may consider to be sensitive (Krumpal, 2013). Only one study was based on operator data (data that operators hold about customers and their account history) (Lindner et al., 2020). Operator data provides objective insight into the relative harm of different types of products in terms of amounts gambled, time gambled, and amounts lost. Operator data could also provide insight into gambling engaged in by under-researched populations such as women, ethnic minority groups, and other groups who might be reluctant

to take part in surveys about gambling due to stigma (e.g., Baxter et al., 2016; Hing et al., 2016). If a shared customer database between operators is not in place, it is difficult to identify and intervene with at-risk individuals who have accounts with multiple operators.

5.2. Key findings from secondary data analysis

Following our rapid integrative literature review, we performed secondary analyses on gambling types based on the T&S Survey data, including three waves of data collection in November 2020, 2021, and 2022[10]. Based on the prevalence of people experiencing any problems (PGSI 1+), the three most harmful types of gambling (in terms of likelihood of individuals scoring 8+ on the PGSI) identified in this analysis were:

1. Gaming machines in bookmakers
2. In-person betting on other sports
3. Online casino games

When based on 'problem gambling' (PGSI 8+), the top 2 types remain the same whereas the third type becomes gambling in a casino (any type).

Comparing findings from the secondary data analysis and rapid integrative literature review, EGMs, casino games and sports betting are consistently found to be the most harmful types of gambling. Also consistent with the rapid integrative literature review, we found that the least harmful gambling types are national lottery, other lottery and scratch cards, as they included a larger proportion of people gambling without problems compared to other types. However, the national lottery was found to have the highest number of people experiencing any level of gambling problems, due to the large volume of people who bet on the lottery. As for the three broad gambling categories, overall gaming activities was associated with higher risk than betting activities, and lottery activities had the lowest proportion of those experiencing problems. Regarding modes of gambling, in-person betting involved a larger proportion of 'problem gambling' as well as a larger proportion of any problems, compared to online betting. For gaming activities, those engaging in in-person gaming only or online gaming only exhibited a larger proportion of individuals experiencing 'problem gambling' and any problems compared to those engaging in activities involving both modes (scratch cards and bingo).

Analysis of the secondary data found that the more gambling activities an individual engages with, the more likely they are to experience higher levels of gambling problems. However, the relationships between frequency of gambling and gambling problems are more complex. Overall, the less frequently people gamble, the less likely they are to experience gambling problems. However, among those gambling once a week, there was a larger proportion of individuals gambling without any problems compared to those gambling once a fortnight. Considering our behavioural analysis, this may be because individuals taking part in scratch cards and bingo tend to do so once a week, and those taking part in lotteries tend to do so either once a week or once a month (rather than once a fortnight). These activities involve relatively low risk of gambling problems according to our prevalence analysis.

Significant differences in demographical factors among gambling types were observed. For example, women preferred scratch cards and bingo, whereas online poker appealed more to men. Young adults (18–34) predominantly used gaming machines at bookmakers or gambling in casinos compared to other older age groups. There were more young adults

[10] Wave 1 data was missing for loot boxes and online poker, so we analysed Wave 2 and Wave 3 for those two types.

taking part in sports betting, compared to those aged 55+ who favoured betting on horse or dog racing. Motivation was found to vary among individual gaming activities. Scratch card participants were primarily motivated by winning money. Bingo participants primarily sought fun and excitement, often in a social context. In-person gaming, including bookmakers' machines, was driven by desires for money, winning, fun, excitement, and escaping boredom. Online gaming activities combined these motivations with achievement and challenges, especially in online poker. The primary motivations for betting, whether online or in-person and regardless of which sports, were monetary gain, excitement of winning, experiencing tension, engaging in competition, and seeking challenges. In-person sports betting showed a broader range of motivational factors. The primary motivation for participating in national and other lotteries was the chance to win money.

5.3. Limitations

The present secondary analysis has several limitations. Firstly, due to the observational nature of the data, causal relationships between gambling harms and other factors cannot be determined. Secondly, the Problem Gambling Severity Index (PGSI) may not adequately assess relative product risk or gambling harms, given the diverse range of gambling products individuals engage with, making it difficult to control for variability. This prompts consideration for the development of a product-related risk framework, potentially including factors like spin speed, stake limits, mandatory breaks, and messaging.

Additionally, further discussion on the categorisation of different gambling types is warranted, especially regarding scratch cards – although they are essentially instant wins, this type might have included respondents only taking part in national lottery scratch cards which might have lowered the prevalence of problems found for scratch cards other than national lotteries. Similarly, gaming machines in bookmakers might have included fruit or slot machines though these were examined as two separate gambling types in the T&S Survey, adding complexity to the analysis, but also indicating the benefit of our analysis in isolating participants who engaged in only one type of gambling activity to examine the prevalence of problems more accurately. Another limitation arising from the survey is that while we linked engagement in different gambling types to motivational factors and changes in gambling involvement, we were unable to isolate those exclusively using a certain gambling product from others when exploring these motivational and behavioural patterns.

Furthermore, inconsistencies across different treatment data sources raise challenges in accurately comparing and synthesising data. For instance, helplines utilise varying code labels and categories, as do the wider National Gambling Support Network (NGSN) statistics. This lack of uniformity may pose challenges in accurately comparing and synthesising data from different sources.

Lastly, there is a need for a more specific categorisation of gambling activity by offline/online modes. Moving forward, enhancements in data collection, such as those implemented in the new Gambling Survey for Great Britain (GSGB) by the Gambling Commission, which provides more specificities such as different types of scratch cards and online/in-person modes of a specific gambling type, could help reduce overlap and provide clearer insights into gambling problems across various gambling types.

5.4. Recommendations

The findings of the rapid integrative literature review and the analysis of secondary data relate to various aspects of gambling regulation and policy recommendations in GB. The need for shared customer databases could enhance affordability checks by allowing operators to gain a more holistic overview of a customer's behaviour across different accounts. However, we note that additional protections beyond this are necessary for both online slots and EGMs in land-based venues such as betting shops and casinos, given the high level of harm associated with this type of gambling in young adults.

Based on the findings from this multi-phased project, we make the following recommendations:

Recommendations for new regulations

- **We call for more stringent restrictions on all types of gambling.** No form of gambling is without risk, as revealed by our secondary data analysis. For example, as the national lottery has a large volume of individuals experiencing gambling problems, more needs to be done to educate customers on the risks of gambling and signpost them to support services, and there needs to be a reconsideration around whether the national lottery should come under stricter gambling regulations.
- **Regulations should prioritise reducing the harm caused by EGMs.** Internationally, individuals who report using EGMs also report the greatest harm of those using all products that are currently available. This could include greater restrictions on younger adults – including those who are currently at legal age to use EGMs - as this group are at a disproportionately higher risk of harm.
- **Individuals who gamble should not be treated as a homogenous group, and consideration should be given to potential risks associated with gambling for all individuals.** This is based on our review of the literature and analysis of the secondary data, as evidence suggests that a wide range of gambling activities can lead to varying degrees of harm. This is not to imply that every person who gambles will experience harm, but rather to highlight the importance of proactive measures in identifying and mitigating risks early on. Moreover, this is in contrast to current conceptualisations of gambling harm, which assume that a minimal level of gambling must take place before an individual is considered at risk of harm.
- **Particular attention should be paid to reducing the harm experienced by individuals who gamble heavily**, using methods such as identification from customer databases, as individuals who take part in more than two gambling activities are at disproportionate risk of harm relative to the general population.
- **Intervention and prevention strategies should be personalised where possible.** The secondary data analysis identified that demographics and other characteristics influence risk of gambling harms. Given the data that operators gather about customers who gamble online, it is feasible for personalised strategies to be delivered to online customers.
- **Operators should require customers to complete a standardised measure of 'problem gambling' whenever they create a new customer account.** This recommendation is based on literature review and secondary data analysis evidence indicating that regular assessment can help identify individuals at risk and provide early intervention. **Customers should be required to repeat this measure at regular intervals, such as once a year.** Combined with information about types of gambling, this

will facilitate identification of product risk. Regular assessment using standardised measures like the PGSI is supported by findings that consistent monitoring and tailored interventions can significantly reduce gambling-related harms. This approach is also backed by research showing the importance of continuous data collection to track gambling behaviours and identify risk patterns.

- **We call for regulations limiting gambling-like practices in video gaming, such as loot boxes and skin betting, to individuals aged 18+ years.** Based on our literature review, we conclude that **the interaction between video gaming and gambling should not be ignored.** The evidence suggests that gambling-like practices can contribute to gambling-related harms, particularly among younger individuals. Implementing age restrictions on these features can help mitigate the risks associated with early exposure to gambling-like activities in video games.

Recommendations for future research

- **Operator data should be analysed to provide further insight into the relative risk of different products and identify if any groups are at particular risk of harm.** Data sharing between operators would enhance the potential for this type of identification and prevention work. The type of analysis required would be similar to that already done by gambling operators for targeted marketing purposes, which can be overseen by an independent body and with controls in place to prevent this data being used for marketing purposes.
- **Further research is needed to differentiate gaming machines from each other.** This will help to indicate which is the most harmful amongst different gaming machines and thus help policymakers to consider banning the most harmful type of gaming machines[11].
- **Consideration should be given to not only the form of gambling, but also the device via which people do so.** We call for further research into the relative harm of using different devices (e.g., smartphones, tablets) for online gambling.
- **Further research is needed to protect those individuals who are at greater risk of experiencing gambling harms.** It is vital that policy and practice are based on peer-reviewed research evidence. The funding through which any such research has been conducted should be clear and transparent.
- **Prevalence surveys should be split by online/offline activities to gain a better understanding of the relative risk of different modes of gambling**. Efforts should be made to achieve greater consistency in categorising gambling types across research studies. This entails aligning the categorisation frameworks used by the National Gambling Helpline, Data Reporting Frameworks (DRF), and NHS statistics with the Gambling Survey for Great Britain (GSGB). Such alignment would facilitate easier data triangulation across different sources and enhance the reliability and comparability of findings over time. In the T&S Survey, a balance must be struck to maintain continuity over time while also considering the need to update the codes for greater specificity.
- **Further studies are needed on policy impacts and long-term risks of specific gambling products.** Current literature offers limited insight into other measures in the DCMS White Paper including speed of play, side bets in bingo premises and use of debit cards. More longitudinal studies are also needed to determine the risk of harm from in-

[11] Gaming machine categories: https://www.gamblingcommission.gov.uk/licensees-and-businesses/guide/gaming-machine-categories

play betting and custom betting to inform policy initiatives to reduce harm and understand causality of reforms. There is a need for further research and evidence to understand the impact of policy changes for these suggested gambling reforms. **Future policies should be evaluated to determine their impact** on gambling and the prevalence of gambling harms.

6. Conclusion

In conclusion, our examination of various gambling types through the rapid integrative literature review and secondary data analysis yields pivotal insights for effective regulation and intervention. Notably, Electronic Gaming Machines (EGMs) consistently emerge as the most harmful, indicating the requirement for more stringent regulations. Casino games and certain sports betting forms follow in the hierarchy of harm. While lottery and bingo pose lower risks, our findings stress the absence of entirely risk-free gambling. Particularly when considering the volume of gambling, the national lottery involves the largest number of people experiencing any level of problems and 'problem gambling'. Online platforms generally present higher risks than offline counterparts as in the realm of online gambling, the device used for betting, especially the prevalence of smartphones, significantly influences harm levels.

Moving forward, our recommendations encompass a diversified regulatory approach that recognises the multiple types of gambling and the necessity for activity-specific regulations. Personalised interventions, acknowledging universal risks, and prioritising harm reduction for individuals who gamble are crucial aspects. Specific focus on EGM regulation, exploration of in-play and custom betting risks, and the utilisation of operator data for prevention efforts are paramount. Standardised 'problem gambling' measures for customers, support for longitudinal studies, and regulation of gaming-related gambling practices emphasise a comprehensive strategy involving effort from multiple parties. Additionally, safeguarding at-risk individuals and device-specific research are vital for shaping nuanced, effective policies rooted in transparent and peer-reviewed evidence. Our findings advocate for a dynamic, targeted approach to gambling regulation and intervention, recognising the intricate interplay of various factors influencing harm.

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*National (UK) datasets included in literature review
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8. Appendices

Appendix 1: Rapid academic literature review

Part 1. Research protocol

Aim: Investigate the relative harm of different gambling products.

Research Question: '*What is the relative harm of different gambling products?*'

Inclusion/Exclusion Criteria

We will conduct a rapid integrative literature review (Kazi et al., 2021) following the integrative review methodology (Whittemore & Knafl, 2005) with adjustments (Kangura et al., 2014; Tricco et al., 2015) for a rapid review on articles published in English from 2016 until 30th October 2023. A quick search identified very few academic studies published before 2016. Moreover, online gambling products are continuously developing, and many were developed and introduced after 2016.

Eligible studies will be peer-reviewed academic papers written in the English language, containing primary quantitative research (cross-sectional or longitudinal studies) that quantifies the relative harm of different gambling products.

Inclusion and Exclusion Criteria Outline

Inclusion Criteria	Exclusion Criteria
Quantitative cross-sectional or longitudinal study designs	Studies published before 2020. Very few studies on this topic were conducted before this date, and gambling products have changed significantly in recent years.
Must assess the relative harm of more than one type of gambling	Experiments involving manipulation of the type of gambling. We aim to assess the risk levels of different types of gambling in their natural environments.
Must be written/published in the English language	Studies assessing public perceptions of harm
Must be published between 2020 and 31st December 2023.	Studies involving illegal gambling (including children aged under 18). We aim to assess harm in legal gambling.
	Literature reviews. We aim to assess quantitative data.
	Qualitative studies. We aim to assess quantitative data.

Database Searches

***We* will search the following databases: CINAHL, PsycInfo, Web of Science, Medline and SCOPUS. Authors of studies may be contacted if there is a need for full text or if any clarification on studies is needed.**

Search Strategy

Search String:
"GAMBLING TYPE*" OR "GAMBLING FORMAT" OR "CASINO*" OR "BINGO" OR "BETTING" OR "ARCADE*" OR "GAMING MACHINE" OR "LOTTERY" OR "ONLINE GAMBLING" OR "FIXED ODDS BETTING TERMINALS" OR "FOBT*" OR "POKER" OR "SLOT MACHINES" OR "SPORTS BETTING" OR "HORSE RACES" OR "BLACKJACK" OR "ROULETTE" OR "BETTING EXCHAGES" OR "PARI-MUTUEL BETTING" OR 'FANTASY SPORTS BETTING" OR"SPORTS GAMBLING" OR "SPORTS WAGERING"

AND

"GAMBLING-RELATED HARM" OR "GAMBLING ADDICTION" OR "PROBLEM* GAMBLING" OR "ADVERSE GAMBLING CONSEQUENCES" OR "NEGATIVE GAMBLING OUTCOMES"

<u>Additional Search Methods</u>
We will hand search the following journals: Journal of Gambling Studies, International Gambling Studies, Journal of Gambling Issues.

Part 2: Review method and summary of studies

Our rapid integrative review of academic literature (Kazi et al., 2021) followed the integrative review methodology (Whittemore & Knafl, 2005) with adjustments (Kangura et al., 2014; Tricco et al., 2015). Online gambling products are continuously developing, and the gambling landscape changed considerably with the COVID-19 lockdowns. Hence, we included articles published in English from 2020 until 31st December 2023. A detailed research protocol can be found in Table 1 in Appendix 2.

Eligible studies were peer-reviewed academic papers written in the English language, containing primary quantitative research (cross-sectional or longitudinal studies) that quantifies the relative harm of different gambling products. We searched the following databases: CINAHL, PsycInfo, Web of Science, Medline and SCOPUS. Studies were quality assessed using the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018), see Table 2 in Appendix 2.

Results

Seven potentially relevant studies were identified from Scopus, 517 from PsycInfo, 711 from Medline, 65 from CINAHL and 364 from Web of Science. In total, 497 articles were pulled from the 4 databases with 104 duplicates identified resulting in 393 articles analysed using inclusion/exclusion criteria. For 126 studies, the full article was obtained and read. From this, 42 studies using 39 datasets were deemed eligible. Five studies from three datasets were longitudinal, and the remaining 37 studies were cross-sectional.

Populations were national cohorts or population representative samples in 28 studies, with analyses conducted on those who gambled at least monthly. Other populations studied included a representative sample of young people aged 16-26 (2 studies), a representative sample of male conscripts to the Swiss army (2 studies), migrants to Germany (one study), sports bettors (2 studies), esports bettors and sports bettors (one study), esports bettors and skin gamblers (one study), participants who completed screening for the Swedish National Gambling Helpline (one study), participants registered with gambling specific gambling operators (2 studies), participants recruited via online gambling forums (one study) and a general population sample who had gambled 10+ times in the past 12 months (one study).

Gambling or gambling harms was assessed using the Problem Gambling Severity Index (PGSI; 27 studies), South Oaks Gambling Screen (SOGS; 5 studies) Problem and Pathological Gambling Measure (3 studies from 2 datasets), DSM-5 criteria (3 studies), DSM-IV criteria (2 studies), the Brief Biosocial Gambling Screen (one study), and assessment of high-intensity gambling (defined as depositing more than 5000 SEK (approximately 480 Euro) per week) as a proxy measure for potential problem gambling (one study).

The studies were quality assessed using the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018), which covers both cross-sectional and longitudinal studies. The studies all had clear research questions and the collected data enabled the research questions to be answered. In almost all cases, the sampling strategy was relevant to access the target population, the sample was representative of the target population (most studies used population-representative sampling), the measurements were appropriate (all studies used a standardised assessment of problem gambling), and the statistical analysis was appropriate to answer the research question. However, in six studies the response rate was under 60%, and in another 24 it was not possible to assess response rate.

Part 3. Quality assessment of included academic studies using Mixed Methods Appraisal Tool (MMAT), version 2018

Study Author	**Screening Question 1**	**Screening Question 2**	**Questions Related to Quantitative Descriptive Category of Studies**					**Notes**
			4.1	**4.2**	**4.3**	**4.4**	**4.5**	
Browne et al. (2023)	Y	Y	Y	Y	Y	Can't tell	Y	Secondary data from a range of surveys
Costes et al. (2023)	Y	Y	Y	Y	Y	Can't tell	Y	
Gooding & Williams (2023)	Y	Y	Y	Y	Y	N	Y	46.2% completed FU survey
Greer et al. (2023)	Y	Y	Y	Y	Y	Can't tell	Y	
Grubbs & Kraus (2023)	Y	Y	Y	Y	Y	Y	Y	Sample demographically matched to US norms
Noel et al. (2023)	Y	Y	Y	Can't tell	Y	Can't tell	Y	
Secades-Villa et al. (2023)	Y	Y	Y	Y	Y	N	Y	37.2% response rate
Vieira et al. (2023)	Y	Y	Y	Y	Y	Can't tell	Y	
Wardle & Tipping (2023)	Y	Y	Y	Y	Y	N	Y	56% completed FU survey
Wardle et al. (2023)	Y	Y	Y	Y	Y	Can't tell	Y	Not possible to determine response rate
Williams et al. (2023)	Y	Y	Y	Y	Y	N	Y	46.2% completed FU survey
Cooper et al. (2022)	Y	Y	Can't tell	Can't tell	Y	Can't tell	Y	Response rate and selection criteria not reported
Dowling et al. (2022)	Y	Y	Y	Y	Y	Can't tell	Y	Large amount of missing data
Hing et al. (2022)	Y	Y	Y	Y	Y	N	Y	High nonresponse rate
Lind et al. (2022)	Y	Y	Y	Y	Y	N	Y	51.9% response rate
Phua et al. (2022)	Y	Y	N?	N	Y	N	Y	Convenience sample

Study Author	**Screening Question 1**	**Screening Question 2**	**Questions Related to Quantitative Descriptive Category of Studies**					**Notes**
			4.1	**4.2**	**4.3**	**4.4**	**4.5**	
Tomei et al. (2022)	Y	Y	Y	Y	Y	Y	Y	
Brosowski et al. (2021)	Y	Y	Y	Y	Y	Y	Y	
Currie et al. (2021)	Y	Y	Y	Y	Y	Y	Y	Low nonresponse rate
Diaz & Perez (2021)	Y	Y	Y	Y	Y	Can't tell	Y	Response rate not reported
Greer et al. (2021)	Y	Y	Y	Y	Y	Can't tell	Y	Response rate not reported
Hayano et al. (2021)	Y	Y	Y	Y	Y	Can't tell	Y	
Marmet et al. (2021)	Y	Y	Y	Y	Y	Y	Y	Over 90% response rate
Newall et al. (2021)	Y	Y	Y	Can't tell	Y	Can't tell	Y	Not possible to determine response rate
Oksanen et al. (2021)	Y	Y	Y	Y	Y	Can't tell	Y	
Pallesen et al. (2021)	Y	Y	Y	Y	Y	N	Y	Response rates between 32.7% and 40.6%
Wall et al. (2021)	Y	Y	Y	Y	Y	Y	Y	
Williams et al. (2021)	Y	Y	Y	Y	Y	N	Y	58.4% response rate
Booth et al. (2020)	Y	Y	Y	Y	Y	Can't tell	Y	
Delfabbro et al. (2020)	Y	Y	Y	Y	Y	Can't tell	Y	Secondary data from a range of surveys
Gainsbury et al. (2020)	Y	Y	Y	Can't tell	Y	Can't tell	Y	
Hakansson et al. (2020) - COVID-19	Y	Y	Y	Y	Y	Can't tell	Y	Not possible to determine response rate
Hakansson et al. (2020) - over-indebtedness	Y	Y	Y	Y	N	Can't tell	Y	Non-validated questionnaire used
Ino et al. (2020)	Y	Y	Y	Y	Y	Can't tell	N?	Response rate not reported; chi-square reported as

Study Author	**Screening Question 1**	**Screening Question 2**	**Questions Related to Quantitative Descriptive Category of Studies**					**Notes**
			4.1	**4.2**	**4.3**	**4.4**	**4.5**	
								assessing correlations
Guillou-Landreat et al. (2020)	Y	Y	Y	Y	Y	Can't tell	Y	Response rate not reported
Lelonek-Kuleta et al. (2020)	Y	Y	Y	Y	Y	Can't tell	Y	
Lindner et al. (2020)	Y	Y	Y	Y	Y	Y	Y	Data obtained from an operator; no questionnaires
Lopez-Gonzalez et al. (2020)	Y	Y	Y	Y	Y	Can't tell	Y	Two target populations; response rate not reported
Mathieu et al. (2020)	Y	Y	Y	N	Y	Can't tell	Y	No women recruited
Mazar et al. (2020)	Y	Y	Y	Y	Y	N	Y	Response rate under 80%
Orlowski et al. (2020)	Y	Y	Y	Y	Y	Y?	Y	
Zendle et al. (2020)	Y	Y	Y	Y	Y	Can't tell	Y	Prolific: not possible to determine response rate

How to read tables in Appendices 2, 3, and 5

The predictors (social-economic and demographic characteristics) are displayed on the left side for each regression analysis. In a regression analysis, relative predictors are employed, which involves estimating the effects of each predictor level by comparing it to the 'reference level'. The reference level for each predictor is demoted next to each predictor.

Socio-economic and demographic characteristics significantly associated with each mode of gaming engagement are highlighted in colour. An interpretation of the effect that each predictor has on gaming engagement can be found on the right side of the table. For interpretation, we use a metric known as the odds ratio (OR), which represents the constant effect of a predictor on the likelihood that one outcome (e.g., the level of engagement) will occur. Here we provide adjusted ORs – the odds ratio for having the gaming engagement – while adjusting for the effects of other predictors (e.g., age, education, etc.).

Examples of interpretation of OR: for gender, it refers to the odds of engagement in gaming in males compared to females adjusted to other characteristics.

*A star next to OR indicates that we are more than 95% confident that the OR falls within the true value of the population. When OR is less than 1, we calculated the reciprocal of OR (1/OR) for a better interpretation.

Appendix 2. Summary of regression analyses testing socio-economic and demographic predictors of engaging in different modes of gaming

Gaming online

Predictors	Z	p	Odds ratio	Interpretation
Marital status *(never married)*				
Civil partnership	-0.63	0.52	0.88	
Divorced	2.08	0.03	1.34	
Living as married	0.49	0.62	1.04	Marital status is not significant predictor of gaming online
Married	-1.6	0.10	0.88	
Separated	-0.74	0.46	0.85	
Widowed	-0.31	0.75	0.93	
Gender *(female)*				
male	3.95	< .001	1.27*	Males have 1.27 odds of engaging in gaming online compared to females
Age groups *(18-34y.o.)*				
35-54y.o.	-3.55	< .001	0.78*	Young adults have 1.28 odds of engaging in online gaming compared to mid-aged and 2.4 odds compared to individuals 55+.
55+y.o.	-7.17	< .001	0.42*	
PGSI score groupings *(PGSI 0)*				
PGSI1_2	20.41	< .001	4.67*	The likelihood of engaging in online gaming individuals with low gambling problems is 4.67 times higher compared to people experiencing no gambling problems (PGSI 0). In the PGSI3_7 and PGSI8+ the likelihood is 8.57 and 9.8 respectively.
PGSI3_7	24.98	< .001	8.57*	
PGSI8+	26.18	< .001	9.8*	

Employment *(retired)*				
Student	-0.63	0.53	0.88	Being a student cannot reliably predict engagement in online gaming
Not working	3.48	< .001	5.19*	The likelihood of engaging in online gaming of not working people is 5.19 higher compared to retired individuals.
Unemployed	2.18	0.029	1.45	Being an unemployed cannot reliably predict engagement in online gaming
Working	2.62	0.009	1.45*	Working people have 1.45 odds of engaging in online gaming compared to retired individuals.
Education *(none)*				
A level	2.06	0.04	1.44	Education level is not reliable predictor of engaging in online gaming
DK	1.66	0.09	1.34	
Degree	0.12	0.90	1.02	
GCSE	1.28	0.19	1.26	
Gross household *(*Up to £20,000 per year)				
£20,000 - £39,000	1.15	0.25	1.11	Gross household income is not reliable predictor of engaging in online gaming
£40,000 - £59,000	2.32	0.02	1.27	
£60,000 & above	1.85	0.06	1.22	
Gaming in person				
Predictors	**Z**	**p**	**Odds ratio**	
Marital status *(never married)*				
Civil partnership	3.19	0.001	1.66*	People in civil partnership have 1.66 odds of engaging in gaming in person compared to those who has never been married
Divorced	-0.15	0.88	0.98	
Living as married	1.34	0.18	1.11	
Married	1.16	0.24	1.08	
Separated	-0.43	0.66	0.92	
Widowed	0.98	0.32	1.19	
Gender *(female)*				
male	6.52	< .001	1.41*	Males have 1.41 odds of engaging in gaming in person compared to females
Age group *(18-34y.o.)*				
35-54y.o.	-5.65	< .001	0.71*	Young adults have 1.41 odds of engaging in gaming in person compared to mid-aged people and 2.22 odds compared to people 55+
55+y.o.	-7.74	< .001	0.45*	
PGSI score groupings *(PGSI0)*				
PGSI1_2	17.44	< .001	3.35*	People experiencing high-risk gambling problems have 15.91 odds of engaging in gaming in person compared to people with no risk of gambling problems. People with moderate-risk and low-risk of gambling problems have 6.55 and 3.35 odds respectively.
PGSI3_7	23.68	< .001	6.55*	
PGSI8+	38.37	< .001	15.91*	
Employment *(retired)*				
Student	1.32	0.18	1.23	
Not working	-0.71	0.47	0.48	
Unemployed	0.97	0.33	1.15	
Working	2.92	0.004	1.39*	Working individuals have 1.39 odds of engaging in gaming in person compared to retired individuals
Education *(none)*				

A level	1.97	0.05	1.34	Education level is not reliable predictor of engaging in gaming in person
DK	1.46	0.14	1.24	
Degree	0.06	0.95	1.01	
GCSE	1.07	0.28	1.18	
***Gross household** (Up to £20,000 per year)*				
£20,000 - £39,000	0.56	0.57	1.05	Gross household income is not reliable predictor of engaging in gaming in person
£40,000 - £59,000	0.76	0.44	1.07	
£60,000 & above	1.81	0.07	1.19	
Gaming both				
Predictors	**Z**	**p**	**Odds ratio**	
***Marital status** (never married)*				
Civil partnership	0.4	0.68	1.05	
Divorced	0.99	0.32	1.06	
Living as married	6.08	< .001	1.28*	People living as married or married have greater odds of engaging in the 'both' mode of gaming than never been married (odds 1.28 and 1.1 respectively)
Married	2.6	0.009	1.1*	
Separated	1.22	0.22	1.12	
Widowed	-0.67	0.50	0.95	
***Gender** (female)*				
male	-20.51	< .001	0.58*	Females have 1.72 odds of engaging in this mode of gaming compared to males
***Age groups** (18-34y.o.)*				
35-54y.o.	-4.54	< .001	0.86*	Young adults have 1.16 odds of engaging in gaming in person compared to mid-aged people and 1.75 odds compared to people 55+
55+y.o.	-11.77	< .001	0.57*	
***PGSI score groupings** (PGSI 0)*				
PGSI1_2	24.21	< .001	2.57*	The likelihood of engaging individuals experiencing different levels of gambling problems is relatively consistent across PGSI1-2 – 8+ score groupings (compared to people with no gambling problems) with odds of 2.57, 3.67 and 2.99
PGSI3_7	23.28	< .001	3.67*	
PGSI8+	18.38	< .001	2.99*	
***Employment** (retired)*				
Student	-1.51	0.13	0.88	
Unemployed	5.13	< .001	1.4*	Unemployed and working people have 1.4 and 1.54 odds of engaging in this mode of gaming compared to retired people
Working	9.09	< .001	1.54*	
***Education** (none)*				
A level	-3.27	0.001	0.81*	The individuals with A level, DK and degree have 1.23, 1.35 and 1.96 odds (respectively) of engaging than people who have no education.
DK	-4.82	< .001	0.74*	
Degree	-10.6	< .001	0.51*	
GCSE	-1.47	0.14	0.91	
***Gross household** (Up to £20,000 per year)*				
£20,000 - £39,000	-1.3	0.195	0.95	
£40,000 - £59,000	-0.21	0.836	0.99	
£60,000 & above	-4.4	< .001	0.8*	People with gross household of £20,000 and above have 1.25 odds of engaging in this mode of gaming compared to people with income of £60,000 and above

N.B. Sexuality, ethnicity and religion did not predict any of the gaming modes and were removed from the analysis to improve the model fit.

Appendix 3. Summary of regression analyses testing socio-economic and demographic predictors of engaging in different modes of betting activities.

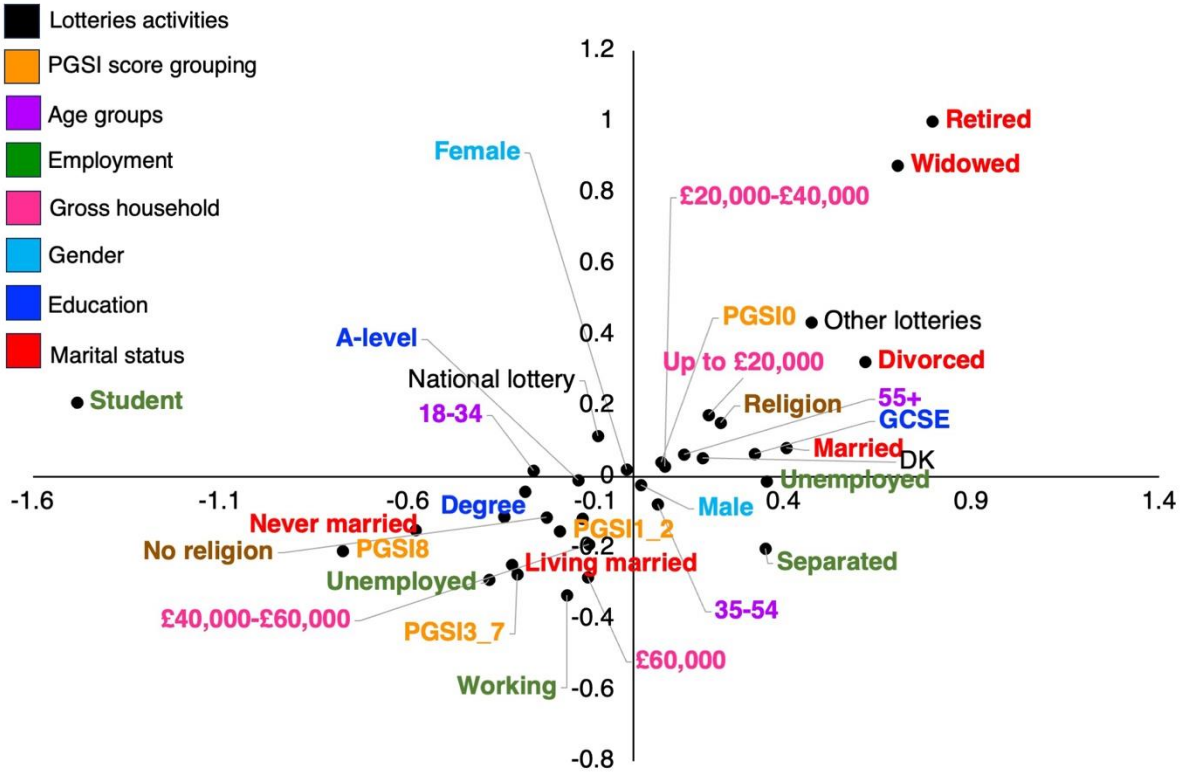
Betting in person **Predictors**	**Estimate**	**Z**	**p**	**Odds ratio**	**Interpretation**
Marital status *(never married)*					
Civil partnership	0.06	0.31	0.756	1.06	Marital status is not reliable predictor of betting in person
Divorced	-0.23	-1.72	0.085	0.79	
Living as married	-0.15	-1.71	0.087	0.86	
Married	-0.06	-0.84	0.401	0.94	
Separated	-0.82	-3.15	0.002	0.44	
Widowed	0	0	0.997	1	
Gender *(female)*					
male	-0.66	-11.6	< .001	1.93*	Males have 1.93 odds of betting in person compared to females
Age group (*18-34y.o.)*					
35-54y.o	0.06	0.78	0.437	1.06	
55+y.o.	0.43	4.63	< .001	1.54*	People of 55+ y.o. have 1.54 odds of betting in person compared to young adults
PGSI groups (*PGSI0*)					
PGSI1_2	0.77	10.2	< .001	2.16	The odds of having gambling problems are increasing with engaging in betting in person
PGSI3_7	1.1	11.33	< .001	3.01	
PGSI8	1.97	23.44	< .001	7.16	
Employment (retired)					
Student	0.31	1.97	0.048	1.37	
Unemployed	0.14	1	0.318	1.15	
Working	0.39	4.43	< .001	1.48*	Working individuals have 1.48 odds of betting in person compared to retired people
Gross household (*up to £20,000 per year*)					
£20,000 - £39,000	0.12	1.44	0.15	1.12	People with gross household of £40,000-£59,000 have 1.24 odds of engaging in in-person betting compared to people with income of up to £20,000 per year. The odds of people with gross household of £60,000 and above is 1.48
£40,000 - £59,000	0.21	2.38	0.017	1.24*	
£60,000 and above	0.39	4.31	< .001	1.48*	
Education (*None*)					
DK	-0.2	-2.62	0.009	0.82	Respondents who indicated no education have 1.35 odds in engaging in in-person betting compared to people holding a degree
Degree	-0.3	-4.19	< .001	0.74*	
GCSE	-0.02	-0.22	0.826	0.98	
A level	-0.22	-1.61	0.107	0.8	
Religion (*no religion*)					
Any religion	0.49	8.89	<.001	1.64*	The odds of holding any religion believes are 1.64 times more of having no religious believes
Betting online **Predictor**	**Estimate**	**Z**	**p**	**Odds ratio**	
Marital status *(never married)*					
Civil partnership	-0.43	-3.15	0.002	0.65*	

Divorced	0.02	0.29	0.772	1.02	
Living as married	0.07	1.58	0.115	1.08	People who are in civil partnership or
Married	-0.12	-2.94	0.003	0.88*	married have 1.54 and 1.14 odds of
Separated	-0.04	-0.36	0.718	0.96	engaging in online betting than people
Widowed	-0.14	-1.19	0.234	0.87	who has never been married
Gender *(women)*					
male	1.02	30.79	< .001	2.79	Males have 2.79 odds of engaging in online betting compared to females
Age group *(18-34y.o)*					
35-54y.o	-0.07	-1.69	0.091	0.94	
55+y.o.	-0.47	-8.1	< .001	0.63*	Young adults have 1.59 odds of engaging in online betting compared to individuals of 55+
PGSI groups *(PGSI0)*					
PGSI1_2	1.27	30.71	< .001	3.57*	The odds of experiencing moderate risk
PGSI3_7	1.55	26.96	< .001	4.7*	of gambling problems is 4.7 times more
PGSI8	1.14	18.15	< .001	3.14*	of having no problems, 1.13 times more than people experiencing low-risk level of problems and 1.56 times more than people experiencing high-risk gambling problems
Employment *(retired)*					
Student	0.21	2.13	0.033	1.23	
Not working	0.6	1.56	0.119	1.82	
Unemployed	0.13	1.51	0.132	1.14	
Working	0.37	6.17	< .001	1.45*	The odds of working people are being engaged in online betting is 1.45 greater compared to retired individuals
Gross household *(Up to £20,000 per year)*					
£20,000 - £39,000	0.27	5.68	< .001	1.31*	The odds of people engaging in online
£40,000 - £59,000	0.46	8.73	< .001	1.58*	betting tends to increase with increasing
£60,000 and above	0.59	11.11	< .001	1.8*	their gross household (odds of 1.31, 1.58, 1.8 for every £20,000 increase respectively)
Education *(none)*					
DK	-0.16	-3.37	< .001	0.85*	Individuals indicating no at have 1.18
Degree	-0.22	-5.34	< .001	0.8*	and 1.25 odds of engaging in online betting compared to people holding a degree or DK
GCSE	0	0.06	0.953	1	
A level	-0.11	-1.24	0.213	0.9	

N.B. Sexuality and ethnicity did not predict any of the betting modes and was removed from the analysis to improve the model fit.

Appendix 4. Multiple associations between lotteries and socio-economic characteristics.

The figure illustrates a lack of significant associations between lottery participation (including the national lottery and other lotteries such as charity-based ones) and socio-economic or demographic traits. It appears that individuals who partake in other lotteries tend to be retired and widowed. Most characteristics are positioned near the origin (the intersection of the X and Y axes), suggesting these characteristics are likely indistinct.



Appendix 5. Summary of regression analyses testing socio-economic and demographic predictors of engaging in different modes of betting activities.

National lottery **Predictor**	**Estimate**	**Z**	**p**	**Odds ratio**	**Interpretations**
Marital status (*never married*)					
Civil partnership	0.02	0.2	0.83	1.1	Marital status is not reliable predictor of engaging in national lottery
Divorced	0.07	1.39	0.16	1.08	
Living as married	0.11	2.89	0.04	1.12	
Married	0.07	2.29	0.02	1.16	
Separated	0	0	0.99	0.95	
Widowed	-0.13	-2.04	0.04	1.39	
Gender *(female)*					
male	0.21	1.95	0 .05	0.92	
Age group *(18-34 y.o.)*					
35-54 y.o.	0.81	25.33	< .001	1.55	Individuals in their middle age and those aged 55 and over are more inclined to participate in the national lottery compared to younger adults, with respective odds of 1.55 and 2.35
55+ y.o.	0.96	22.1	< .001	2.35	
PGSI score groupings *(PGSI0)*					
PGSI1_2	0.73	16.96	< .001	1.36	The odds of experiencing high-risk gambling problems are 2.3 times less likely than experiencing no gambling problems.
PGSI3_7	0.58	9.3	< .001	1.69	
PGSI8	-0.22	-3.5	< .001	2.3	
Education *(none)*					
A level	0.06	0.96	0.33	1.07	Education is not reliable predictor of engaging in national lottery
DK	0	0.06	0.95	1.11	
Degree	-0.18	-3.17	0.02	0.96	
GCSE	0.05	0.84	0.40	1.09	
Gross household *(Up to £20,000) per year*					
£20,000 - £39,000	0.22	6.2	< .001	1.17*	Engagement in the national lottery increases with increasing gross household.
£40,000 - £59,000	0.38	9.01	< .001	1.2*	
£60,000 and above	0.5	11.12	< .001	1.16*	
Employment *(retired)*					
Student	-0.8	-10.35	< .001	0.48*	Retired people are more likely to engage in the national lottery than students and unemployed individuals (odds are 2.1 and 1.6 respectively). Working people have 1.2 odds of engaging in the national lottery compared to retired individuals
Unemployed	-0.23	-3.87	< .001	0.62*	
Working	0.27	6.97	< .001	1.2*	
Religion *(No not belong to any religions)*					
Any religion	-0.07	-2.74	0.006	1.09*	The odds of holding no religious believes is 1.09 times likely than having any religious believes
Other lotteries					
Marital status *(never married)*					
Civil partnership	0.09	0.7	0.48	1.02	
Divorced	0.08	1.26	0.20	1.08	
Living as married	0.11	2.26	0.02	1.12	

Married	0.15	3.56	< .001	1.08*	Married people are more likely to engage in other lotteries compared to never married individuals
Separated	-0.05	-0.45	0.656	1	
Widowed	0.03	1.63	0 .01	0.88	
Gender *(female)*					
male	-0.3	-10.49	< .001	1.27*	Females are more likely to engage in other lotteries than males
Age groups *(18-34 y.o.)*					
35-54 y.o.	0.44	9.85	< .001	2.25*	Individuals in their mid-life and those over the age of 55 tend to be more likely to play other lotteries in comparison to younger adults, with their respective odds standing at 2.25 and 2.62
55+ y.o.	0.85	15.59	< .001	2.62*	
PGSI score grouping *(PGSI0)*					
PGSI1_2	0.31	6.4	< .001	2.07*	The likelihood of engaging individuals experiencing different levels of gambling problems is decreasing across PGSI1-2 – 8+ score groupings (compared to people with no gambling problems) with odds of 2.07, 1.78 and 0.8
PGSI3_7	0.52	7.62	< .001	1.78*	
PGSI8	0.83	11.64	< .001	0.8*	
Education *(none)*					
A level	0.06	0.94	0.35	1.06	Education is not reliable predictor of engaging in other lotteries
DK	0.1	1.58	0.11	1	
Degree	-0.04	-0.64	0.52	0.84	
GCSE	0.08	1.2	0.23	1.05	
Gross household *(Up to £20,000) per year*					
£20,000 - £39,000	0.15	3.56	< .001	1.25*	Engagement in other lotteries including charity increases compared to income of up to £20,000
£40,000 - £59,000	0.19	3.6	< .001	1.46*	
£60,000 and above	0.15	2.7	0.007	1.65*	
Employment *(retired)*					
Student	-0.74	-6.3	< .001	0.45*	Retired individuals are 2.22 time more likely to engage in other lotteries compared to students
Unemployed	-0.48	-6.15	< .001	0.8*	Retired people are 1.25 time more likely to engage in other lotteries compared to unemployed
Working	-0.17	-3.91	< .001	1.32*	Retired people are 1.32 time more likely to engage in other lotteries compared to working individuals
Religion *(No not belong to any religions)*					
Any religion	0.09	3.06	0.02	0.94	

N.B. Sexuality and ethnicity did not predict any of the betting modes and was removed from the analysis to improve the model fit.

Appendix 6. Summary of multinomial logistic regression analysis testing whether engaging in individual gaming activity can predict the level of alcohol consumption measures by AUDIT (The Alcohol Use Disorder Identification Test).

How to read Appendix 6. Significant predictors (gambling activities) are highlighted in blue. The baseline for the AUDIT grouping is those groups with low alcohol consumption (below a score of 5). A negative figure (minus) in the 'Estimate' measurement shows that alcohol consumption decreases with heightened participation in a corresponding gambling activity (such as the national lottery). A positive estimate (e.g., Gaming machines at bookmakers) suggests that alcohol consumption escalates with increased involvement in gambling.

Predictor	χ^2	*p*	AUDIT group	Estimate	Z	p	Odds ratio	95% CI
National lottery	31.93	< .001						
			Increased	-0.39	-5.46	< .001	0.68	[0.59, 0.78]
			Higher	-0.26	-3.04	0.002	0.77	[0.65, 0.91]
Other lotteries	0.89	0.64						
Scratch cards	0.22	0.89						
Gaming machines at bookmakers	12.4	0.002						
			Increased	0.5	3.38	<.001	1.64	[1.23, 2.19]
			Higher (ns)*					
Fruit and slot machines	14.5	< .001						
			Increased	0.28	2.44	0.02	1.33	[1.06, 1.67]
			Higher	0.48	3.65	<.001	1.62	[1.25, 2.10]
Bingo	2.05	0.35						
Casino	11.51	0.003						
			Increased	0.49	3.39	<.001	1.63	[1.23, 2.16]
			Higher (ns)*					
Online casino games	2.36	0.30						
Online poker	8.51	0.01						
Betting races online	14.04	< .001						
			Increased	0.24	2.28	0.02	1.03	[1.03, 1.57]
			Higher	0.42	3.61	<.001	1.53	[1.21, 1.92]
Betting races in person	11.31	0.004						
			Increased	0.45	2.89	0.004	1.56	[1.15, 2.12]
			Higher	0.48	2.75	0.006	1.62	[1.15, 2.28]

Betting football online	27.36	< .001						
			Increased	0.2	2.14	0.03	1.22	[1.02, 1.45]
			Higher	0.55	5.27	<.001	1.73	[1.43, 2.12]
Betting football in person	2.54	0.28						
Betting sports online	4.3	0.11						
Betting sports in person	3.16	0.20						

ns* indicates non-significant estimate.