AUT GAMBLING & ADDICTIONS RESEARCH CENTRE

PRELIMINARY INVESTIGATION OF PATTERNS OF ONLINE GAMBLING AND F2P GAMING ENGAGEMENT AND HARM IN NEW ZEALAND

FINAL REPORT

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Disclaimer

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 EXECUTIVE SUMMARY

Background and literature review

Online gambling and online gaming have converged, with online social videogames (also known as free-to-play [F2P] games) integrating gambling-like elements and including small monetary transactions (microtransactions), and with gambling activities incorporating more gaming-like elements. As with traditional gambling, players can experience financial and other harms from these activities. International studies have indicated that young people, people with low income, and indigenous and migrant populations have a higher risk of harm from these hybrid gambling-F2P gaming activities. However, particularly in New Zealand, consequences of engagement in F2P gaming and concurrent online gambling engagement, and whether certain populations have higher risk, are not well understood. Therefore, our study was conducted to explore:

1. Sociodemographic and behavioural characteristics in monetary engagement in F2P gaming and online gambling (i.e. frequency of engagement, expenditure, and influencing factors).
2. How engagement relates to F2P gaming and gambling risk and harm.

People who played videogames that do not provide microtransaction opportunities were not the focus of this study.

Methods

A short online survey was conducted with the assistance of Horizon Research, a New Zealand based online panel provider, who sent the survey to five population representative research panels including a Māori panel. To take part in the survey, participants had to be 18 years or older, currently living in New Zealand, and be an online gambler[1] and/or a F2P gamer who spent money on microtransactions in the prior year.

Online gamblers were defined as spending real money on online gambling (lottery and scratch cards, sports and track betting, poker or other card games, casino games and electronic gaming machines).

Online F2P players were defined as playing F2P games on a website, app, computer, game console, mobile device, tablet, or social media, and making monetary payments during games to gain an item, obtain privileges, advance to a higher level, increase chances of winning or make faster progress in the game.

A total of 4,180 adults completed the survey and were categorised into three groups:

1. Online gambler: Gambled for money online but did not participate in F2P games in the prior year.
2. F2P gamer: Engaged in online F2P gaming and spent money on microtransactions in the prior year but did not gamble online.
3. Mixed gambler-F2P gamer: Participated both in online gambling and in online F2P gaming and spent money on microtransactions in the prior year.

[1] Land-based gamblers were not precluded from participation as long as they also met the criteria for being an online gambler and/or an online F2P gamer.

Results

Sociodemographic characteristics of monetary engagement in F2P gaming and online gambling

A higher percentage of males were online gamblers (55.5%) or mixed gambler-F2P gamers (56.1%). A slightly higher percentage of females (53.4%) were F2P gamers.

Twenty-eight percent of F2P gamers and 29.5% of mixed gambler-F2P gamers were aged 18 to 34 years, compared with only 12.8% of online gamblers of whom 47.2% were aged 55 years or older.

Māori, Pacific and Asian people were more likely to be mixed gambler-F2P gamers compared with being online gamblers or F2P gamers.

Behavioural characteristics of monetary engagement in F2P gaming and online gambling

Online gambling and F2P gaming were mainly accessed via personal smartphones, personal laptops and personal tablets. Some participants used a personal console or shared devices to access these activities.

Gambling

Mixed gambler-F2P gamers generally exhibited riskier gambling behaviours than online gamblers.

A higher percentage of mixed gambler-F2P gamers took part in each gambling activity except for purchasing Lotto tickets, which was similar between the groups. The most common online gambling activities (apart from Lotto) were scratch tickets followed by sports betting and electronic gaming machines.

Forty-four percent of online gamblers and 46.9% of mixed gambler-F2P gamers were regular gamblers (gambled once a week or more often), with less than 4% gambling daily. Most online gamblers and mixed gambler-F2P gamers also gambled at land-based venues but 53.6% of online gamblers and 59.9% of mixed gambler-F2P gamers gambled more online than on land-based gambling. A substantially higher percentage of mixed gambler-F2P gamers spent more time gambling online than intended; 27% compared with 11% of online gamblers.

Fifty-six percent of online gamblers only gambled on one activity and a further 38.9% gambled on two or three activities. For mixed gambler-F2P gamers, 34.4% gambled on one activity and 45.8% gambled on two to three activities. A similar finding was noted for time spent gambling in a typical session with a higher proportion of mixed gambler-F2P gamers gambling for longer sessions than online gamblers. Typical monthly expenditure on online gambling activities was similar between gamblers and mixed gambler-F2P gamers with the highest proportions (about 28%) spending in the $21 to $50 range.

Two broad clusters of online gamblers were identified:

1. Online gamblers who had not tried to change their gambling behaviour in the prior year and had typical online gambling sessions of less than 15 minutes.
2. Mixed gambler-F2P gamers who had tried to change their gambling behaviour in the prior year and had typical online gambling sessions of more than 15 minutes.

Māori specific findings

Māori participated in a greater number of online gambling activities, gambled more frequently, spent more on gambling and had longer online gambling sessions than non-Māori. Additionally, Māori were more likely to engage in online gambling for virtual (play) money and for longer sessions than non-Māori.

F2P gaming

Mixed gambler-F2P gamers generally exhibited riskier gaming behaviours than F2P gamers.

A higher proportion of F2P gamers participated in regular (weekly or more often) F2P gaming. Expenditure per microtransaction was generally similar between F2P gamers and mixed gambler-F2P gamers but a higher proportion of F2P gamers spent in the $3 to $4.99 range on microtransactions and $10 or more per transaction on loot boxes. However, with a small sample size, the latter finding should be considered cautiously.

Mixed gambler-F2P gamers tended to have similar gaming session length to F2P gamers, generally gaming for up to two hours in one session. However, 20.5% of F2P gamers and 23.1% of mixed gambler-F2P gamers gamed for longer sessions extending to 10 hours or more.

Māori specific findings

Māori had longer F2P gaming sessions than non-Māori, although the frequency of spending money on microtransactions and purchasing loot boxes was similar.

Relationship of engagement patterns to F2P gambling and gaming risk and harm

Gambling and F2P gaming risk and harm

Thirty-four percent of gamblers and 58.9% of mixed gambler-F2P gamers were classified as risky gamblers (low risk, moderate risk or problem gamblers). Participants who only gambled on Lotto had lower risk compared with other gamblers. The prevalence of risky F2P gaming was higher, with 59% of F2P gamers and 74% of mixed gambler-F2P gamers classified as risky gamers.

Mixed gambler-F2P gamers experienced more gambling and gaming harm than online gamblers or F2P gamers, with higher proportions of the former reporting multiple harms. Although reduced spending money was the most often reported harm, a range of negative effects was identified including mental health and physical health issues; sleep issues; detriments to relationships; detriments to daily living such as daily tasks, hobbies and lifestyle habits; reduced living conditions, and detriments to employment or education. Higher proportions of mixed gambler-F2P gamers reported each negative consequence (apart from financial effects) compared with online gamblers.

Mixed gambler-F2P gamers were slightly more likely than online gamblers to report that negative effects were mainly due to online gambling, with much smaller proportions of both groups identifying land-based gambling as the main cause of negative effects. Online Lotto was the most common reported activity causing gambling harm both for gamblers and mixed gambler-F2P gamers. When Lotto-only gamblers were removed from the analysis, online Lotto

remained the most common reported activity causing harm amongst gamblers, though online gaming machines became the most reported harmful activity amongst mixed gambler-F2P gamers.

Thirty-one percent of gamblers and 54% of mixed gambler-F2P gamers who had tried to reduce or quit gambling, resumed gambling when they received inducements (e.g. bonus bets) from a gambling provider or in response to general advertisements from gambling providers.

Māori specific findings

Māori respondents had more than twice the risk for moderate risk/problem gambling and for experiencing gambling harm than non-Māori. There was no difference between Māori and non-Māori for moderate risk/problem F2P gaming or F2P gaming harm. Māori were twice as likely to engage in virtual gambling than non-Māori and for longer sessions.

Factors associated with increased and decreased gambling and F2P gaming risk and harm

Gambling

After accounting for interacting/confounding influences, ethnicity was found to be strongly associated both with being a moderate risk/problem gambler and with gambling harm. Compared with European/Other ethnicity, Māori ethnicity was associated with increased risk of gambling harm (but not with being a moderate risk/problem gambler), while Asian ethnicity was associated both with being a moderate risk/problem gambler and with gambling harm.

Older age and higher annual personal income were strongly associated with *lower* gambling risk and gambling harm. Participants aged 35 years and older were less likely to be a moderate risk/problem gambler, whilst participants aged 25 years and older were less likely to experience gambling harm, compared with young adults (18 to 24 years). An annual personal income of $50,001 or more per year was associated with lower likelihood of being a moderate risk/ problem gambler and with gambling harm, compared with earning $20,000 or less.

Two other demographic factors were weakly associated with gambling harm but not with being a moderate risk/problem gambler. Females had a lower risk of harm than males, whilst participants who were employed had an increased risk. Being a mixed gambler-F2P gamer was also weakly associated with increased risk of moderate risk/problem gambling and gambling harm. The weak nature of these associations means these findings should be considered cautiously.

Increases in gambling behaviours were associated both with increased risk of being a moderate risk/problem gambler and with gambling harm. These included gambling on a higher number of land-based activities, and increased frequency of online gambling for either virtual or real money.

F2P gaming

After accounting for interacting/confounding influences, regular (weekly or daily) loot box purchasing was strongly associated with both with being a moderate risk/problem gamer and

gaming harm, as were long gaming sessions. Spending between $5 and $9.99 per micro-transaction was also associated with increased risk of being a moderate risk/problem gamer.

Conclusion and implications

In our study of adults who gambled online and/or participated in online F2P gaming and spent money on microtransactions, a higher proportion of participants reported online gambling than F2P gaming, suggesting that online gambling should remain a priority in efforts to reduce harm.

Participants who engaged both in online gambling and F2P gaming (mixed gambler-F2P gamers) exhibited both gambling and gaming behaviours that increased risk of being a moderate risk/problem gambler/gamer, and increased risk of harm from both gambling and F2P gaming, compared to people who only gambled online or who only played F2P games. This indicates that public health harm minimisation activities and clinical interventions should be targeted not only to people who gamble but also focus on those gamblers who participate in F2P gaming and spend money in those games, particularly on loot boxes, given their potential to lead to migration to gambling behaviours.

Additional focus must remain on Māori, Pacific and Asian populations as well as younger adults who are disproportionately affected by F2P gaming harms as well as gambling harms.

2 BACKGROUND

Convergence is blurring delineation of online gambling and online gaming, marked by an increasing intersection of online technologies with everyday life. As well as games that integrate gambling elements, mechanics or themes, gambling activities are incorporating more game-like elements (Kolandai-Matchett & Abbott, 2021). The effect is a rapidly changing confluence of gaming-gambling elements, producing a wide range of highly accessible products and activities for which vulnerable individuals may develop problematic habits of play and experience harm (King et al., 2015). Free-to-play games (F2P, also known as 'social games') have strong points of convergence with gambling, adopting a business model focused on profits and the use of behavioural mechanisms to attract and retain high spenders (Cassidy, 2013). While free to download and play online, F2P games generate income through monetary microtransactions where users may purchase virtual goods (e.g. avatars, power-up or speed-up items, extensions, add-ons or updates) which may, or may not, provide an in-game advantage. Often, a user is encouraged to spend multiple small amounts of money to make unimpeded progress in the game. An example is loot boxes that involve purchase of random virtual goods (like a structured lucky dip), which have drawn attention from psychologists due to the addictive potential of exposure to frequent opportunities to purchase random in-game rewards (Drummond & Sauer, 2018; Drummond et al., 2020a). Loot boxes are highly prevalent in F2P games with between 36% and 59% of games played on personal computers or mobile devices, respectively, containing them (Zendle et al., 2020). The combined use of online social worlds facilitated by F2P games to manipulate and encourage spending has been flagged as a public health risk with links to gambling products and industries (Cassidy, 2013). Yet, consequences of different levels of engagement in online gaming and gambling are not well understood (Potenza, 2014). Researchers have speculated that impacts on health and wellbeing are likely to be more negative for some population groups (e.g. socioeconomically disadvantaged) and Māori and Pacific people tend to be overrepresented in these groups (Abbott et al., 2020). Thus, exploring associations between F2P gaming and online gambling, and the implications of convergence for health outcomes and harm prevention and reduction is urgently needed and provided the focus for this study.

This study's design was based on that developed by the E-Games International Research Network to conduct research to explore online gambler and F2P gamer behaviours in different countries, allowing comparable global research to examine intersection of online gambling and F2P gaming. Six countries in North America and Europe took part in the initial research, each tailoring their study for the context of their country. Full details are available on the E-Games International Research Network website (n.d.). The study detailed in this report used a modified version of the E-Games Network survey and methodology, tailored for the New Zealand context, to provide information specific to this country that will allow valid comparison to other E-Games Network research findings in the future. This study's findings also add Antipodean knowledge to the North American and European findings. Note that many people play videogames that do not provide microtransaction opportunities; those games and people were not the focus of this study.

3 BRIEF LITERATURE REVIEW

This chapter comprises a brief review of relevant literature to provide a summary of existing research relating to online gambling and F2P gaming. In this review, we highlight key research on the topic and provide context for our study. As such, this chapter should not be considered comprehensive in its detail of existing literature.

3.1 Introduction

The delineation between online gambling and online gaming activities has blurred. Both are incorporating mechanisms formerly associated with the other, with various online gambling activities use gaming-like visual cues, and online games incorporating chance-based opportunities for financial transactions (Cassidy, 2013). As these hybrid gaming-gambling activities have developed, difficulties in assessing the associated harms for players, and in developing appropriate regulatory responses have arisen. This brief review of the literature first outlines how these activities converge. It then covers the limited information available on the harms caused by these activities, and the sociodemographic groups most burdened. Then, although engagement in both activities is shown to be rising, international attempts at controlling associated harms are noted as being insufficient. Initiatives targeting harmful online gambling and online gaming behaviours have been undertaken with mixed results. However, a small number of regulatory responses that have targeted the exploitation of young, indigenous, and migrant people by gambling and gaming industries are outlined as possible alternative (or complementary) measures.

The relevance of these findings to the New Zealand context is also detailed. First, the national online gambling and online gaming landscape is described. Next, the lack of information regarding which populations engage in these activities, and the harms that they experience is highlighted, to justify future research on this topic.

Relevant literature was searched for via public and university accessed databases. Studies were included if they pertained to the convergence between online gaming and online gambling or had relevance to this topic. The search was not limited to a particular time frame; studies were included based on the insights they provided. Google Scholar, MEDLINE and Scopus were searched for academic publications. Grey literature (e.g. government reports and websites) was examined if it pertained to relevant research. Further publications were found through citation mining. Forty-seven articles were included in this review and are indicated with an asterisk in the *References* section.

3.2 International developments

3.2.1 Convergence of gambling and gaming

Gambling involves the wagering of currency, either real money or virtual currency such as chips or coins (Fiedler et al., 2024). Virtual currency used for online gambling may be referred to as Real Money Gambling (RMG) or Simulated Gambling (SG), depending on what is wagered. RMG involves the use of cash to buy virtual currency, whereas SG requires wagering something with no monetary value outside the activity, but which quantifies or rewards performance.

SG is easily accessible, and participating individuals represent potential customers for RMG operators. SG can be used as a trojan horse to initiate RMG as SG often does not meet legal criteria to be considered gambling, allowing for regulatory measures to be circumvented (Cassidy, 2013). SG vendors are, therefore, able to create an illusion of control for players which they could not through RMG; they may automate a loss phase to be followed by a large win to boost a player's morale or exaggerate winnings. Armstrong et al. (2018) argued that this fosters a positive perception of gambling, facilitating players to transition to RMG as they become desensitised to the risk of monetary loss. Further, Fiedler et al. (2024) noted that participants' inability to distinguish between the two forms of gambling can facilitate migration towards wagering real money. In a study of 945 people who engaged in RMG online, 77% also participated in SG (McBride & Derevensky, 2009).

Free-to-play (F2P) online games are increasingly convergent with online gambling, targeting behavioural mechanisms which encourage wagering (Cassidy, 2013). While initially free to download, F2P games encourage monetary microtransactions whereby players purchase virtual goods (such as new avatars, upgrades to an existing avatar, power-up or speed-up items, extensions, add-ons, or updates) (von Meduna et al., 2019). These may create an in-game advantage over non-paying players. For example, a player could purchase a loot box, whereby money is spent to obtain a randomly selected virtual item. This process is analogous to a structured lucky dip (Drummond et al., 2020b). von Meduna et al. (2019) described F2P games, therefore, as being gambling-like products due to the inclusion of loot boxes, and the associated introduction of something of value (in this case, currency) being risked.

Kolandai-Matchett and Abbott (2022) also noted that numerous commercial games incorporate gambling simulation elements and casino-style activities. Many of these games are classified as being suitable for young people, and some display content which is specifically appealing to a young population, suggesting targeted advertising. This F2P model has created sustained revenue streams for online gaming companies. Games are less often standalone commodities (for which, there is a one-off payment), rather, they have become platforms for continuous monetisation (Zhou, 2024). To this end, Zhou (2024) cited the increasing use of such monetisation mechanisms as having driven surges in revenue for the companies behind the popular games *League of Legends* and *Fortnite*, which each peaked at US$2.1 billion in 2017 and US$5.8 billion in 2021.

Conversely, there is a growing availability of online gambling activities which are positioned as games, notably 'social casino games' such as *Zynga Poker* and *High 5 Casino*. This has been accompanied by a discursive shift toward emphasising the entertainment aspect of gambling by the industry, whereby it is often publicly promoted as gaming (King et al., 2015). Increasingly, gambling activities are incorporating components traditionally associated with gaming, such as having outcomes depend on skill, or requiring interactivity and team play between players (Teichert et al., 2017).

3.2.2 Online gambling and online gaming harms

Literature about harms associated with online gambling and online gaming is limited. For research and diagnostic purposes, harm from gambling is often measured using the Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001) or the Short Gambling Harms Screen (SGHS; Browne et al., 2022). The former categorises individuals in terms of the risk of their gambling behaviour while the latter focuses solely on harms experienced from gambling behaviour. Harms include financial problems, relationship disruption, psychological distress, and a reduced ability to engage in work or school (Langham et al., 2016). The harms of online

gaming are often assessed through adapted versions of these measures; no specific, and internationally accepted indexing tools currently exist.

In one of the few studies of online gaming-related harm, Carey et al. (2022) surveyed 471 self-defined regular gamers and found a positive association between gaming and experiencing psychological harms, and between regularly buying loot boxes and experiencing financial harms. Drummond et al. (2020b) also found a significant association between loot box purchasing and psychological distress. However, mixed results have been found, with Etchells at al. (2022) and Xiao et al. (2024) not finding any association between loot box purchases and psychological distress. These discrepancies are likely to be due to methodological differences between the studies (Drummond et al., 2025).

Gaming activities which allow for continuous spending options are most likely to incur financial harm to the player. Tang et al. (2022), in their study of people who played gacha games (which include toy vending machine-style mechanics to encourage in-game expenditure) found that participants who already experienced greater stress and had higher anxiety levels were more likely to spend money on gacha purchases. They also found that this group were more likely to be involved in a larger number of gambling activities, suggesting that gacha games might allow for companies to exploit pre-existing distress. Carey et al. (2022) also noted a positive relationship between an individual spending more time gaming online, and having a high PGSI score, suggesting a relationship between engaging in both online gaming and online gambling, and incurring harms from both. Steinmetz et al. (2022) corroborated this, with their survey of 46,136 adult German internet users; they found that for individuals who participated in F2P games, the frequency of expenditure on in-game purchases was the most important predictor of online gambling in a way that could be considered disordered.

The harms incurred by online gambling itself are under-researched. Generally, studies assess the harms of gambling, rather than through this specific modality. Interpreting findings of broad gambling harms is complicated by the fact that a proportion of those gambling online also gamble at land-based venues (Marionneau et al., 2024). However, Marionneau et al. (2024) speculated that online gambling can facilitate significant harms to players, by virtue of its constant availability, speed and intensity of play, and the potential for companies to cross-advertise other forms of gambling and similar products while users are gambling.

The relative burden of online gambling and online gaming harm for different sociodemographic groups is also under-researched (Steinmetz et al., 2022). Through a web panel survey, Costes and Bonnaire (2022) found that compared to non-gamers, F2P gamers were more likely to be young, employed and wealthy. However, in one of the few reports investigating burden of financial harm from playing such games, von Meduna et al. (2019) found a strong positive relationship between low educational attainment and frequent loot box purchases. In terms of online gambling harms, individuals were most at risk if they had a low income, were unemployed, or were disengaged from their schooling (Lloyd et al., 2016). Though not specific to online gambling, Larsen et al. (2013) found that compared to other population groups, indigenous people were generally more likely to experience gambling-related harm. Nilsson et al. (2024) also found that while migrants were less likely to gamble compared to non-migrants, the former group were more likely to experience harm from this activity. Studies have suggested that variations in cultural customs have contributed to this difference. The importance of financial success to Iranian Americans, and understandings of fatality, destiny, and chance in Chinese communities have both been cited as increasing the likelihood individuals from these populations to gamble, and experience harm from it (Nilsson et al., 2024). The applicability of these results to online gambling is currently unknown.

Regardless, psychologists contend that both online gambling and online gaming expose individuals to risks of developing 'behavioural addictions' (Drummond et al., 2020b). Gambling disorder is recognised as a problematic pattern of behaviour by the American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR); a text used internationally by mental health professionals to confer diagnoses (American Psychiatric Association, 2022). According to the DSM-5-TR, a gambling disorder diagnosis involves repeated engagement in harmful gambling behaviours. An individual must meet at least four of nine criteria in a 12-month period. For example, one might gamble when feeling distressed, have made repeated unsuccessful attempts to stop gambling, frequently think about gambling when not actually gambling, and chase one's losses after losing a wager.

Though internet gaming disorder is currently described by the DSM-5-TR as a condition for further study rather than an identifiable disorder, its proposed criteria are similar to those of gambling disorder and include experiencing withdrawal when unable to game, giving up other important activities to spend time gaming, playing to relieve negative moods, feeling unable to reduce playing time, and continuing to game despite acknowledging such harms. Though the APA recognises gambling disorder separately from a potential internet gaming disorder, the usefulness of this distinction is limited, given the gradual convergence between online gambling and online gaming (King et al., 2015). As this crossover between products, platforms, and networks develops, the structural boundaries of what constitutes each are becoming less distinguishable. These overlaps, therefore, complicate taxonomies and screening, diagnoses, and regulatory frameworks to manage both (King et al., 2015). Indeed, the World Health Organisation, in its 11th Revision of the International Classification of Diseases (ICD-11) recognises both gambling disorder and gaming disorder (irrespective of the inclusion of microtransactions) as being addictive disorders with similar symptoms, epidemiology and neurobiology (World Health Organisation website, n.d.).

3.2.3 Prevalence of online gambling and online gaming

Due to the convergence of online gambling and online gaming, and the availability of several frameworks to assess engagement in each, prevalence estimates are limited and inconsistent. Some studies have measured prevalence based on the frequency of play, whereas others have considered the amount of money spent in a given period. Attempts at assessing the harms of each, and at what point patterns of engagement should be considered disordered, are equally varied. Generally, it is accepted that both activities are becoming more popular (Chóliz et al., 2021; Montiel et al., 2022).

Between January 2020 and June 2024, *Steam*, an online gaming platform for buying and downloading games, and live streaming of games and player interaction, reported an increase in monthly online players from 18.3 million to 35.2 million. At their respective peaks, F2P games *Lost Ark*, *Dota 2*, and *Goose Goose Duck* had 1.3 million, 1.3 million, and 0.7 million concurrent players, respectively (Steam, 2024). In 2022, in a representative sample of 5,062 French, self-defined online gamers, Costes and Bonnaire (2022) noted that 68.6% had played a F2P game in the previous year, and 26.1% of that group had spent money in the game. In a comparable study, 10.8% of participants reported spending money on loot boxes in the previous three months, with an average of US$16.59 spent per purchase (Carey et al., 2022). The highest recorded expenditure on a single microtransaction by a participant was US$133.20. In a scoping review of sixteen empirical studies involving people who gamed online, Montiel et al. (2022) identified a consistent (and significant) positive relationship between loot box purchases and being diagnosed with an internet gaming disorder. However, Pontes et al. (2022) cautioned that the prevalence of disordered gaming varies significantly by study, depending on

the frameworks being used. In a sample of 123,262 people who gamed from 168 countries, 4.97% met APA's proposed internet gaming disorder criteria, whereas only 1.96% of participants met the ICD 11 gaming disorder criteria.

Similarly, defining prevalence of those diagnosed with an online gambling disorder is complicated by varying diagnostic criteria (Fiskaali et al., 2023). However, a small number of studies have been published that allow comparisons between countries in terms of online gambling (not necessarily considered disordered). According to the United Kingdom (UK) Gambling Commission, in March 2020, almost one-quarter of British adults had gambled online in the previous month, compared to only one in six in 2015 (Gambling Commission, 2024). They also reported that in 2020, online gambling companies held the largest share (approximately 40%) of the gambling industry. In Spain, however, a representative sample of 6,816 adults included only 6.06% who had ever gambled online (Chóliz et al., 2021). Why this variation between countries exists has seldom been addressed in literature, though Calado et al. (2017) cited discrepancies in gambling laws between nations as a reason.

The current brief review of literature also noted that few studies consider the frequency that people gamble online. Catania and Griffiths (2022) made one of the only contributions to research in this area in their study of 982 UK-based customers of *Unibet* (an online gambling platform). They found that over three months, participants spent an average of 126 hours gambling online and, on days when they deposited money, credited £142 to their accounts, on average. However, participants were exclusively those who met the DSM-5-TR criteria for gambling disorder. Further research is required which considers the frequency of engagement of anyone who has gambled online.

3.2.4 Harm minimisation initiatives

To mitigate harms from online gambling and gaming, a limited number of initiatives have been implemented and assessed internationally. Some have targeted individual players by implementing time limits on access to games, whereas others have sought to regulate industry practices. The successes and difficulties associated with both strategies are detailed below.

Initiatives which sought to modify individuals' gambling and gaming behaviours have offered varying results. To limit online gambling time, Wohl et al. (2013) tested the efficacy of a novel, pop-up, limit reminder tool. This was informed by a persuasive systems design framework, whereby websites were developed to be simple to use and to provide information to their users, in this case, a tailored message. They found that participants receiving the message generally spent less money on online gambling compared to those receiving a more traditional pop-up reminder. Similarly, for online gaming, Kuss (2018) suggested that if players received customised warnings reminding them how much time they had played in a week, this might reduce risk of incurring harm without limiting the enjoyment of recreational gamers. However, other studies are less optimistic regarding the usefulness of measures which target individual behaviours. For example, comparing one group which received an enforced break in play with another that did not, Parke et al. (2019) did not note any statistically significant differences in online gambling persistence.

Warning labels that disclose the presence of loot boxes at time of purchase of F2P games (e.g. wording such as "includes paid random items") have not been found to be effective in informing consumers (Garrett et al., 2023). Furthermore, the information may not be present even when legally required or may use language unfamiliar to players (Xiao, 2023a). Part of the problem is that the industry is often allowed to self-regulate (Xiao, 2023a).

Initiatives which aim to educate users and alter attitudes and behaviours towards internet use may be useful (Turel et al., 2015). Though research on this topic is largely speculative, there exists a small number of cases where regulatory change has sought to target online gambling and gaming companies, rather than focusing on individuals whose gambling behaviours have been diagnosed as disordered. In gambling harm rhetoric, there is a discursive binary between 'disordered' (or 'problematic') gamblers, and gamblers who wager 'responsibly' (Livingstone & Rintoul, 2020). The former group are those who continue to gamble despite it causing harm. The latter are those perceived as capable of gambling while managing potential harms. This demarcation positions individuals as solely responsible for their gambling and any harm incurred through it. Livingstone and Rintoul (2020) articulate that this impedes regulation of gambling material and ensures that industry interests are prioritised. In the UK, Banks and Waters (2022) cited the focus of making individuals responsible for managing their own gambling harms as facilitating massive industry expansion; attention is limited to 'disordered gamblers' who represent the "casualties of legitimate gambling as a consumer choice" (p. 676).

While low income, low educational attainment, young, indigenous, and migrant groups may be particularly susceptible to online gambling (and online gaming) harms due to vulnerability and financial difficulties, the current individual responsibility framework has allowed microtransactions (e.g. through loot boxes) in F2P games, which encourage entrapment and financial harm (King & Delfabbro, 2018). To protect financially vulnerable young people, Steinmetz et al. (2022) suggested the implementation of age verification requirements for payments in F2P games. To mitigate exploitation more broadly, in 2018, the Belgian Gaming Commission attempted to make it mandatory for gaming companies to have a gambling licence before including loot boxes in their games (Xiao, 2023b). However, uneven enforcement of this measure meant that paid loot boxes remained widely available; as of 2023, Xiao (2023b) found that they were still accessible in 82% of the 100 highest-grossing iPhone games in Belgium.

The potential usefulness of an equivalent measure in New Zealand is, therefore, difficult to estimate. However, by reframing the issue in this way, future programmes can sidestep the targeting of a small number of disordered gamblers and gamers, instead taking a public health approach to support vulnerable populations who might be particularly susceptible to financial entrapment. Though research identifying the sociodemographic makeup of those participating in online gambling and F2P gaming in New Zealand is limited, the following section covers what is currently known, and what needs to be researched further, before programmes can be introduced to limit the harms of engaging in these activities.

3.3 New Zealand developments

3.3.1 Public health approach

New Zealand is one of only a few nations to regulate gambling in an explicit public health framework (Abbott, 2020). Since 2004, the Ministry of Health has been responsible for implementing a public health approach via a three-yearly strategy to prevent and minimise gambling harm. Broadly, the strategy sets priorities for nationwide public health, support and treatment services for those who gamble, as well as funding independent research (Ministry of Health, 2022). The Department of Internal Affairs is responsible for managing the gambling regulatory framework (Abbott, 2020).

The *Strategy to Prevent and Minimise Gambling Harm 2022/23 to 2024/25* (the Strategy), acknowledged the convergence between online gambling and online gaming. It cited online Instant Kiwi (an online gambling 'scratch card' that utilises game-like aural and visual cues)

and online games that incorporate loot boxes, as causes for concern (Ministry of Health, 2022). It acknowledged that the latter is not currently legally recognised as gambling in New Zealand.

There are several services supporting individuals experiencing harms from gambling and gaming behaviours. For example, the *Net Addiction* website offers brief advice and guides online gamers to professional help and support groups. Health New Zealand, as part of the Strategy, funds a range of gambling treatment services including a 24/7 helpline embedded in the national telehealth service, a national mainstream treatment service, a national Pacific treatment service, a national Asian treatment service and several regional Kaupapa Māori treatment services. However, despite growing rates of engagement in gambling-like elements and behaviours in online gaming, no government funded services provide counselling for those struggling with harms specifically related to online gaming.

3.3.2 Prevalence of online gambling and online gaming

Though accurate online gaming prevalence has not been directly determined, Brand et al. (2023) reported that in New Zealand, between 2021 and 2023, those who played any video games increased from 3.7 million to 4.1 million, with 10% of this population regularly watching Esports (competitive videogaming) online, and 17% describing online multiplayer games as their preferred genre. The Ministry of Health (2022) noted that since the COVID-19 lockdown period, online gambling has also increased. Over 1.1 million (26.7%) New Zealand adults gambled online in 2020; this was a 43% increase on the previous year.

However, how engagement rates in either activity vary between sociodemographic groups remains unknown. Equally, associated harms and how they burden different groups is under-researched. One exploratory survey by Drummond et al. (2020b) posited that compared to Australia and the United States of America, New Zealanders showed the strongest association between loot box spending and psychological distress. Despite a demonstrated need to understand who is most burdened by harms, research is limited beyond this study.

3.3.3 Legislation of offshore online gambling and online gaming

Offshore operated online gambling and online gaming activities are not currently controlled by national legislation. Under the Gambling Act 2003, F2P games are not recognised as gambling and are, therefore, not subjected to restraints on how they are advertised and implemented (Te Hiringa Hauora, 2019). Similarly, overseas lotteries, gaming machine websites and applications, and casino websites and applications are not regulated by law (Safer Gambling Aotearoa, 2024). Lotto New Zealand and the New Zealand TAB (betting organisation) are the only providers of online gambling that are monitored and controlled. However, the Government has announced that overseas online casino gambling regulations will be introduced in 2026. Programmes to support people experiencing online gaming harms are limited, but equally, there remains a need for legislation which recognises aspects of F2P games (and simulated gambling) as potentially problematic, to limit the exploitation of vulnerable populations.

Given what has been reported in international literature, it seems logical that legislation should be informed by data on the sociodemographic burden of online gambling and online gaming harms. Māori, Pacific and Asian people have a higher risk of incurring gambling harms compared to other populations; however, the extent to which this applies to harm through F2P gaming is currently unknown (Te Hiringa Hauora, 2019).

3.4 Summary

This review first described the convergence of online gambling and online gaming. Difficulties in estimating harms caused by these hybridised activities and the populations most affected were then described. It was shown that vulnerable groups may be financially entrapped by these activities, and that the development of meaningful legislation to protect these groups has been limited by the burden of responsibility being placed on 'disordered' gamblers and gamers. The prevalence of engagement, and the current regulatory landscape of New Zealand was then described. Research on the sociodemographic patterns of monetary engagement in these activities was identified as lacking. Given what was noted internationally, this must be addressed to inform the development of harm reduction and public health policies which support and protect vulnerable populations in New Zealand.

This review found:

- Online gambling and online gaming activities are merging, creating hybrid activities that blur traditional boundaries.
- Like traditional gambling, these activities can expose players to financial harms.
- Internationally, vulnerable groups such as young people, those with lower incomes, and indigenous and migrant populations have a higher risk of harm (compared to the general population) from these hybrid activities.
- In New Zealand, there is limited understanding of how different sociodemographic groups are affected.
- Effective harm reduction strategies require targeted research to address these gaps in knowledge.

4 RESEARCH METHODS

4.1 Ethical approval

Ethical approval was granted by the Auckland University of Technology Ethics Committee on 19 July 2024 (Reference 24/195).

Each participant was given a unique identification code to ensure anonymity. No personal identifying information is reported. Participation was voluntary with participants opting into the online survey. They could choose to not respond to individual questions or to withdraw from the survey at any time by closing the browser.

4.2 Research oversight

4.2.1 Advisory Group

A study Advisory Group was established to guide the progress of the research. The Group was guided by a formal Terms of Reference document drafted by the research team and refined by the Group. They met with the research team on four occasions during the study:

1. At the start of the research process to understand the purpose and to provide initial advice.
2. After completion of the draft literature review and survey data collection, to discuss and advise on both the review and preliminary survey findings.
3. At the draft report stage to discuss and advise on key points to be highlighted in the report.
4. After completion of the draft report to advise on creation of an appropriate resource to disseminate research findings to relevant communities and stakeholder groups.

The Advisory Group comprised six members, with the following demographics:

- Gender: Three male and three female.
- Ethnicity: Three Māori, one Pacific, one Asian, and one Pākehā.
- Situation: One gambling treatment provider, one non-profit digital technology education provider, one academic, and three people with lived experience of gambling and/or gaming harm.

4.2.2 International advisors

Two Canadian academics, Professor Sylvia Kairouz (Concordia University) and Associate Professor Annie-Claude Savard (Laval University) were advisors to the research as they are both active members of the E-GAMES International Research Network. Prof. Kairouz was one of the three founding members of the Network, which was developed to understand online gambling and F2P gaming in six Western countries using the same methodology and set of questions to allow international comparisons to be made. Both international advisors were significantly involved in the design of the online survey for the current research, so that findings from New Zealand can be, in the future, compared with other international surveys on this subject. They also provided advice on data interpretation and critical commentary on the final research report.

4.3 Hypothesis and aims

The research **hypothesis** was that the prevalence of adults who participate in F2P games and who make microtransactions will be lower than the prevalence of online gamblers. A secondary hypothesis was that there would be a minority of adults who gamble online and make microtransactions in F2P games.

The **aims** of the research were to understand:

1. Sociodemographic and behavioural characteristics in monetary engagement in F2P gaming and online gambling (i.e. frequency of engagement, expenditure, and influencing factors).
2. How engagement relates to F2P gaming and gambling risk and harm.

4.4 Research design

A sample of adult internet users who pay money to engage in F2P gaming and/or online gambling was purposively recruited[2] to complete a short 10-minute online survey. Recruitment was undertaken by New Zealand based online panel provider, Horizon Research.

4.4.1 Data collection

Horizon Research used five population representative online research panels including their Māori panel to recruit the participants; this ensured an oversampling of Māori participants to allow a sufficient sample for Māori subgroup analyses. An invitation to take part in the research was emailed to all panel members (Appendix 1). Before potential participants could proceed, they were required to read a study information sheet and tick a box to indicate consent. Recruitment was undertaken from 13th to 30th August 2024, with a final sample size of 4,180 respondents[3]. Inclusion criteria were being aged 18 years or older, currently living in New Zealand, and an online gambler and/or a F2P gamer who spent money on microtransactions. All participants who completed the survey were entered into a quarterly prize draw for $1,000 cash and an iPad Pro valued at $1,199 (or a total of $2,199 cash). These prizes were not related to this survey with the respondents being entered into the draw for every Horizon survey completed.

1. Online gamblers: Defined as spending real money on online gambling. This included lottery and scratch cards, sports and track betting, poker or other card games, casino games and electronic gaming machines.
2. F2P gamers: Defined as participation in F2P games on a website, app, computer, game console, mobile device, tablet, or social media, and made monetary payments during games to gain an item, obtain privileges, advance to a higher level, increase chances of winning or make faster progress in the game (e.g. via buying loot boxes or other microtransactions).

4.4.2 Survey instrument

The full survey questionnaire is available in Appendix 2. The questions started with Horizon Research's standard demographic questions about age, gender, ethnicity, area of residence, employment status, annual personal income, and highest educational qualification.

[2] This aligns with the E-GAMES International Research Network survey methodology to allow future data comparison between countries.

[3] The survey was started by 5,828 participants with 1,648 excluded for the following reasons: screening questions not completed; not an online gambler or a F2P gamer who spent money on microtransactions.

This was followed by two screening questions to ensure only the population of interest (i.e. those who met the inclusion criteria) would receive the survey for completion. Eligible panel members then received the survey[4], which comprised 33 questions on the following topics:

- Online gambling and F2P gaming engagement (i.e. time, money, frequency on online and land-based gambling; time, frequency on 'free' [i.e. no money spent] online 'gambling' activities; time, money, frequency in F2P gaming, access to digital devices [e.g. owned, shared, community such as at a public library]).
- Online gambling and F2P gaming motivations and inducements (i.e. awareness/ influence of advertising/marketing; impact of inducements; relationship between 'free' and monetary gambling; relationship between F2P gaming and 'free' gambling; relationship between F2P gaming and monetary gambling).
- Online gambling and F2P gaming risk level: Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001), adapted PGSI for F2P gaming (PGSI-F2P)[5]; and harm (Short Gambling Harm Screen; SGHS; Browne et al., 2018), adapted SGHS for F2P gaming (SGHS-F2P)[6].

4.5 Data analysis

Data were analysed using SPSS version 29 and SAS 9.4. A p-value of 0.05 was used to determine statistical significance. Descriptive statistics were computed including frequencies, percentages, and 95% confidence intervals (CI), where appropriate, to present an overview of the data. These statistics describe respondent demographics and engagement in online gambling, F2P gaming, or both.

To illustrate gambling and F2P gaming behaviours, graphical representations were used to describe:

- Gambling activities.
- The ratio of online to land-based gambling.
- Frequency of online gambling and F2P gaming.
- Expenditure on online gambling and F2P gaming.
- Reasons for making microtransactions during F2P gaming.
- Methods of accessing online gambling and F2P gaming.
- Negative consequences associated with online gambling, and how these differed across gamblers, F2P gamers, and individuals engaged in both activities.

[4] The survey questions closely matched the survey used in other E-GAMES International Research Network surveys (developed and validated to measure F2P gaming practices and related problems) but shortened and tailored for the New Zealand context.

[5] This adaptation has been used in previous E-GAMES International Research Network surveys, called PGSI-P2W in those studies.

[6] This adaptation was developed specifically for this study but mimicked the way the PGSI was adapted to the PGSI-F2P.

To examine relationships between online gambling and F2P gaming behaviours (including frequency of engagement, expenditure, and engagement groups [i.e. online gambler, F2P gamer, or mixed gambler-F2P gamer]) and risk level and harm, a series of logistic regression analyses were conducted. For these analyses, PGSI and PGSI-F2P, and SGHS and SGHS-F2P scores were dichotomised[7] as:

1. Non-problem/low-risk gambling or F2P gaming (PGSI/PGSI-F2P score = 0-3) vs. moderate risk/problem gambling or F2P gaming (score = 4-27).
2. Presence of gambling/F2P gaming-related harm (SGHS/SGHS-F2P score ≥1) vs. no harm (score = 0).

Logistic regression results are reported as odds ratios and relative risk ratios. Logistic regression naturally produces odds ratios. When groups are compared, odds ratios compare the odds of an outcome (i.e. how much the odds differ). Odds ratios are often misinterpreted as increased or decreased likelihood of an outcome in one group compared to a reference group. Therefore, relative risk ratios have also been reported because they describe differences between groups in terms of how much more (or less) likely one group is to experience an outcome compared to another (i.e. compares the probability or chances of an outcome in one group compared to another). Interpreting relative risk ratios reduces the chance of over-inflating the size of effects, since odds ratios can appear larger when the outcome is common. By presenting both measures, the findings are robust.

To explore online gambling and F2P gaming behaviours of Māori respondents and the relationship to gambling and F2P gaming risk and harm, the previously mentioned analyses were conducted separately for this subgroup. This analysis aimed to provide insights into potential disparities and culturally specific patterns in online gambling and F2P gaming behaviour in the Māori population. To examine differences in gambling behaviour between Māori and non-Māori participants, non-parametric Mann-Whitney U tests as outcomes were measured on an ordinal scale and normality or equal variances are not assumed.

A cluster analysis was conducted to identify behavioural and sociodemographic patterns amongst participants engaged in online gambling and F2P gaming. A two-step cluster analysis was conducted with the number of clusters determined automatically. Models were compared with up to 15 clusters using the Bayesian Information Criterion (BIC). The procedure was based on maximum-likelihood estimation and automatically retained the model with the best statistical fit.

Additionally, multinomial logistic regression was used to assess the relationship between demographic factors (i.e. age, ethnicity and gender) and engagement groups (i.e. online gambler, F2P gamer, or mixed gambler-F2P gamer).

[7] Dichotomisation of PGSI and SGHS scores was based on validated cut-scores (Ferris & Wynne, 2001; Browne et al., 2018). Dichotomisation of PGSI-F2P used the same cut-scores as the PGSI (Steinmetz et al., 2022). To be in line with this, dichotomisation of SGHS-F2P was maintained the same as for the SGHS.

5 RESULTS

5.1 Participants

Of the 4,180 survey respondents, 66.3% gambled online ('online gambler') but did not participate in F2P gaming, 5.3% took part in F2P gaming with microtransactions ('F2P gamer') but did not gamble, and 28.4% participated in both activities ('mixed gambler-F2P gamer') (Table 1).

Table 1: Percentage of participants who gambled online and/or were F2P gamers

Engagement groups	Count	%	95% CI
Online gambler[8]	2,770	66.3	64.9, 67.8
F2P gamer	223	5.3	4.6, 6.0
Mixed gambler-F2P gamer	1,187	28.4	27.1, 29.8
Total	*4,180*	*100*	

95% CI = 95% Confidence Interval

Demographic differences between the three groups are detailed in Appendix 3.

A higher percentage of males were online gamblers (55.5%) compared with females (44.4%), with a similar finding noted for the mixed gambler-F2P gamer group. This finding was reversed for F2P gamers with slightly more females (53.4%) than males (44.4%). Overall, for all groups, 44.7% of participants were aged 35 to 54 years; however, 28.2% of F2P players and 29.5% of mixed gambler-F2P gamers were aged 18 to 34 years, whilst 47.2% of online gambler participants were aged 55 years and older. Overall, for all groups, 72.8% of participants were in paid employment with an annual personal income greater than $20,000 and had some level of educational attainment. (Appendix 3, Table A).

Substantially higher proportions of Māori, Pacific and Asian participants were either online gamblers or mixed gambler-F2P gamers compared with F2P gamers. However, European/Other participants were more likely to be online gamblers than mixed gambler-F2P gamers or F2P gamers (Appendix 3, Table B).

5.2 Gambling participation

Most online gamblers bought Lotto tickets in the prior year (92.1%), with a slightly lower percentage of mixed gambler-F2P gamers (87.7%) purchasing lotto tickets. Online Lotto was the sole gambling activity for 48.2% of online gamblers and 27.9% of mixed gambler-F2P gamers. For all other gambling activities, a higher percentage of mixed gambler-F2P gamers participated in the activity than online gamblers (Figure 1).

A similar pattern was noted when participants were asked about virtual (play) money online gambling except for Instant Kiwi and track betting, where a lower percentage of participants in the mixed gambler-F2P gamer group participated compared with the online gambler group (Figure 2). Virtual money was not used for Lotto.

[8] Includes 644 respondents who also participated in online gaming but did not make any micro-transactions, i.e. they were not F2P gamers.

Participation in land-based gambling activities also showed a similar pattern with Lotto participation from a store being the only activity participated in by slightly more online gamblers than mixed gambler-F2P gamers (Figure 3).

Figure 1: Past year participation in online gambling activities for money

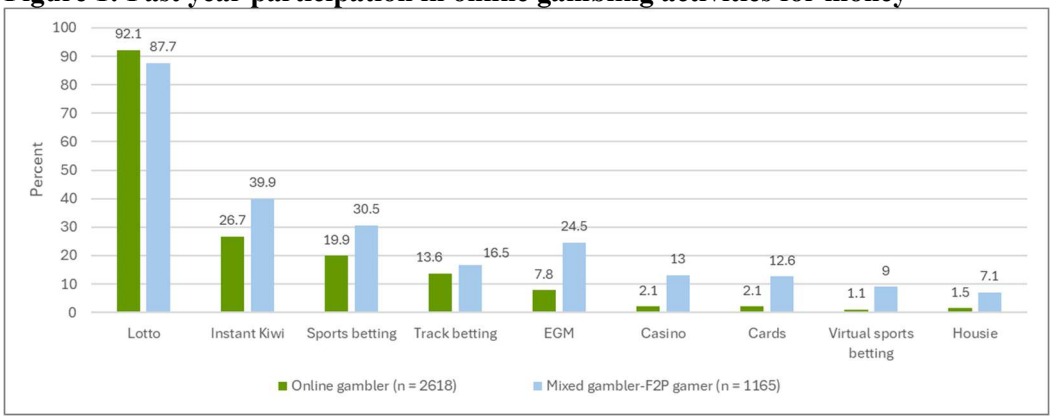


Figure 2: Past year participation in online gambling activities for virtual (play) money

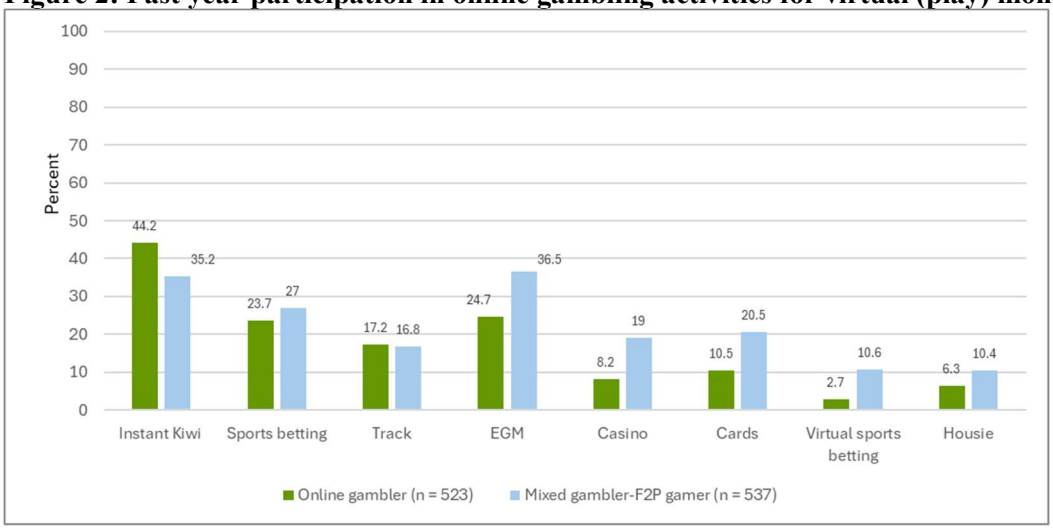
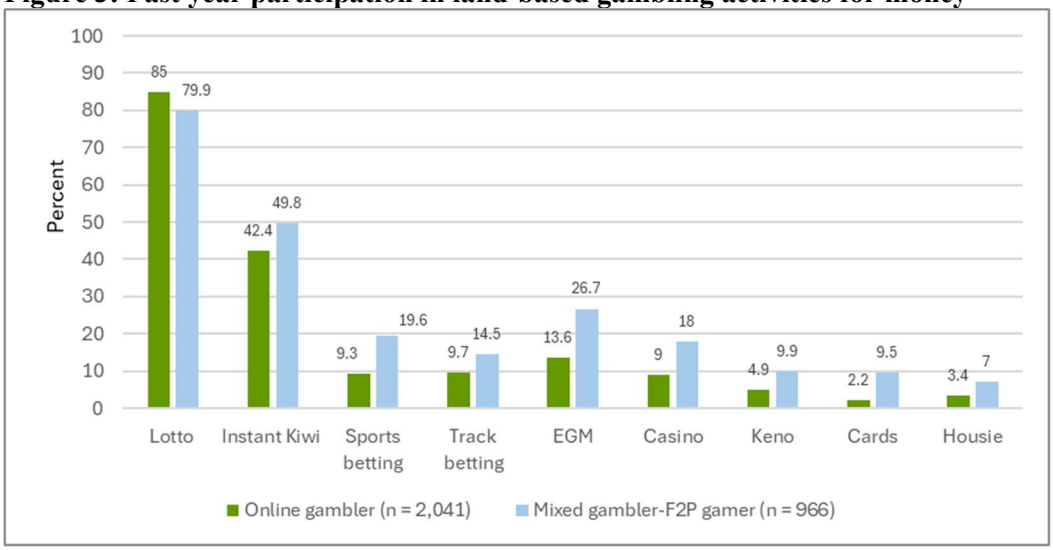
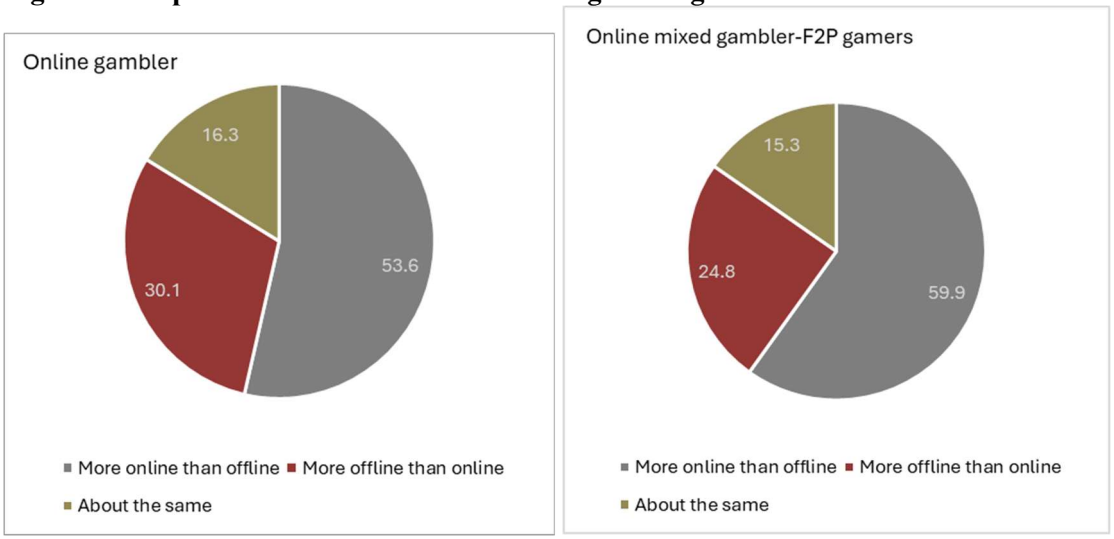


Figure 3: Past year participation in land-based gambling activities for money



A majority of online gamblers (53.6%) and mixed gambler-F2P gamers (59.9%) gambled more online than in land-based (offline) venues (Figure 4).

Figure 4: Proportion of online and land-based gambling



n = 2,036 n = 965

Table 2 shows that 55.9% of online gamblers only gambled online on one activity, with 38.9% gambling on two or three activities, and the remainder gambling on four to seven activities. Mixed gambler-F2P gamer participants showed a different profile with 34.4% gambling on one activity, 45.8% gambling on two or three activities with the remainder gambling on four to nine activities. Most online gamblers and mixed gambler-F2P gamers did not participate online for virtual (play) money. Of those who did, most participated virtually on one or two activities.

Table 2: Number of activities participated in during past year

No. of gambling activities	For money				For virtual money			
	Online gambler		Mixed gambler-F2P gamer		Online gambler		Mixed gambler-F2P gamer	
	n	%	n	%	n	%	n	%
0	0	-	0	-	2,247	81.1	650	54.8
1	1,464	55.9	401	34.4	385	13.9	308	25.9
2	739	28.2	340	29.2	101	3.6	142	12.0
3	281	10.7	193	16.6	25	0.9	44	3.7
4	97	3.7	111	9.5	7	0.3	17	1.4
5	30	1.1	70	6.0	3	0.1	14	1.2
6	6	0.2	20	1.7	1	0	6	0.5
7	1	0	14	1.2	0	-	1	0.1
8	0	-	10	0.9	1	0	5	0.4
9	0	-	6	0.5	0	-	0	-
Total	*2,618*	*100*	*1,165*	*100*	*2,770*	*100*	*1,187*	*100*
Missing	152		22		0		0	

5.2.1 Māori specific findings

An independent samples t-test indicated that Māori respondents engaged in significantly more online gambling activities for money (M = 2.21, SD = 1.41) than non-Māori respondents (M = 1.82, SD = 1.13), $p < 0.001$, Cohen's d = -0.33).

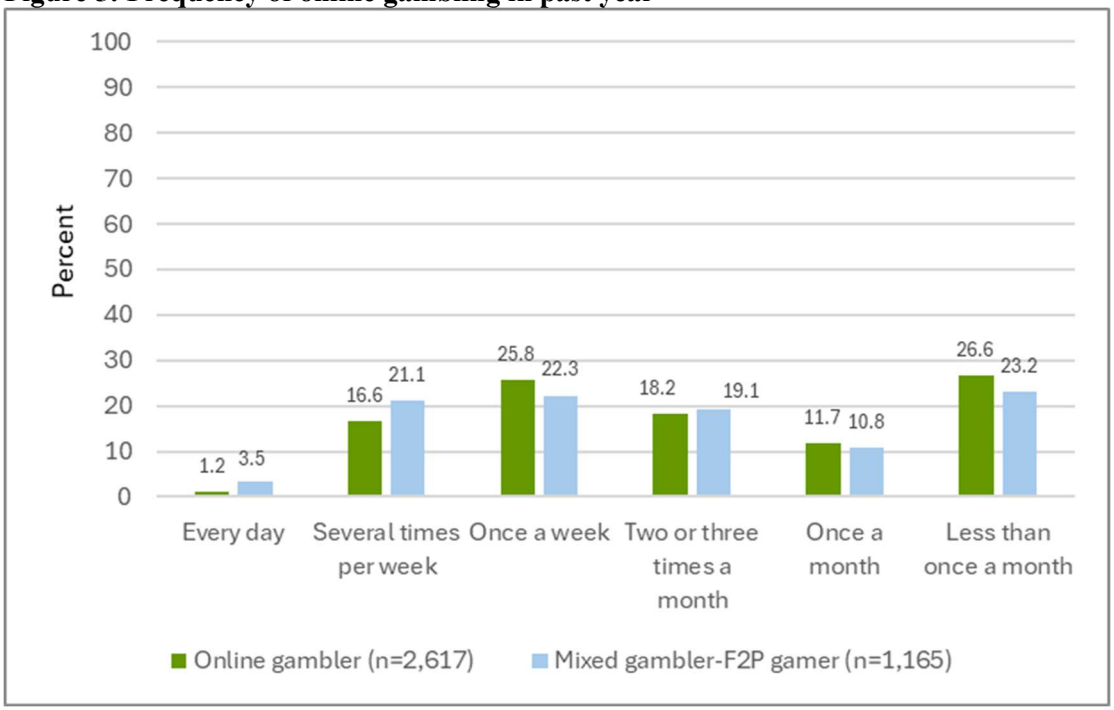
A chi-square test found a significant association between Ethnicity (Māori vs. non-Māori) and online gambling for virtual money (no engagement vs. engaging in 1+ virtual gambling activity), $\chi^2(1) = 63.52$, $p < 0.001$. Māori respondents had 1.96 times increased odds for engaging in online gambling activities for virtual money than non-Māori respondents.

5.3 Online gambling and F2P gaming: Frequency and time

5.3.1 Frequency of online gambling

Online gamblers and mixed gambler-F2P gamers were similar in the frequency of their gambling behaviour. It is of note that percentages of regular gamblers (gambling once a week or more often) were relatively high at 43.6% for online gamblers and 46.9% for mixed gambler-F2P gamers. However, only 1.2% of online gamblers and 3.5% of mixed gambler-F2P gamers gambled every day (Figure 5).

Figure 5: Frequency of online gambling in past year

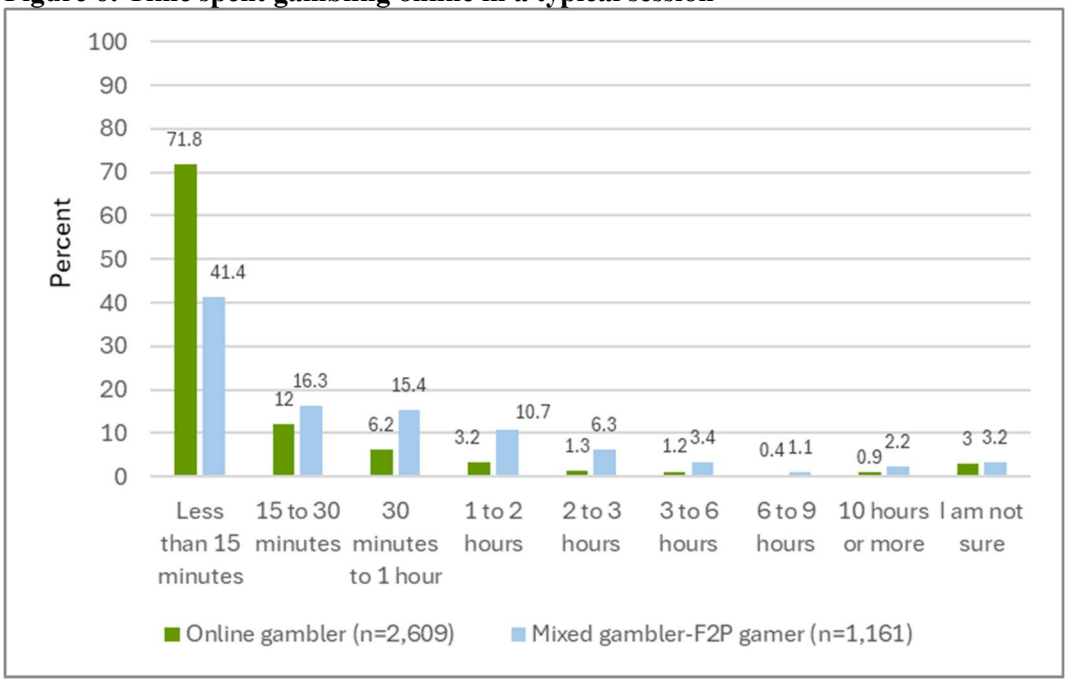


5.3.2 Time spent gambling online

The largest proportions of online gamblers and mixed gambler-F2P gamers gambled online for fewer than 15 minutes per session, though gambling session lengths could be up to 10 hours or more (less than three percent of each group). Overall, 90% of online gamblers had gambling sessions lasting up to one hour, compared with 73.1% of mixed gambler-F2P gamers. A further

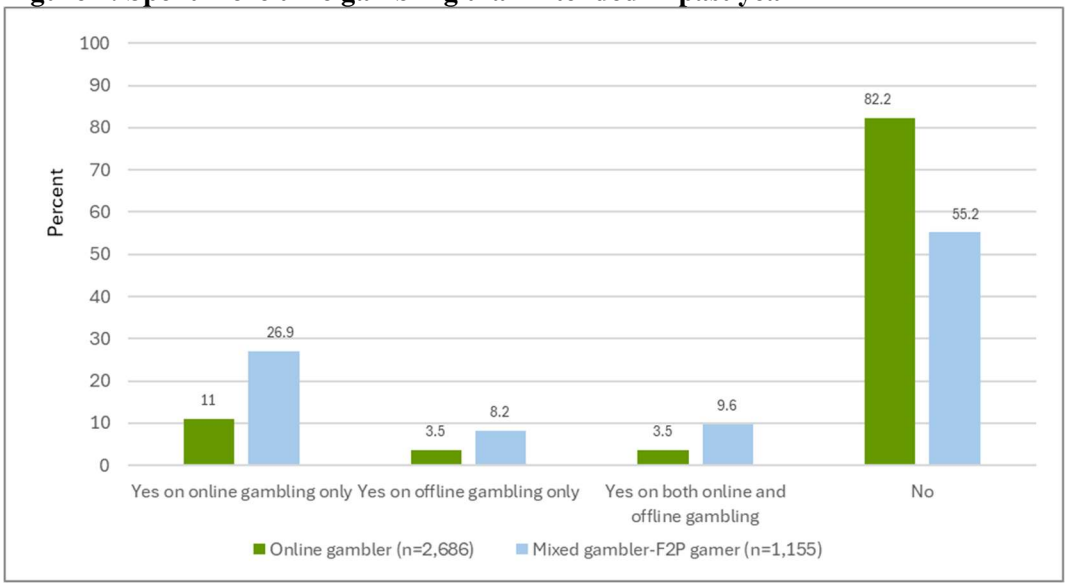
20.4% of mixed gambler-F2P gamers had gambling sessions of between one and six hours (Figure 6).

Figure 6: Time spent gambling online in a typical session



Participants were asked if they had spent more time gambling (online and land-based) than they had intended to in the last 12 months. Most respondents had not, with a higher proportion of online gamblers (82.2%) reporting they had not gambled too much compared with mixed gambler-F2P gamers (55.2%). Conversely, of participants who reported spending too much time gambling, a higher proportion of mixed gambler-F2P gamers did this compared with online gamblers. This was particularly noticeable for online gambling for which 26.9% of mixed gambler-F2P gamers had spent too much time, compared with 11% of online gamblers (Figure 7).

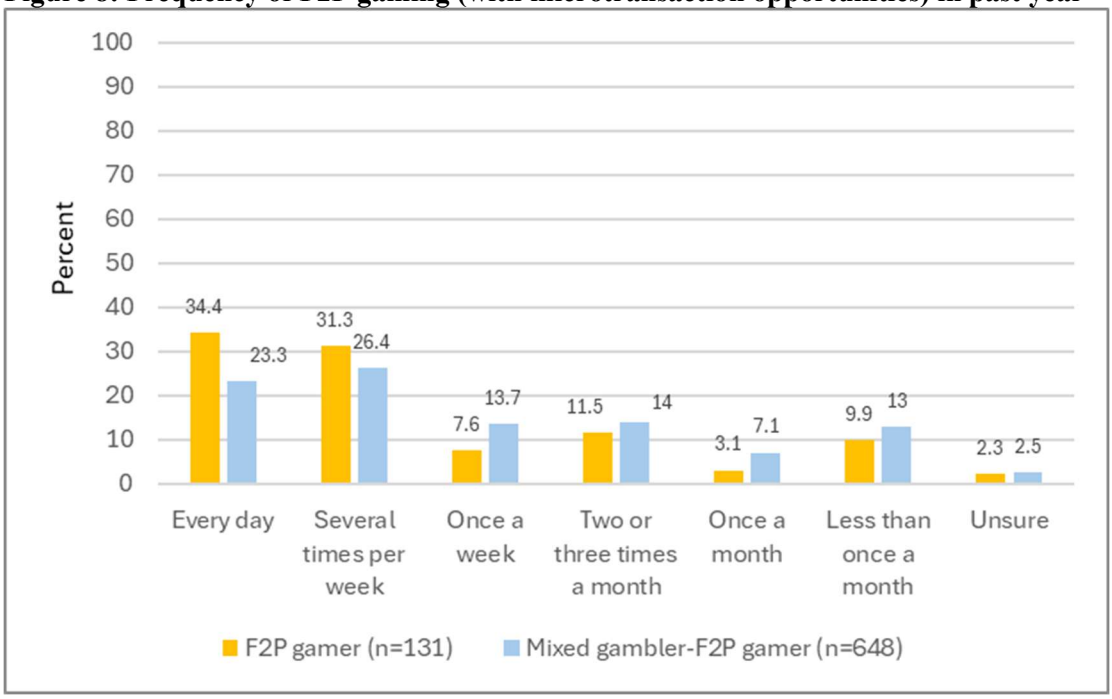
Figure 7: Spent more time gambling than intended in past year



5.3.3 Frequency of F2P gaming

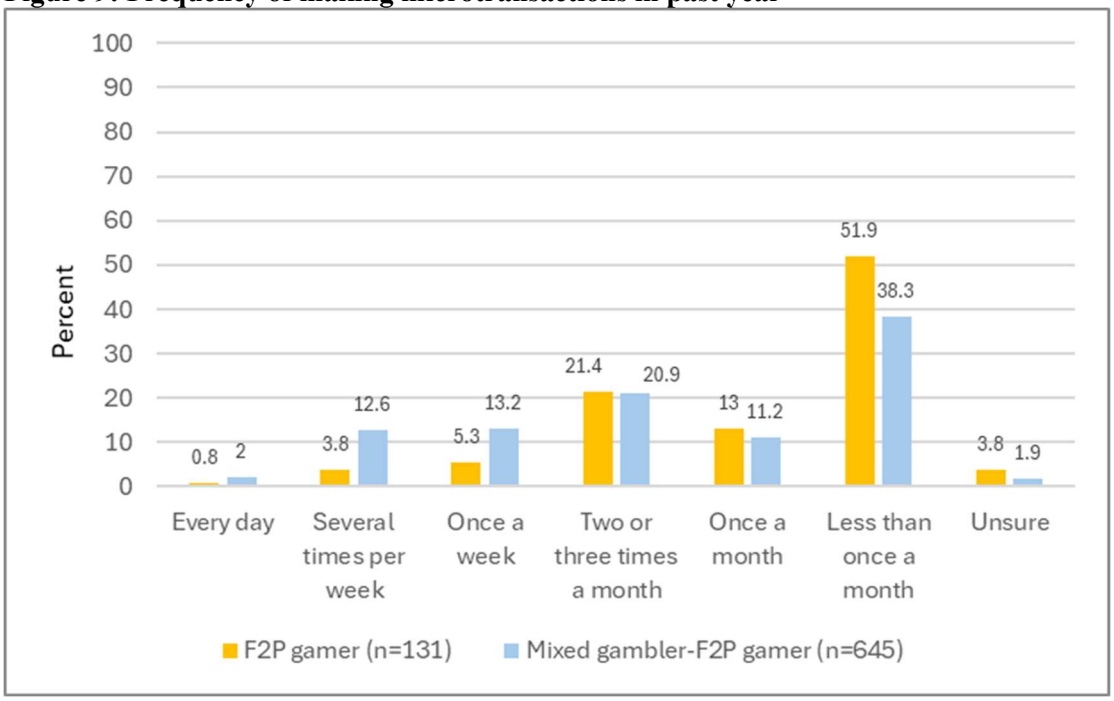
A higher proportion of F2P gamers participated in F2P gaming (with microtransaction opportunities) every day or several times a week compared with participants who were mixed gambler-F2P gamers. Conversely, higher proportions of mixed gambler-F2P gamers participated in less frequent F2P gaming (once a week or less often) compared with F2P gamers (Figure 8).

Figure 8: Frequency of F2P gaming (with microtransaction opportunities) in past year



When asked about spending money on microtransactions in the past year, a different profile was apparent. Less than one percent of F2P gamers and two percent of mixed gambler-F2P gamers spent money on microtransactions every day, with the highest proportions in both groups doing so less than once a month; greater for F2P gamers (51.9%) than mixed gambler-F2P gamers (38.3%). Conversely, a higher proportion of mixed gambler-F2P gamers spent money on microtransactions once a week or more often compared with F2P gamers (Figure 9).

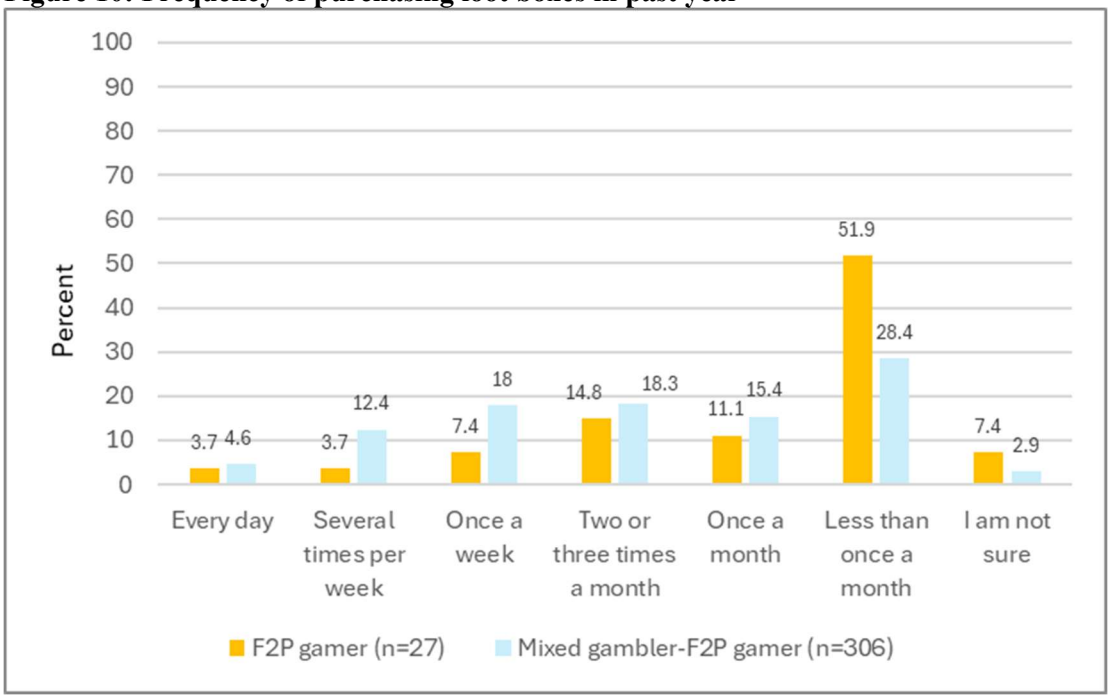
Figure 9: Frequency of making microtransactions in past year



The proportion of participants who spent money on loot boxes in the past year was relatively low for F2P gamers; 20.6% (n = 27) of the 131 respondents who competed the question on spending money on microtransactions. Loot box participation was higher among mixed gambler-F2P gamers; 47.4% (n = 306) of the 645 who competed the question on spending money on microtransactions.

The largest proportions of F2P gamers and mixed gambler-F2P gamers spent money on loot boxes less than once a month, with a higher percentage of F2P gamers (51.9%) compared with mixed gambler-F2P gamers (28.4%). Of participants who purchased loot boxes more frequently, a higher proportion of mixed gambler-F2P gamers did so in each frequency category compared with F2P gamers (Figure 10).

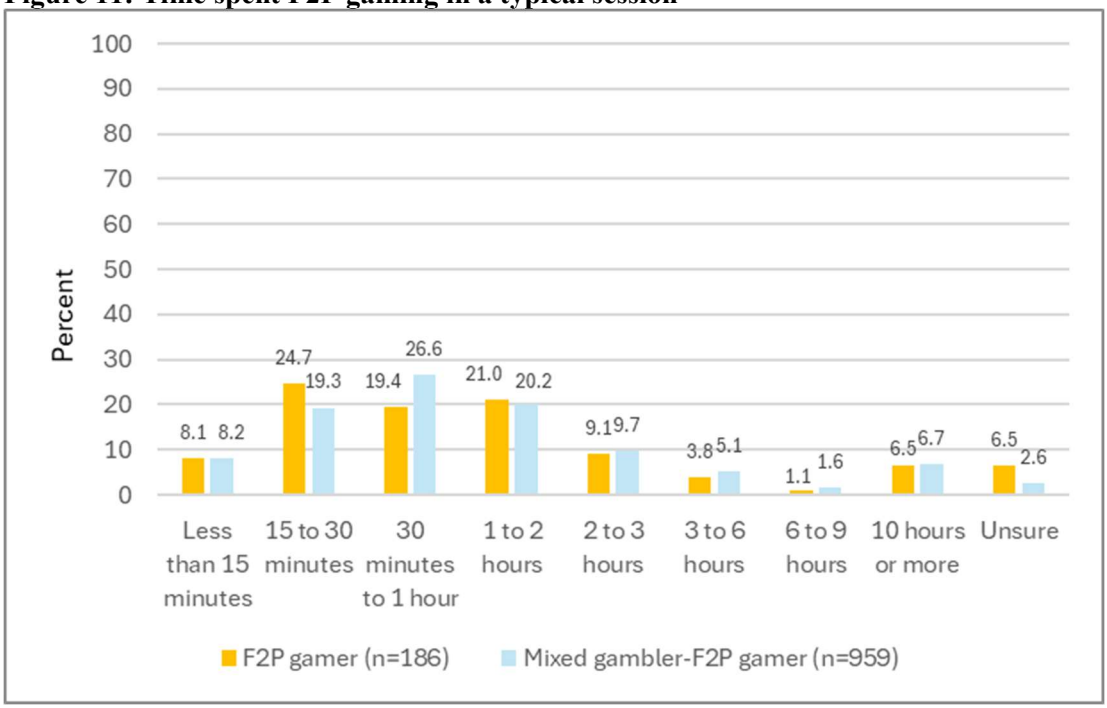
Figure 10: Frequency of purchasing loot boxes in past year



5.3.4 Time spent F2P gaming online

Most participants took part in F2P gaming for between 15 minutes and two hours per session, with less than 10% playing for less than 15 minutes per session or for 10 hours or more. Length of time spent F2P gaming was relatively similar between F2P gamers and mixed gamer-F2P gamblers (Figure 11).

Figure 11: Time spent F2P gaming in a typical session



5.3.5 Māori specific findings

There was a significant difference between Māori and non-Māori respondents on the frequency of engaging in online gambling for real money (990162.0, z-score = -2.99, p = 0.003) per year. Māori respondents had a higher mean rank (2022.7) compared to non-Māori respondents and, therefore, had a significantly higher frequency of engaging in online gambling for real money.

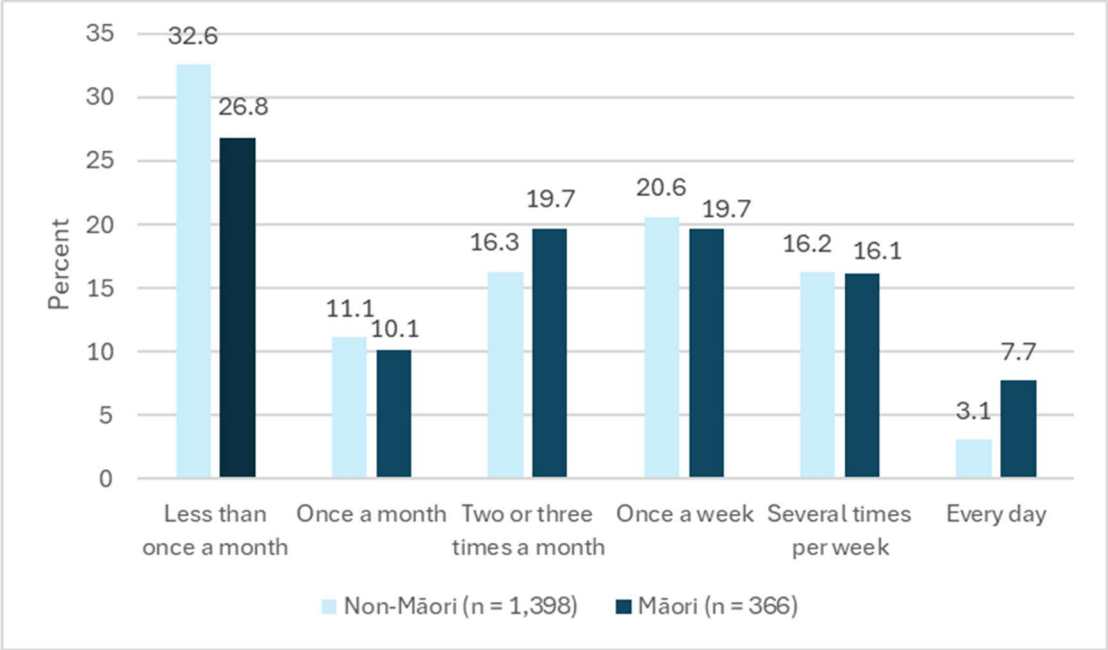
There was a significant difference in how long respondents spent gambling online for real money in one session (731703.5, z-score = -12.17, p < 0.001). Māori respondents spent a longer time on online gambling activities for real money (Mean rank = 2237.03) compared to non-Māori respondents (Mean rank = 1759.09).

A Mann-Whitney test found a significant difference in the distribution of frequency of engaging in online gambling for virtual money per year between Māori and non-Māori respondents, with Māori more likely to participate more frequently, U = 343938.0, z-score = 2.48, p = 0.001 (Figure 12). There was also a significant difference in how long respondents spent gambling online for virtual money in one session (U = 157323.5, z-score = -9.44, p = 0.001). Māori respondents spent a significantly longer time on online gambling for virtual money in one session (Mean rank = 1034.8) compared to non-Māori respondents (Mean rank = 778.05).

There was a significant difference in how long respondents spent F2P gaming in one session (U = 201843.0, z-score = -4.44, p < 0.001). Māori respondents spent a significantly longer time on F2P gaming (Mean rank = 935.8) compared to non-Māori respondents (Mean rank = 811.1).

However, there was no significant difference between Māori and non-Māori respondents on the frequency of engaging in F2P gaming and spending money on microtransactions (p = 0.52), or the frequency of purchasing loot boxes (p = 0.08).

Figure 12: Frequency of online gambling for virtual money: Māori and non-Māori

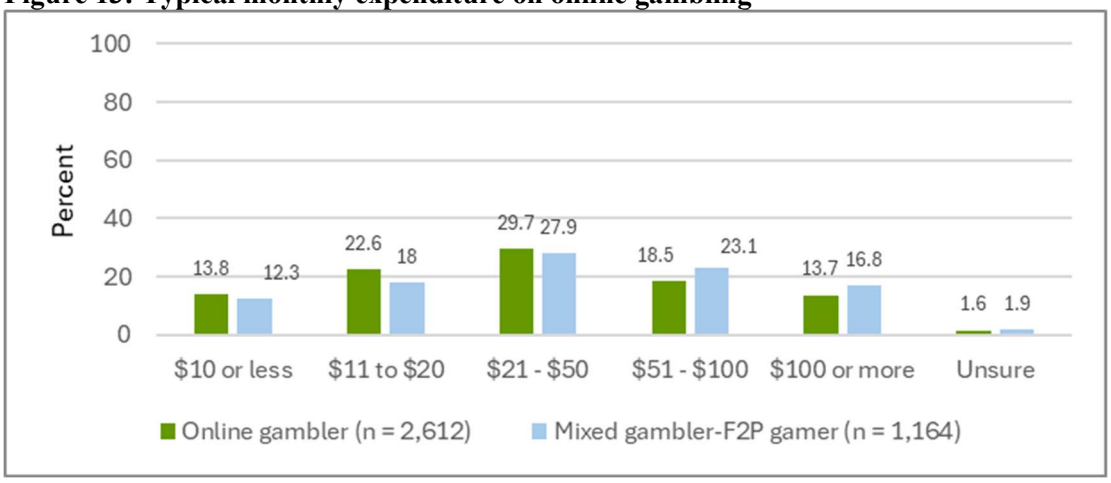


5.4 Online gambling and F2P gaming: Expenditure

5.4.1 Monthly expenditure on online gambling

Typical monthly expenditure on online gambling was similar between online gamblers and mixed gambler-F2P gamers. The range was from $10 or less up to $100 or more, with the largest proportions of both groups spending in the range of $21 to $50 (Figure 13).

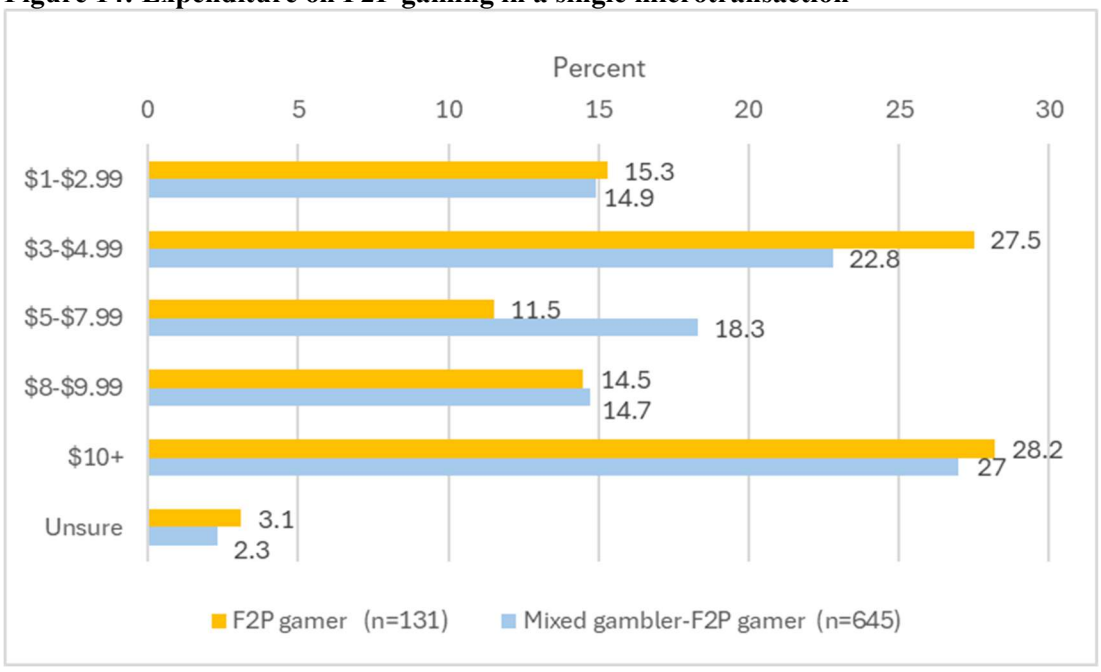
Figure 13: Typical monthly expenditure on online gambling



5.4.2 Expenditure on F2P gaming in a single microtransaction

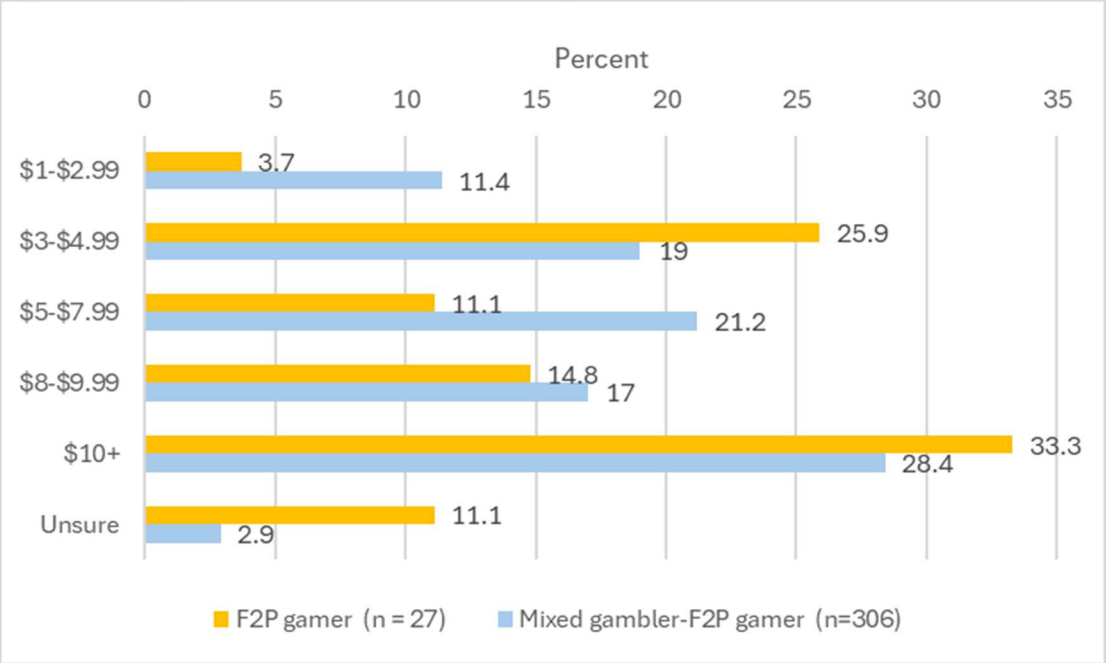
When asked about typical expenditure in a single microtransaction, amounts ranged from $1-$2.99 to $10 or more. Transactions were made in each monetary range with the most common being $3-$4.99 and $10 or more (Figure 14).

Figure 14: Expenditure on F2P gaming in a single microtransaction



When specifically asked about loot box purchases, one-third (33.3%) of F2P gamers who bought loot boxes spent $10 or more per transaction. The next most common amount to spend on loot boxes in a single transaction was $3-$4.99 and the least common was in the $1-$2.99 range. This profile of F2P gamers differed from loot box expenditure of mixed gambler-F2P gamers who, while most commonly spending $10 or more (28.4%), were more likely to have an even spread of expenditure in the other monetary ranges (Figure 15). However, the sample size of F2P gamers who spent money on loot boxes was small (n = 27), so the results should be treated with caution.

Figure 15: Expenditure on loot boxes in a single transaction



5.4.3 Māori specific findings

A Mann-Whitney test found a significant difference in monthly expenditure on online gambling between Māori and non-Māori respondents (U = 1358524, z-score = 5.14, p = 0.001). A higher proportion of Māori spent greater amounts each month on online gambling than non-Māori specifically in the $51-$100 and $101 or more ranges (Figure 16).

A higher proportion of Māori, compared with non-Māori spent $10 or more in a typical single F2P gaming transaction on both microtransactions (U = 20564.0, z-score = 2.60, p = 0.001) (Figure 17) and purchasing loot boxes (U = 85078.5, z-score = 2.24, p = 0.02) (Figure 18).

Figure 16: Typical monthly online gambling expenditure: Māori and non-Māori

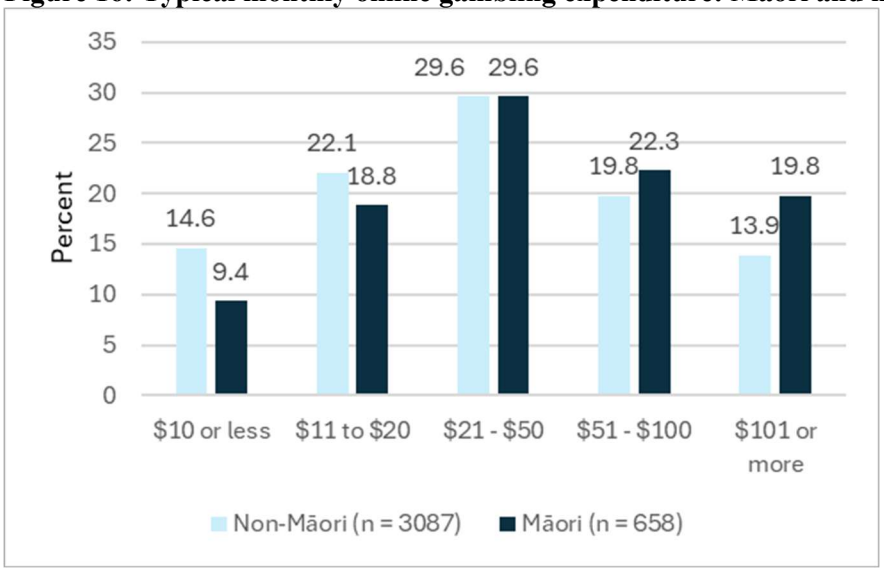


Figure 17: Microtransaction expenditure in a single transaction: Māori and non-Māori

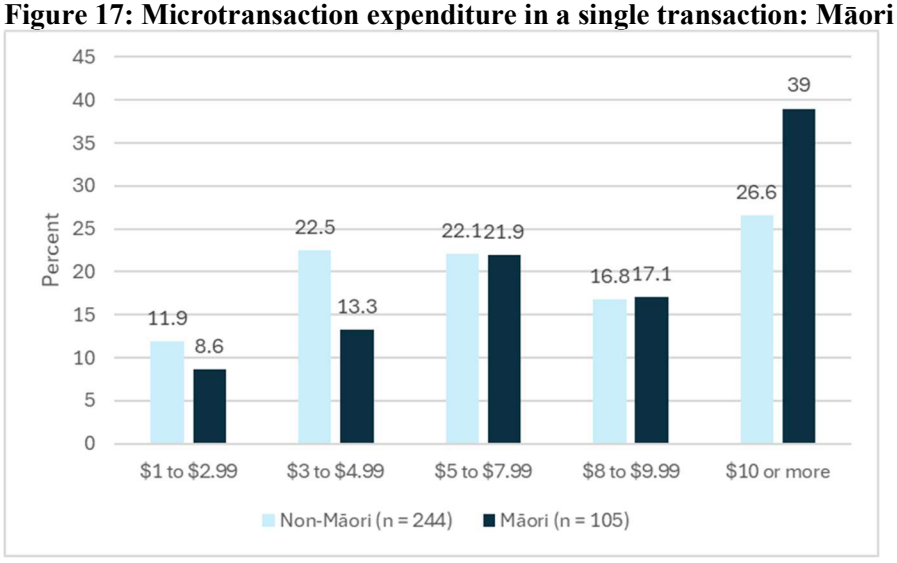
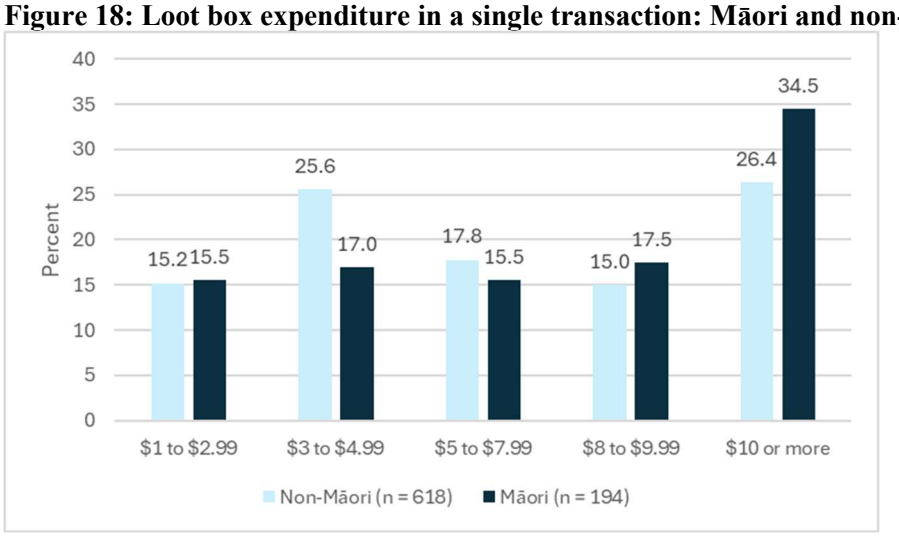


Figure 18: Loot box expenditure in a single transaction: Māori and non-Māori



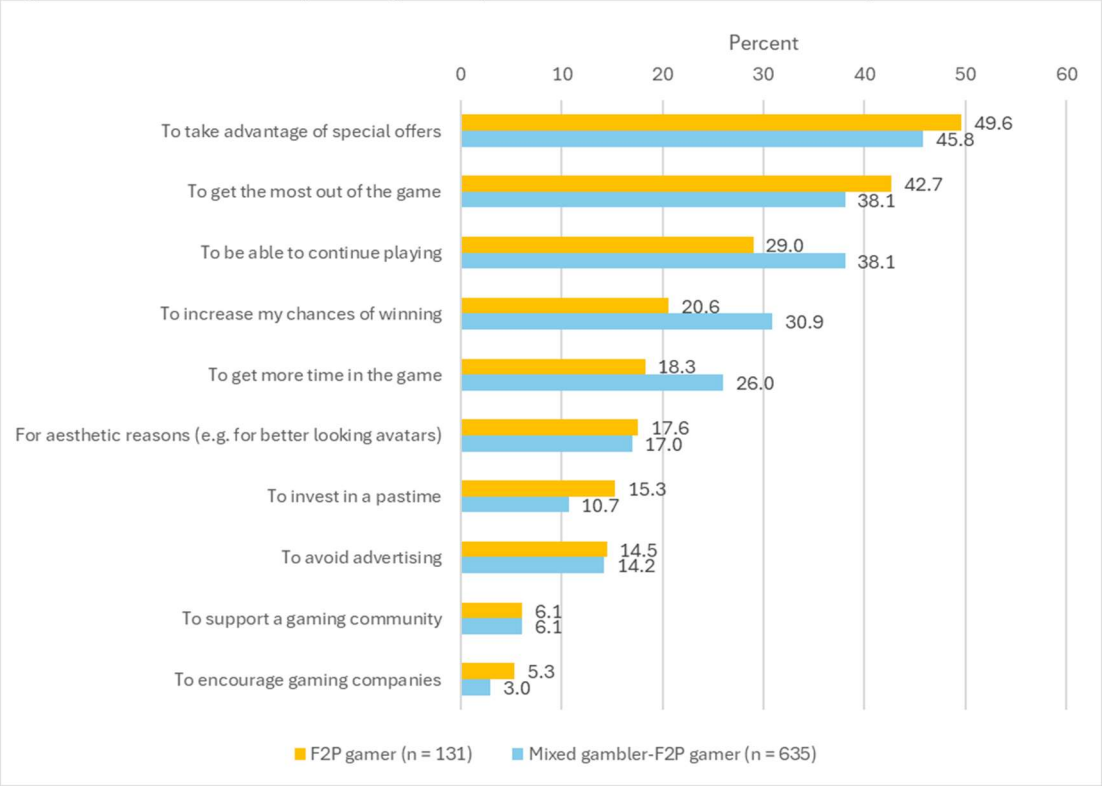
5.4.4 Reasons for spending money on microtransactions

Figure 19 shows that the five most common reasons for spending money on microtransactions in F2P games were to:

1. Take advantage of special offers
2. Get the most out of the game
3. Be able to continue playing
4. Increase chances of winning
5. Get more time in the game.

The first two reasons were reported by 92.3% of F2P gamers compared with 83.9% of mixed gambler-F2P gamers, whilst the next three reasons were mentioned by 67.9% of F2P gamers compared with 95% of mixed gambler-F2P gamers. Similar percentages of both groups made microtransactions for aesthetic reasons (about 17%) and to avoid advertising (about 14%).

Figure 19: Reasons for spending money on microtransactions in F2P games

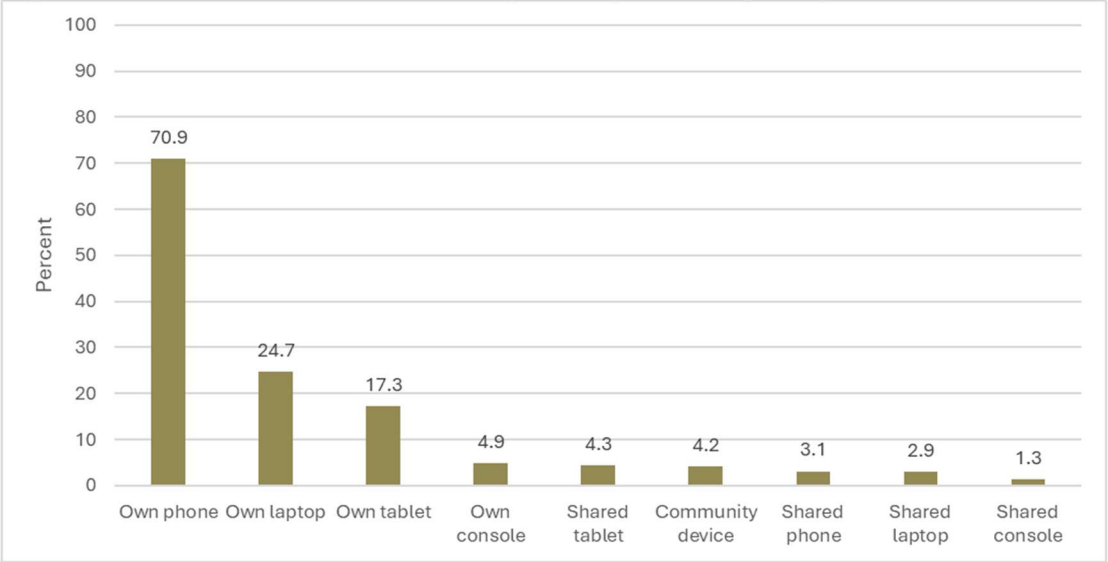


Multiple responses were allowed

5.5 Devices to access online gambling and F2P gaming

Figure 20 shows that 70.9% of participants accessed online gambling and F2P gaming via their smartphones, 24.7% used their laptop and 17.3% used their tablet. A personal console and shared devices were each used by less than 5% of participants. Participants could access online gambling and F2P gaming using more than one type of device.

Figure 20: Devices used to access online gambling and F2P gaming



Multiple responses were allowed

5.6 Online gambling and F2P gaming risk

Table 3 shows that the percentage of participants with any level of gambling risk (low, moderate and problem) was substantially higher for mixed gambler-F2P gamers (58.9%) compared with online gamblers (34.3%). Similarly, the percentage of participants with moderate risk/problem gambling was much higher for mixed gambler-F2P gamers (39.9%) compared with online gamblers (14.7%). The mean PGSI score was 1.2 for online gamblers (equating to overall low risk) and 3.6 for mixed gambler-F2P gamers (equating to overall moderate risk).

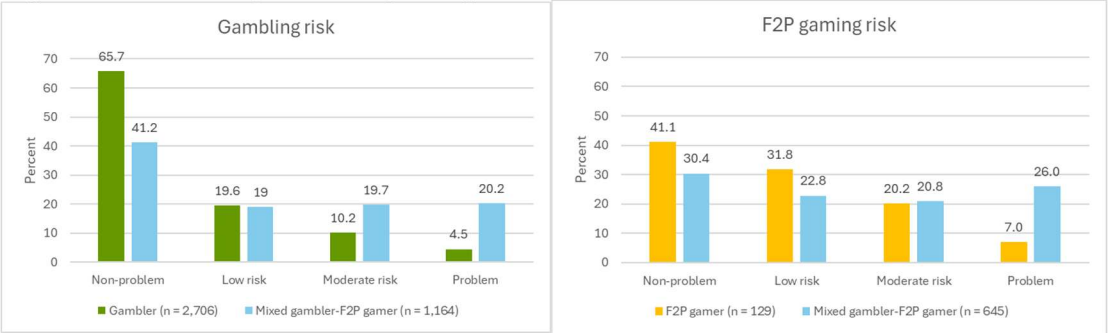
Likewise, the percentage of participants with any level of F2P gaming risk was higher for mixed gambler-F2P gamers (69.6%) compared with F2P gamers (59.0%), and for moderate risk/ problem gaming was 46.8% for mixed gambler-F2P gamers compared with 27.2% for F2P gamers. The mean PGSI-P2W score was 2.0 for F2P gamers (equating to overall low risk) and 4.5 for mixed gambler-F2P gamers (equating to overall moderate risk).

Figure 21 shows these data graphically.

Table 3: Gambling and F2P gaming risk

	Gambling risk				F2P gaming risk			
	Online gambler		Mixed gambler-F2P gamer		F2P gamer		Mixed gambler-F2P gamer	
PGSI risk level	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
No problem	1,777	65.7	479	41.2	53	41.1	196	30.4
Low risk	531	19.6	221	19.0	41	31.8	147	22.8
Moderate risk	276	10.2	229	19.7	26	20.2	134	20.8
Problem	122	4.5	235	20.2	9	7.0	168	26.0
Total	*2,706*	*100*	*1,164*	*100*	*129*	*100*	*645*	*100*
Missing	64		23		94		542	

Figure 21: Gambling and F2P gaming risk



As a sensitivity check, the analysis for gambling risk was repeated with the removal of participants who *only* gambled on Lotto, given that lottery playing is a non-continuous activity generally associated with lower gambling risk. This supplementary analysis showed higher percentages of gambling risk amongst online gamblers and mixed gambler-F2P gamers compared with analyses when Lotto-only participants were included. This indicates that Lotto-only participants have lower risk compared with other gamblers.

Table 4 shows that while the percentage of gamblers and mixed gambler-F2P gamers with moderate risk/problem gambling was 14.7% and 39.9% respectively, when Lotto-only gamblers were excluded, the percentage at this level of risk was 21.9% and 48.1% respectively.

Table 4: Gambling and F2P gaming risk with and without Lotto only gamblers

	Gambling risk (all gamblers)				Gambling risk (excluding Lotto-only gamblers)			
	Online gambler		Mixed gambler-F2P gamer		Gambler		Mixed gambler-F2P gamer	
PGSI risk level	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
No problem	1,777	65.7	479	41.2	746	53.7	273	32.5
Low risk	531	19.6	221	19.0	338	24.4	163	19.4
Moderate risk	276	10.2	229	19.7	212	15.3	189	22.5
Problem	122	4.5	235	20.2	92	6.6	215	25.6
Total	***2,706***	***100***	***1,164***	***100***	***1,388***	***100***	***840***	***100***
Missing	64		23		48		16	

5.6.1 Māori specific findings

A Chi-square test of association found a significant relationship between Ethnicity (Māori vs non-Māori) and gambling risk (no/low risk vs. moderate risk/problem); $\chi^2(1) = 85.58$, $p < 0.001$. Māori respondents had more than twice the odds (OR = 2.27) for moderate risk/problem gambling, compared with non-Māori respondents.

However, there was no association between Ethnicity and F2P gaming risk ($\chi^2(1) = 3.10$, $p = 0.08$). In other words, a similar finding was not noted for F2P gaming risk, with Māori having the same risk as non-Māori.

5.7 Gambling and F2P gaming harm

Mirroring the gambling and F2P gaming risk level patterns, the highest proportions of participants without gambling or gaming harm[9] were online gamblers (73.2%) and F2P gamers (61.2%), respectively. The proportions without harm were lower for mixed gambler-F2P gamers; 47.5% without gambling harm and 46.4% without F2P gaming harm (Table 5).

This means that the percentage of participants with some level of harm was higher for mixed gambler-F2P gamers (53.6% with F2P gaming harm, 52.5% with gambling harm) compared with F2P gamers (38.8%) and online gamblers (26.8%). Most commonly, participants experienced one or two harms though the full range of 10 harms was experienced by all groups apart from F2P gamers who experienced up to 8 gaming harms (Table 5).

Table 5: Gambling and F2P gaming harm

	Gambling harm				F2P gaming harm			
	Gambler		Mixed gambler-F2P gamer		F2P gamer		Mixed gambler-F2P gamer	
No. of harms	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
0	1,976	73.2	550	47.5	79	61.2	299	46.4
1	333	12.3	228	19.7	19	14.7	142	22.0
2	169	6.3	125	10.8	12	9.3	69	10.7
3	87	3.2	95	8.2	9	7.0	53	8.2
4	52	1.9	62	5.3	4	3.1	23	3.6
5	35	1.3	26	2.2	3	2.3	23	3.6
6	18	0.7	22	1.9	0	-	11	1.7
7	11	0.4	20	1.7	1	0.8	4	0.6
8	8	0.3	15	1.3	2	1.6	13	2.0
9	6	0.2	6	0.5	0	-	3	0.5
10	4	0.1	10	0.9	0	-	4	0.6
Total	***2,699***	***100***	***1,159***	***100***	***129***	***100***	***644***	***100***
Missing	1		28		94		543	

Individual harm item data are detailed in Table 6.

The harm reported by the highest proportions of participants across all groups was reduction of available spending money. This ranged from 12.1% of F2P gamers to 30.9% of mixed gambler-F2P gamers.

The percentage of online gamblers reporting reduction in available spending money was 17.2% and less than 10% for all other gambling-related harms, whilst for F2P gamers, 12.1% reported reduction in available spending money and 10.3% reported regrets about their F2P gaming.

Higher proportions of mixed gambler-F2P gamers reported multiple harms with 10% or more reporting reduction of available spending money, reduction in savings, less spending on recreational expenses, and regrets about their gambling or online gaming. Thirteen percent also felt ashamed about their gambling.

[9] Measured using the Short Gambling Harm Screen (SGHS) for gambling harm, and an adapted SGHS (SGHS-F2P) for gaming harm.

Generally, higher proportions of mixed gambler-F2P gamers experienced each type of gambling harm compared with online gamblers. However, for F2P gaming harm, this pattern was only noted for reduction of available spending money, reduction in savings, and less spending on recreational expenses, with higher proportions of F2P gamers reporting all other harms compared with mixed gambler-F2P gamers.

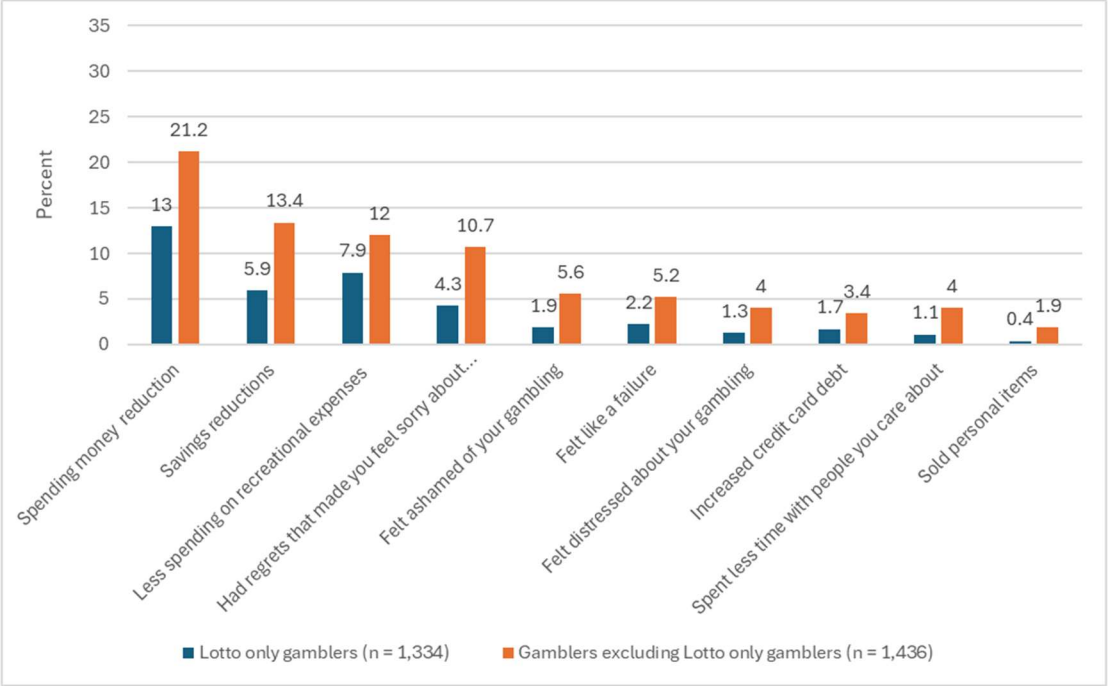
Table 6: Harm item distribution

	Gambling harm				F2P gaming harm			
	Online gambler (n=2,699)		Mixed gambler-F2P gamer (n=1,159)		F2P gamer (n=129)		Mixed gambler-F2P gamer (n=664)	
Harm item	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Reduction of available spending money	477	17.2	367	30.9	27	12.1	185	15.6
Reduction of savings	271	9.8	269	22.7	12	5.4	135	11.4
Less spending on recreational expenses	237	8.6	243	20.5	10	4.5	130	11.0
Had regrets and felt sorry about gambling/gaming	212	7.7	206	17.4	23	10.3	119	10.0
Felt ashamed of gambling/gaming	105	3.8	154	13.0	19	8.5	38	3.2
Felt like a failure	104	3.8	110	9.3	11	4.9	38	3.2
Felt distressed about gambling/gaming	74	2.7	108	9.1	8	3.6	62	5.2
Increased credit card debt	72	2.6	74	2.6	1	0.4	40	3.4
Spent less time with people cared about	73	2.6	93	7.8	13	5.8	74	6.2
Sold personal items to gamble/game	33	1.2	63	5.3	0	-	1	28
Total number of responses	1,658		1,687		124		822	

Note: Row n values relate to number of responses as multiple responses were allowed

When Lotto-only gamblers were compared to other gamblers excluding Lotto-only gamblers, it was apparent that the percentage of participants citing each harm was less for Lotto-only gamblers (Figure 22).

Figure 22: Harm item distribution for Lotto-only gamblers and gamblers excluding Lotto-only gamblers



5.7.1 Māori specific findings

A Chi-square test of association found a significant relationship between Ethnicity (Māori vs non-Māori) and gambling harm (no harm vs. harm); $\chi^2(1) = 77.52$, $p < 0.001$. Māori respondents had more than twice the odds (OR = 2.09) for experiencing gambling harm, compared with non-Māori respondents.

However, there was no association between Ethnicity and F2P gaming harm (PGSI-P2W ($\chi^2(1) = 1.04$, $p = .31$)). In other words, a similar finding was not noted for F2P gaming harm with Māori having the same risk of experiencing F2P gaming harm as non-Māori.

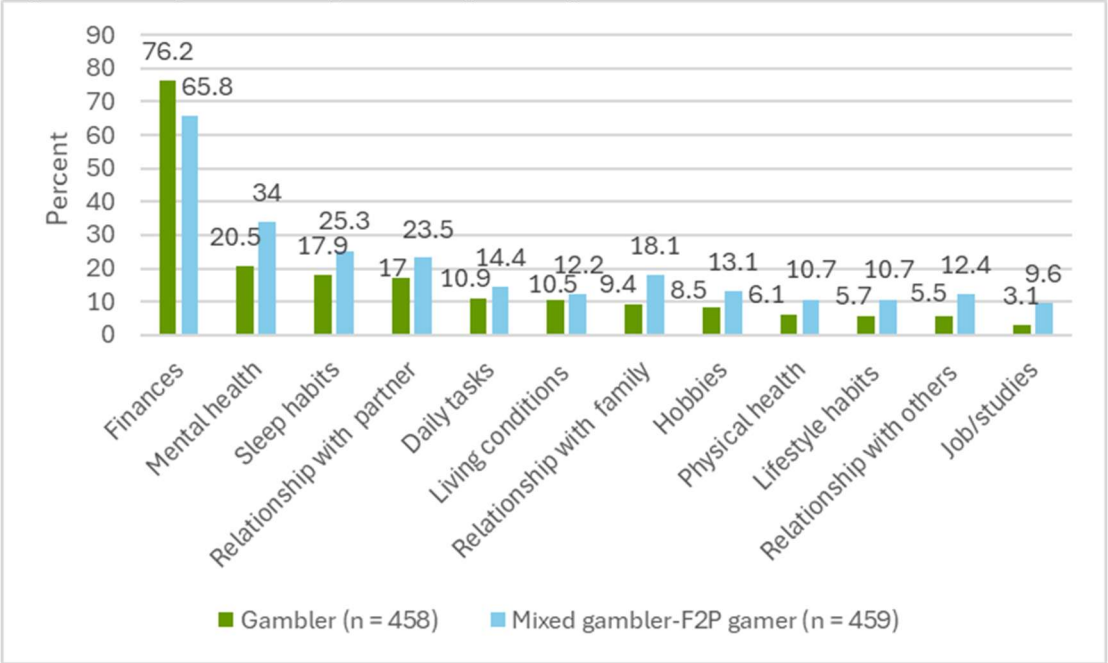
5.8 Negative consequences of gambling

Eighty-two percent (n = 2,262) of online gamblers reported that there were no negative consequences of their gambling[10], whilst 60% (n = 709) of mixed gambler-F2P gamers reported the same.

Of participants who reported negative consequences, financial issues were the most common; reported by 76.2% of online gamblers and 65.8% of mixed gambler-F2P gamers. For all other negative consequences, a higher proportion of mixed gambler-F2P gamers reported the effect compared with online gamblers (Figure 23).

[10] Participants were not asked about negative consequences of F2P gaming due to constraints on the survey length and time to complete, as well as budgetary constraints.

Figure 23: Negative consequences of gambling



Multiple responses were allowed

5.9 Gambling behaviours and influencing factors

5.9.1 Reducing or quitting gambling

Participants were asked if they had attempted to reduce or quit gambling in the prior year; 75% of online gamblers (n = 2,067) and 53% (n = 621) of mixed gambler-F2P gamers reported that they had never tried to do either of these. About 20% were able to quit or pause (n = 299), or reduce their gambling (n = 255), whilst two percent (n = 59) tried but were unsuccessful. Among mixed gambler-F2P gamers, about 40% successfully reduced (n = 214), or quit/paused gambling (n = 250), whilst six percent (n = 60) tried but were unsuccessful.

Of the 299 online gamblers who had quit or paused their gambling, 20.4% (n = 61) resumed gambling due to incentives from a gambling provider (e.g. a bonus), and 10.4% (n = 31) restarted gambling because of general advertisements from gambling providers (e.g. in newsletters or emails).

Of the 214 mixed gambler-F2P gamers who had quit or paused their gambling, 38% (n = 81) resumed gambling due to incentives from a gambling provider, and 16% (n = 34) restarted gambling because of general advertisements from gambling providers.

5.9.2 Virtual money gambling leading to real money gambling

Participants who gambled with virtual (play money) were asked the question "How closely would you say that play money gambling has led you to gamble for real money?"

Of online gamblers, 25.5% (n = 263) reported that virtual money gambling had led them to gamble with real money. The percentage was higher for mixed gambler-F2P gamers with

60.3% (n = 416) reporting that virtual currency gambling had led to their participation in real money gambling.

5.9.3 Contribution to negative effects of gambling

Participants who were classified as moderate risk or problem gamblers or who reported at least one gambling harm were asked whether they thought gambling-related negative effects were associated mainly with gambling online, land-based gambling, or equally with both.

Of gamblers, 38.2% (n = 297) attributed their negative effects mainly to online gambling, followed by 22.2% (n = 173) who reported equal impact from online and land-based gambling. A smaller proportion, 13.9% (n = 108), identified land-based gambling as the main cause.

Of mixed gambler-F2P gamers, 44.2% (n = 285) reported online gambling as the primary source of negative effects, 25% (n = 161) reported equal impact from online and land-based gambling, and 18.4% (n = 119) attributed negative effects mainly to land-based gambling.

When asked which online gambling activities contributed more negative effects, Lotto was most often reported (58.8% online gamblers, 38.3% mixed gambler-F2P gamers). This was followed by online electronic gaming machines (EGMs; 12.8% and 27.8%, respectively), sports betting (11.7% and 9.4%) and scratch cards 8.6% and 8.7%). Other online activities were reported by lower percentages of respondents. For most activities except Lotto and sports betting, higher proportions of mixed gambler-F2P gamers compared with online gamblers reported the activity to be the main contributor to negative effects (Figure 24). When participants who only gambled on Lotto were removed from the analysis, online Lotto remained the most common reported activity causing harm for online gamblers (34%); however, for mixed gambler-F2P gamers the most common activity became online EGMs (34.8%) (Figure 25). It is of note that 4.1% of mixed gambler-F2P gamers cited that virtual sports betting was the main harmful activity compared with only one percent of online gamblers (Figure 25).

Figure 24: Online gambling activities contributing negative effects - all gamblers

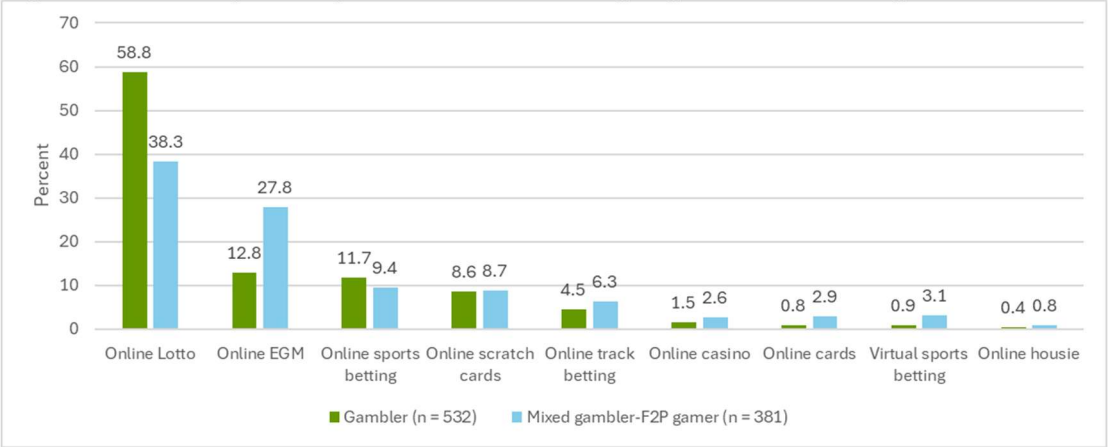
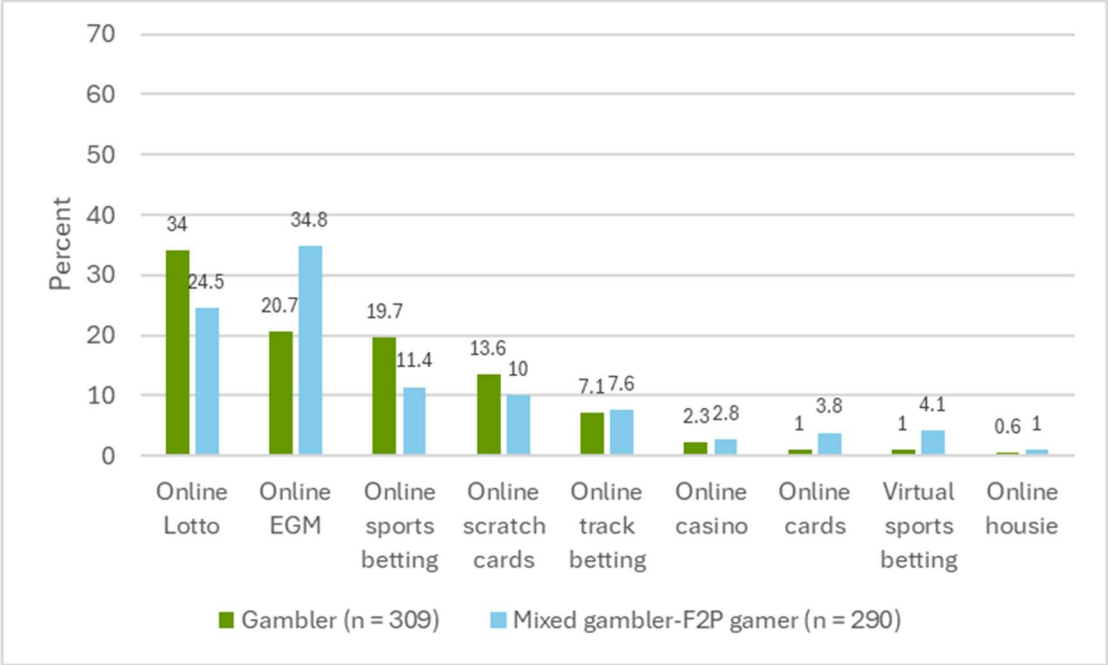


Figure 25: Online gambling activities contributing negative effects - Excluding Lotto only gamblers



5.10 Associations with gambling risk level and harm: Binary logistic regression

5.10.1 Demographics: Gender, ethnicity and age

Table 7 details binary (univariate) logistic regression[11] results of association of gender, ethnicity and age with gambling risk level and gambling harm.

Compared with males, females had a 30% lower risk of being a moderate risk/problem gambler and 18% lower risk of experiencing any gambling harm.

Māori, Pacific and Asian participants all had higher risk of moderate risk/problem gamblers (2.38, 2.55 and 2.23 times higher, respectively), and higher risk of experiencing any gambling harm (1.76, 1.70 and 1.59 times higher, respectively), compared with European/Other participants.

Compared with participants aged 18 to 24 years, all older participants had lower risk for being moderate risk/problem gamblers, with the oldest age group of 55 years and older having the lowest risk ratio of 0.35. Similarly, lower risk for experiencing any gambling harm were noted for the 35-to-54-year and 55+ year age groups, compared with the 18-to-24-year age group.

[11] This analysis looks at each variable individually to identify potential relationships with gambling risk level and harm. This helps identify important variables to include in the multivariate model in which all the significant univariate variables are included together to see which still has a significant relationship with gambling risk level and harm when the others are taken into account.

Table 7: Gender, ethnicity and age associations with gambling risk level and harm: Binary logistic regression

	Gambling risk level					Gambling harm				
Demographic	**No/LR %**	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Gender					**<0.001**					**<0.001**
Male (reference)	76.2	23.8				64.9	35.1			
Female	81.0	19.1	0.64 (0.55, 0.76)	0.70		68.3	31.7	0.75 (0.65, 0.87)	0.82	
Ethnicity					**<0.001**					**<0.001**
European/Other (reference)	85.9	14.1				74.0	26.0			
Māori	65.0	35.0	3.08 (2.50, 3.80)	2.38		51.9	48.1	2.41 (2.00, 2.90)	1.76	
Pacific	59.0	41.0	3.41 (2.10, 5.50)	2.55		50.0	50.0	2.25 (1.42, 3.58)	1.70	
Asian	61.8	38.2	2.80 (2.20, 3.40)	2.23		51.3	48.7	2.00 (1.64, 2.42)	1.59	
Age (years)					**<0.001**					**<0.001**
18 - 24 (reference)	53.0	47.0				42.0	58.0			
25 - 34	64.9	35.1	0.63 (0.40, 0.90)	0.76		51.2	48.8	0.72 (0.49, 1.06)	0.86	
35 - 54	75.6	24.4	0.40 (0.28, 0.58)	0.56		63.2	36.8	0.46 (0.30, 0.60)	0.67	
55+	87.4	12.6	0.22 (0.15, 0.32)	0.35		78.0	22.0	0.26 (0.18, 0.37)	0.46	

Bold font highlights statistical significance
LR = low risk gambling, MR/Prob = moderate risk/problem gambling
95% CI = 95% Confidence Interval

5.10.2 Demographics: Income, area of residence and employment

Table 8 details binary (univariate) logistic regression results of association of income, area of residence and employment with gambling risk and gambling harm.

In comparison with having an annual personal income of $20,000 or less, participants who earned $50,001 to $100,000 or more than $100,000 had lower risk for being moderate risk/ problem gamblers (28% and 58% lower, respectively). In terms of experiencing any gambling harm, participants in all income groups earning more than $20,000 per annum had lower risk compared with participants on the lowest annual income bracket.

Participants in paid employment (full or part time) had 1.5 times increased risk of being moderate risk/problem gamblers, and of experiencing any gambling harm.

Compared with participants who lived in Auckland, those who lived elsewhere had lower risk for being moderate risk/problem gamblers. The exception to this was participants who lived in

the Wellington/Porirua/Upper Hutt/Hutt City area who did not show any association with moderate risk/problem gambling, compared with people living in Auckland. A similar finding was noted for experiencing any gambling harm, with participants living in Christchurch also not showing any significant difference from participants living in Auckland.

Table 8: Income, area of residence and employment associations with gambling risk level and harm: Binary logistic regression

	Gambling risk level					Gambling harm				
Demographic	**No/LR %**	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Annual personal income					**<0.001**					**<0.001**
≤ $20,000 (reference)	73.9	26.1				57.4	42.7			
$20,001 - $50,000	76.8	23.2	0.76 (0.55, 1.05)	0.81		66.9	33.1	0.58 (0.40, 0.70)	0.71	
$50,001 - $100,000	75.2	24.8	0.65 (0.47, 0.90)	0.72		61.0	39.0	0.57 (0.40, 0.80)	0.70	
> $100,000	83.6	16.4	0.35 (0.24, 0.50)	0.42		74.0	26.0	0.29 (0.21, 0.40)	0.42	
Area of residence					**<0.001**					**<0.001**
Auckland (reference)	74.2	25.8				64.2	35.8			
Christchurch	78.2	21.8	0.73 (0.53, 0.98)	0.79		64.9	35.1	0.91 (0.69, 1.19)	0.94	
Wellington/ Porirua/Upper Hut/Hut City	77.6	22.4	0.83 (0.62, 1.10)	0.79		63.5	36.5	1.06 (0.83, 1.37)	0.88	
Rest of North Island	81.0	19.0	0.74 (0.52, 0.78)	0.62		68.6	31.4	0.82 (0.70, 0.90)	0.82	
Rest of South Island	82.1	18.0	0.55 (0.42, 0.71)	0.87		69.2	30.8	0.75 (0.60, 0.93)	1.04	
Employment					**<0.001**					**<0.001**
No (reference)	81.9	18.1				72.6	27.4			
Yes	76.9	23.1	1.70 (1.36, 2.13)	1.51		64.0	36.0	1.90 (1.55, 2.32)	1.52	

Bold font highlights statistical significance
LR = low risk gambling, MR/Prob = moderate risk/problem gambling
95% CI = 95% Confidence Interval

5.10.3 Frequency of online gambling participation

Binary (univariate) logistic regression analyses showed that being a mixed gambler-F2P gamer increased the risk of being a moderate risk/problem gambler by almost three times, compared with online gamblers. For gambling harm, the risk was almost double for mixed gambler-F2P gamers compared with online gamblers (Table 9).

Table 9: Gambler type associations with gambling risk level and harm: Binary logistic regression

	Gambling risk level					Gambling harm				
Gambler type	**No/LR %**	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Online gambler (Reference)	85.6	14.4			**<0.001**	73.9	26.1			**<0.001**
Mixed gambler-F2P gamer	60.9	39.1	3.83 (3.27, 4.48)	2.72		48.7	51.3	2.98 (2.59, 3.47)	1.97	

Bold font highlights statistical significance
LR = low risk gambling, MR/Prob = moderate risk/problem gambling
95% CI = 95% Confidence Interval

Table 10 details binary logistic regression results of association of online gambling frequency with gambling risk level and gambling harm.

Participants who engaged in online gambling for real money several times a week or daily had about twice the risk of being a moderate risk/problem gambler than participants who engaged in online gambling less than monthly. These participants also had higher risk of experiencing gambling harm. It is noteworthy that participants who engaged in online gambling for *virtual* money had higher risk of being a moderate risk/problem gambler and of experiencing gambling harm at lower participation frequencies; both noted at all frequencies compared with gambling for virtual money less than monthly.

All levels of online gambling participation greater than 15 minutes per session, for both real or virtual money, were associated with higher risk of being a moderate risk/problem gambler and for experiencing gambling harm, compared with sessions of fewer than 15 minutes duration. The risk increased with increasing gambling session length.

Table 10: Online gambling frequency associations with gambling risk level and harm: Binary logistic regression

	Gambling risk level					Gambling harm				
Frequency of online gambling	**No/LR %**	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
For *real money* per *year*					**≤0.001**					**≤0.001**
< Monthly (reference)	90.0	10.0				76.5	23.5			
Monthly	83.3	16.7	0.90 (0.50, 1.40)	0.91		70.5	29.5	0.67 (0.44, 1.02)	0.73	
2-3 times/ month	77.8	22.2	1.09 (0.73, 1.64)	1.08		62.9	37.1	1.04 (0.72, 1.50)	1.03	
Weekly	76.2	23.8	1.28 (0.85, 1.90)	1.25		65.0	35.0	1.03 (0.72, 1.46)	1.02	
Several times/week	61.5	38.5	2.01 (1.32, 3.07)	1.83		52.4	47.6	1.73 (1.17, 2.57)	1.48	
Daily	37.5	62.5	2.25 (1.03, 4.92)	2.00		33.3	66.7	2.12 (0.93, 4.8)	1.68	

Frequency of online gambling	Gambling risk level					Gambling harm				
	No/LR %	MR/ Prob %	Odds Ratio (95% CI)	Risk ratio	p-value	No harm %	Harm %	Odds Ratio (95% CI)	Risk ratio	p-value
For *virtual money* per *year*					**≤0.001**					**≤0.001**
< Monthly (reference)	81.5	18.5				68.5	31.5			
Monthly	69.6	30.4	1.93 (1.28, 2.93)	1.65		59.7	40.3	1.64 (1.13, 2.40)	1.37	
2-3 times/ month	62.6	37.4	2.44 (1.68, 3.54)	1.93		48.8	51.2	1.17 (1.54, 3.05)	1.11	
Weekly	58.5	41.5	2.60 (1.80, 3.70)	2.00		48.3	51.7	2.15 (1.53, 3.01)	1.10	
Several times/week	42.8	57.2	3.80 (2.61, 5.69)	2.50		36.4	63.6	2.62 (1.81, 3.80)	1.74	
Daily	29.4	70.6	9.30 (4.70, 18.3)	3.67		22.1	77.9	7.13 (3.44, 14.80)	2.43	
For *real money* per *session*					**≤0.001**					**≤0.001**
< 15 mins. (reference)	92.0	8.00				78.2	21.8			
15-30 mins.	69.6	30.4	2.72 (1.85, 4.00)	2.39		55.7	44.3	2.0 (1.41, 2.80)	1.64	
30-60 mins.	48.8	51.2	4.71 (3.10, 7.20)	3.63		40.0	60.0	3.64 (2.40, 5.40)	2.30	
1-2 hours	38.9	61.1	5.46 (3.30, 8.90)	4.02		31.3	68.7	4.61 (2.80, 7.60)	2.58	
≥ 2 hours	26.7	73.3	8.06 (4.67, 13.90)	5.15		25.1	74.9	5.64 (3.28, 9.72)	2.80	
For *virtual money* per *session*					**≤0.001**					**≤0.001**
< 15 mins. (reference)	87.3	12.7				72.1	27.9			
15-30 mins.	61.4	38.6	2.17 (1.47, 3.20)	1.89		49.1	50.9	1.55 (1.09, 2.19)	1.34	
30-60 mins.	39.3	60.7	3.70 (2.43, 5.64)	2.76		31.8	68.2	2.19 (1.47, 3.27)	1.64	
1-2 hours	35.5	64.5	3.62 (2.19, 6.00)	2.72		28.3	71.7	2.14 (1.31, 3.5)	1.62	
≥ 2 hours	18.6	81.4	7.28 (4.20, 12.90)	4.05		19.3	80.7	3.10 (1.78, 5.41)	2.00	

Bold font highlights statistical significance
LR = low risk gambling, MR/Prob = moderate risk/problem gambling
95% CI = 95% Confidence Interval

5.10.4 Number of gambling activities and monthly online expenditure

Table 11 details binary logistic regression results of association of number of gambling activities participated in and monthly online gambling expenditure with gambling risk level and gambling harm.

For every additional online or land-based gambling activity participated in, the odds of being a moderate risk/problem gambler increased by 45% and 38%, respectively, and increased by 35% and 29% respectively for experiencing any gambling harm.

Typically spending $51 or more per month on online gambling increased the risk of being a moderate risk/problem gambler by almost double (expenditure $51 - $100) or more than double (expenditure $101+), compared to having a monthly expenditure of $10 or fewer. A similar finding was noted for experiencing any gambling harm with increased risk of 1.39 and 1.53 for the two expenditure ranges, respectively.

Table 11: Number of gambling activities and online expenditure associations with gambling risk level and harm: Binary logistic regression

	Gambling risk level					**Gambling harm**				
	No/LR median /%	**MR/ Prob median /%**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm median/ %**	**Harm median /%**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
No. of *online* gambling activities	1.0	2.0	1.45 (1.34, 1.58)		**<0.001**	1.0	2.0	1.35 (1.26, 1.46)		**<0.001**
No. of *land-based* gambling activities	1.0	2.0	1.38 (1.29, 1.48)		**<0.001**	1.0	2.0	1.29 (1.21, 1.38)		**<0.001**
Monthly *online* gambling expenditure					**<0.001**					**<0.001**
≤ $10 (reference)	86.5	13.5				73.8	26.2			
$11 - $20	87.1	12.9	0.87 (0.62, 1.23)	0.89		73.2	26.9	0.98 (0.76, 1.27)	0.99	
$21 - $50	81.4	18.6	1.26 (0.90, 1.71	1.22	**<0.001**	68.8	31.2	1.14 (0.89, 1.45)	1.10	**<0.001**
$51 - $100	69.2	30.8	2.02 (1.48, 2.77)	1.78		57.2	42.8	1.61 (1.24, 2.08)	1.39	
> $100	59.3	40.7	2.67 (7.93, 3.70)	2.18		49.9	50.1	1.88 (1.43, 2.46)	1.53	

Bold font highlights statistical significance
LR = low risk gambling, MR/Prob = moderate risk/problem gambling
95% CI = 95% Confidence Interval

5.11 Risk factors for moderate risk/problem gambling and any gambling harm: Multivariable analyses

Multivariable analyses were performed to investigate risk factors for moderate risk/problem gambling and gambling harm, with all significant variables from the previously detailed binary logistic regression analyses included in the model. Table 12 details the variables that remained significantly associated. Variables that were no longer significant in the multivariable model were area of residence, number of online gambling activities participated in, and monthly online gambling expenditure (shown in Appendix 4, Table A).

Ethnicity remained strongly associated with both moderate risk/problem gambling and with experiencing any gambling harm, although the findings were slightly different from the univariate analyses. Only Asian ethnicity was associated with moderate risk/problem gambling (1.81 times higher risk) compared with European/Other ethnicity, whilst both Māori and Asian ethnicities were associated with increased risk of experiencing any gambling harm (1.28 and 1.42 times higher, respectively).

Being aged 55 years or older, compared with age 18 to 24 years, remained strongly associated with *lower* risk of moderate risk/problem gambling (71% lower), and with experiencing any gambling harm (59% lower), compared with participants aged 18 to 24 years. Having an annual personal income of $50,001 or more compared with $20,000 or less, also remained associated with a *lower* risk of moderate risk/problem gambling or experiencing any gambling harm.

Gender remained weakly associated with risk of experiencing any gambling harm but not with being a moderate risk/problem gambler. Females had 14% *lower* risk of experiencing any gambling harm compared with males. Conversely, being employed was weakly associated with increased risk of experiencing any gambling harm (1.34 times higher) but not with moderate risk/problem gambling, compared with participants who were not employed.

Frequency of gambling online with *virtual* money per year and per session were both strongly associated with being a moderate risk/problem gambler. Daily gambling with virtual money was associated with 2.64 times the risk compared with less than monthly participation, and virtual money gambling for 15 minutes or more per session was associated with higher risk that increased as session times lengthened, compared with sessions of fewer than 15 minutes. However, session lengths of two hours or more, compared with sessions of fewer than 15 minutes, were only weakly associated with experiencing any gambling harm, at almost twice the risk.

Frequency of gambling online with *real* money per session was strongly associated with being a moderate risk/problem gambler and with experiencing any gambling harm. Real money gambling for 15 minutes or more per session was associated with higher risk of moderate risk/problem gambling that increased as session times lengthened, compared with sessions of fewer than 15 minutes. Similarly, session lengths of 30 minutes or more were associated with higher risk of experiencing any gambling harm that increased as session times lengthened, compared with sessions of fewer than 15 minutes. However, frequency of online gambling for real money per year was only weakly associated with being a moderate risk/problem gambler and for experiencing any gambling harm, with gambling several times a week associated with about 1.5 times increased risk.

For each additional physical gambling activity participated in, the odds of being a moderate risk/problem gambler increased by 20% (strong association) and increased by 16% (weak association) for any gambling harm.

Being a mixed gambler-F2P gamer, compared with being an online gambler, remained weakly associated with increased risk of moderate risk/problem gambling and experiencing any gambling harm.

Table 12: Significant factors for gambling risk level and harm: Multivariable analyses

	Gambling risk level					Gambling harm				
	No/LR median /%	**MR/ Prob median /%**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm median /%**	**Harm median /%**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Gender					0.30					**0.05**
Male (reference)	76.2	23.8				64.9	35.1			
Female	81.0	19.1	0.84 (0.62, 1.16)	0.86		68.3	31.7	0.79 (0.59, 0.90)	0.84	
Ethnicity					**<0.001**					**<0.01**
European/ Other (reference)	85.9	14.1				74.0	26.0			
Māori	65.0	35.0	1.05 (0.71, 1.55)	1.04		51.9	48.1	1.42 (1.09, 2.00)	1.28	
Pacific	59.0	41.0	0.95 (0.44, 2.07)	0.96		50.	50.0	0.90 (0.43, 1.76)	0.92	
Asian	61.8	38.2	2.10 (1.41, 3.10)	1.81		51.3	48.7	1.66 (1.19, 2.30)	1.42	
Age (years)					**<0.001**					**<0.001**
18 - 24 (reference)	53.0	47.0				42.0	58.0			
25 - 34	64.9	35.1	0.59 (0.30, 1.16)	0.63		51.2	48.8	0.82 (0.40, 1.50)	0.86	
35 - 54	75.6	24.4	0.55 (0.29, 1.05)	0.59		63.2	36.8	0.66 (0.30, 1.20)	0.72	
55+	87.4	12.6	0.26 (0.13, 0.51)	0.29		78.0	22.0	0.34 (0.18, 0.62)	0.41	
Annual personal income					**<0.01**					**<0.001**
≤ $20,000 (reference)	73.9	26.1				57.4	42.7			
$20,001 - $50,000	76.8	23.2	0.87 (0.49, 1.50)	0.89		66.9	33.1	0.73 (0.43, 1.19)	0.79	
$50,001 - $100,000	75.2	24.8	0.52 (0.28, 0.90)	0.56		61.0	39.0	0.50 (0.28, 0.90)	0.58	
> $100,000	83.6	16.4	0.32 (0.16, 0.60)	0.35		74.0	26.0	0.30 (0.17, 0.53)	0.37	
Employment					0.98					**0.03**
No (reference)	81.9	18.1				72.64	27.36			
Yes	76.9	23.1	1.00 (0.64, 1.57)	1.00		64.0	36.0	1.53 (1.03, 2.24)	1.34	

	Gambling risk level					Gambling harm				
	No/LR median /%	**MR/ Prob median /%**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm median /%**	**Harm median /%**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Gambling engagement					**0.02**					**0.03**
Online gambler (reference)	85.6	14.4				73.9	26.1			
Mixed gambler-F2P gamer	60.9	39.1	1.32 (0.97, 1.81)	1.26		48.7	51.3	1.35 (1.02, 1.78)	1.24	
No. of *physical* gambling activities	1.0	2.0	1.20 (1.06, 1.36)		**<0.01**	1.0	2.0	1.16 (1.04, 1.20)		**0.01**
Frequency of online gambling for *real money* per *year*					**0.04**					**0.03**
< Monthly (reference)	90.0	10.0				76.5	23.5			
Monthly	83.3	16.7	0.90 (0.48, 1.70)	0.91		70.5	29.5	0.62 (0.40, 1.00)	0.69	
2-3 times/ month	77.8	22.2	0.90 (0.50, 1.55)	0.91		62.9	37.1	0.97 (0.60, 1.50)	0.98	
Weekly	76.2	23.8	1.61 (0.95, 2.74)	1.48		65.0	35.0	1.08 (0.70, 1.70)	1.06	
Several times/ week	61.5	38.5	1.79 (1.00, 3.20)	1.61		52.4	47.6	1.65 (1.00, 2.80)	1.41	
Daily	37.5	62.5	1.46 (0.50, 4.20)	1.37		33.3	66.7	1.56 (0.60, 4.50)	1.36	
Frequency of online gambling for *virtual money* per *year*					**0.001**					0.18
< Monthly (reference)	81.5	18.5				68.5	31.5			
Monthly	69.6	30.4	1.17 (0.70, 2.10)	1.14		59.7	40.3	0.94 (0.60, 1.50)	0.95	
2-3 times/ month	62.6	37.4	1.10 (0.70, 1.80)	1.08		48.8	51.2	1.19 (0.80, 1.90)	1.13	
Weekly	58.5	41.5	1.47 (0.90, 2.40)	1.38		48.3	51.7	1.30 (0.80, 2.00)	1.21	
Several times/ week	42.8	57.2	1.77 (1.00, 3.00)	1.59		36.4	63.6	1.18 (0.70, 1.90)	1.13	
Daily	29.4	70.6	3.64 (1.50, 8.60)	2.64		22.1	77.9	3.08 (1.30, 7.40)	2.00	

	Gambling risk level					Gambling harm				
	No/LR median /%	MR/ Prob median /%	Odds Ratio (95% CI)	Risk ratio	p-value	No harm median /%	Harm median /%	Odds Ratio (95% CI)	Risk ratio	p-value
Frequency of online gambling for *real money* per *session*					**0.001**					**<0.001**
< 15 mins. (reference)	92.0	8.00				78.2	21.8			
15-30 mins.	69.58	30.42	2.23 (1.40, 3.50)	1.90		55.67	44.3	1.38 (0.90, 2.00)	1.26	
30-60 mins.	48.8	51.18	3.82 (3.00, 6.40)	2.72		40.0	60.0	2.33 (1.40, 3.70)	1.73	
1-2 hours	38.9	61.06	3.25 (1.80, 5.80)	2.46		31.3	68.7	2.52 (1.40, 4.40)	1.80	
≥ 2 hours	26.7	73.3	5.30 (2.70, 10.10)	3.28		25.1	74.9	2.73 (1.50, 5.10)	1.88	
Frequency of online gambling for *virtual money* per *session*					**0.001**					**0.02**
< 15 mins. (reference)	87.3	12.7				72.1	27.9			
15-30 mins.	61.4	38.6	1.98 (1.30, 3.10)	1.74		49.1	50.9	1.38 (0.90, 2.10)	1.26	
30-60 mins.	39.3	60.7	2.48 (1.50, 4.08)	2.05		31.8	68.2	1.56 (1.00, 2.50)	1.36	
1-2 hours	35.5	64.5	2.97 (1.70, 5.30)	2.31		28.3	71.7	1.71 (1.00, 2.90)	1.44	
≥ 2 hours	18.6	81.4	6.59 (3.40, 13.0)	3.65		19.3	80.7	2.84 (1.50, 5.40)	1.92	

Bold font highlights statistical significance
LR = low risk gambling, MR/Prob = moderate risk/problem gambling
95% CI = 95% Confidence Interval

5.12 Associations with F2P gaming risk level and harm: Binary logistic regression

5.12.1 Demographics: gender, ethnicity and age

Table 13 details binary logistic regression results of association of gender, ethnicity and age with F2P gaming risk level and harm. This analysis looks at each variable individually.

Gender was not significantly associated with F2P gaming risk level or harm. Māori, Pacific and Asian participants all had higher risk of being moderate risk/problem F2P gamers (1.41, 2.07 and 1.68 times higher, respectively), and higher risk of experiencing any F2P gaming harm (1.23, 1.43 and 1.48 times higher, respectively) than European/Other participants. Note that the finding for Pacific participants and F2P gaming harm should be considered cautiously. Although the risk ratio is 1.43, the 95% confidence intervals are wide and span 1.0 due to the small sample size, and this could be an artefactual result.

Compared with age 18 to 24 years, participants aged 35 years and older had *lower* odds for being a moderate risk/problem F2P gamer, with the lowest risk being for the 55 years and older age group. No association was found between age and F2P gaming harm.

Table 13: Gender, ethnicity and age associations with F2P gaming risk level and harm: Binary logistic regression

	F2P gaming risk level					F2P gaming harm				
Demographic	**No/LR %**	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Gender					0.28					0.27
Male (reference)	53.0	47.0				45.7	54.3			
Female	60.0	40.0	0.85 (0.62, 1.15)	0.91		52.3	47.7	0.84 (0.63, 1.14)	0.92	
Ethnicity					**<0.001**					**<0.001**
European/Other (reference)	65.8	34.2				56.1	43.9			
Māori	50.8	49.2	1.78 (1.24, 2.55)	1.41		45.6	54.4	1.50 (1.05, 2.13)	1.23	
Pacific	27.3	72.7	4.64 (1.76, 12.23)	2.07		36.4	63.6	2.14 (0.87, 5.25)	1.43	
Asian	39.0	61.0	2.59 (1.71, 3.9)	1.68		32.4	67.7	2.35 (1.54, 3.59)	1.48	
Age (years)					**<0.01**					0.06
18 to 24 (reference)	37.5	62.5				41.7	58.3			
25 to 34	49.4	50.6	0.64 (0.32, 1.26)	0.83		38.4	61.6	1.16 (0.60, 2.26)	1.06	
35 to 54	57.7	42.3	0.48 (0.25, 0.91)	0.71		51.5	48.5	0.72 (0.39, 1.35)	0.86	
55+	69.8	30.2	0.35 (0.17, 0.72)	0.59		57.6	42.4	0.68 (0.34, 1.36)	0.84	

Bold font highlights statistical significance
LR = low risk gaming, MR/Prob = moderate risk/problem gaming
95% CI = 95% Confidence Interval

5.12.1 Demographics: Income, area of residence and employment

Table 14 details binary (univariate) logistic regression results of association of income, area of residence and employment with F2P gaming risk level and F2P gaming harm. There were no significant associations.

Table 14: Income, area of residence and employment associations with gaming risk level and harm: Binary logistic regression

	F2P gaming risk level					F2P gaming harm				
Demographic	**No/LR %**	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Annual personal income					0.10					0.07
≤ $20,000 (reference)	56.0	44.0				47.3	52.7			
$20,001 - $50,000	52.4	47.6	1.05 (0.60, 1.85)	1.03		44.5	55.5	1.00 (0.57, 0.77)	1.00	
$50,001 - $100,000	53.9	46.1	0.87 (0.49, 0.57)	0.92		45.8	54.2	0.88 (0.49, 0.58)	0.94	
> $100,000	61.6	38.4	0.59 (0.31, 0.11)	0.72		55.5	44.5	0.55 (0.29, 0.04)	0.72	
Area of residence					0.15					0.46
Auckland (reference)	50.4	49.6				45.3	54.7			
Christchurch	55.7	44.3	0.76 (0.42, 1.38)	0.86		49.2	50.8	0.93 (0.51, 1.67)	0.97	
Wellington/ Porirua/Upper Hut/Hut City	60.4	39.6	0.73 (0.45, 1.20)	0.84		53.8	46.2	1.09 (0.67, 1.78)	1.04	
Rest of North Island	58.7	41.3	0.63 (0.44, 0.92)	0.77		44.6	55.4	0.77 (0.53, 0.12)	0.88	
Rest of South Island	60.4	39.6	0.66 (0.41, 1.06)	0.79		55.8	48.2	0.73 (0.46, 0.17)	0.86	
Employment					0.18					0.25
No (reference)	60.0	40.0				52.5	47.5			
Yes	76.87	44.3	1.39 (0.86, 2.25)	1.20		48.1	51.9	1.32 (0.82, 2.13)	1.15	

LR = low risk gaming, MR/Prob = moderate risk/problem gaming
95% CI = 95% Confidence Interval

5.12.2 Frequency of F2P gaming participation

Binary logistic regression analyses showed that being a mixed gambler-F2P gamer increased the risk of being a moderate risk/problem F2P gamer (1.73 times higher), compared with participating only in F2P gaming. Similarly, for any F2P gaming harm, the odds were increased by 1.38 times for mixed gambler-F2P gamers compared with F2P gamers (Table 15).

Table 15: F2P gamer type associations with gaming risk level and harm: Binary logistic regression

	F2P gaming risk level					F2P gaming harm				
Gamer type	**No/LR %**	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Online gamer (reference)	72.9	27.1			**<0.001**	61.2	38.8			**<0.01**
Online gambler-gamer	53.2	46.8	2.37 (1.56, 3.60)	1.73		46.4	53.6	1.82 (1.34, 2.68)	1.38	

Bold font highlights statistical significance
LR = low risk gaming, MR/Prob = moderate risk/problem gaming
95% CI = 95% Confidence Interval

Table 16 details binary logistic regression results of association of F2P gaming frequency with F2P gaming risk level and harm.

Spending money on microtransactions was significantly associated with being a moderate risk/ problem gamer and with experiencing any gaming harm. The risk increased with increased frequency of microtransaction purchase. The risk of being a moderate risk/problem gamer for participants who made microtransactions monthly was double the risk for participants who made microtransactions less than monthly, with the risk rising to four times higher for making microtransactions several times a week or daily. The risk for any gaming harm ranged from 1.76 times higher to almost three times higher.

The frequency of engaging in F2P gaming per session (i.e. length of session) was also strongly associated with moderate risk/problem gaming and any gaming harm, for sessions of one hour or longer compared with F2P gaming for fewer than 30 minutes per session. There was higher risk for moderate risk/problem gaming and any gaming harm for sessions or two hours or longer (1.66 times and 1.62 times, respectively), than for sessions of one to two hours (1.55 times and 1.40 times, respectively) compared with sessions of fewer than 30 minutes.

Table 16: F2P gaming frequency associations with gaming risk level and harm: Binary logistic regression

	F2P gaming risk level					F2P gaming harm				
Frequency of F2P gaming	**No/LR %**	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Frequency of engaging in F2P gaming *per session*					**<0.001**					**<0.001**
< 30 mins. (reference)	70.3	29.7				61.9	38.1			
30-60 mins.	59.2	40.8	1.24 (0.70, 1.90)	1.16		53.1	46.9	1.17 (0.70, 1.80)	1.10	
1-2 hours	49.4	50.6	2.03 (1.30, 3.20)	1.55		43.1	56.9	1.85 (1.10, 3.00)	1.40	
≥ 2 hours	44.3	55.7	2.31 (1.50, 3.70)	1.66		34.5	65.5	2.63 (1.70, 4.10)	1.62	
Frequency of engaging in microtransactions *per session*					**<0.001**					**<0.001**
< Monthly (reference)	79.0	21.0				69.7	30.3			
Monthly	59.5	40.5	2.64 (1.50, 4.40)	1.96		57.3	42.7	2.64 (1.50, 4.40)	1.76	
2-3 times/ month	48.8	51.2	4.11 (2.60, 6.30)	2.49		43.8	56.2	4.11 (2.70, 6.30)	2.12	
Weekly	34.8	65.2	6.78 (4.00, 11.40)	3.06		18.5	81.5	6.78 (4.00, 11.4)	2.46	
Several times a week/daily	15.0	85.0	19.72 (10.5, 36.7)	4.00		10.0	90.0	19.72 (10.6, 36.7)	2.96	

Bold font highlights statistical significance
LR = low risk gaming, MR/Prob = moderate risk/problem gaming
95% CI = 95% Confidence Interval

5.12.3 F2P gaming expenditure

Binary logistic regression analyses showed that spending higher amounts of money on microtransactions in F2P gaming was associated with higher odds for moderate risk/problem gaming and harm. Participants who spent $5 or more per transaction had almost double the risk for being a moderate risk/problem gamer and about 1.5 times the risk for experiencing any gaming harm, compared with participants who spent less than $5 per transaction. Risk for moderate risk/problem gaming and harm were also noted for loot box purchasing (2.20 and 1.79 times higher, respectively), compared with participants who did not purchase loot boxes. Purchasing loot boxes once a month or more was associated with increased risk of being a moderate risk/problem gamer or experiencing any gaming harm, compared with buying loot boxes less than monthly. The risk increased with increased frequency of loot box purchases (Table 17).

Table 17: F2P gaming expenditure associations with gaming risk level and harm: Binary logistic regression

	F2P gaming risk level					F2P gaming harm				
Expenditure	**No/LR %**	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Typical expenditure in a single microtransaction					**<0.001**					**<0.001**
$1 - $4.99 (reference)	69.9	30.1				60.1	39.9			
$5 - $9.99	48.0	52.0	2.52 (1.77, 3.58)	1.73		39.8	60.2	2.27 (1.61, 3.21)	1.51	
≥ $10	46.2	53.8	2.71 (1.87, 3.90)	1.79		42.4	57.6	2.05 (1.43, 2.93)	1.44	
Spent money on loot boxes					**<0.001**					**<0.001**
No (reference)	71.3	28.7				61.9	38.1			
Yes	36.8	63.3	4.27 (3.15, 5.78)	2.20		31.6	68.4	3.51 (2.60, 4.75)	1.79	
Frequency of expenditure on loot boxes per year					**<0.001**					**<0.001**
< Monthly (reference)	68.3	31.7				60.4	39.6			
1-3 times/ month	30.3	69.7	4.96 (2.70, 8.90)	2.20		26.6	73.4	4.21 (2.30, 7.50)	1.85	
Weekly to daily	10.8	89.2	17.79 (8.60, 36.9)	2.81		8.1	91.9	17.28 (7.80, 38.1)	2.32	

Bold font highlights statistical significance
LR = low risk gaming, MR/Prob = moderate risk/problem gaming
95% CI = 95% Confidence Interval

5.13 Risk factors for moderate risk/problem F2P gaming and any F2P gaming harm: Multivariable analyses

Multivariable analyses were performed to investigate risk factors for F2P gaming risk level and harm, with all significant variables from the binary logistic regression analyses included in the model. Table 18 details the variables that remained significantly associated. The only variables that were no longer significant in the multivariable model were age, ethnicity and F2P gamer category (i.e. F2P gamer or mixed gambler-F2P gamer) (shown in Appendix 4, Table B).

Frequency of session engagement in F2P gaming remained strongly associated with both gaming risk level and harm. Increased risk of being a moderate risk/problem gamer was noted for session lengths of one hour or longer with a risk of ratio of 1.92 times for one to two hours, and 2.23 times for two hours or longer, compared with a session length of fewer than 30 minutes. Session lengths of two hours or longer were also associated with more than double the risk for any F2P gaming harm.

Purchasing loot boxes weekly or daily remained strongly associated with about double the risk of being a moderate risk/problem gamer and with any F2P gaming harm, compared with infrequent loot box purchases of less than monthly.

Frequency of engaging with microtransactions and amount of money spent on microtransactions both remained weakly associated with F2P gaming risk level but not with F2P gaming harm. Participants who spent money on microtransactions several times a week or daily had almost 3.5 times the risk of being a moderate risk/problem gamer than participants who engaged with microtransactions less than monthly. Spending between $5 and $9.99 per

microtransaction was associated with 1.73 times the risk of being a moderate risk/problem gamer, in comparison with spending fewer than $5. However, spending $10 or more per microtransaction was no longer associated with F2P gaming risk in the multivariable analyses when confounding factors were accounted for.

Table 18: Significant factors for F2P gaming risk level and harm: Multivariable analyses

	F2P gaming risk level					F2P gaming harm				
	No/LR %	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Frequency of engaging in F2P gaming *per session*					**<0.001**					**<0.001**
< 30 mins. (reference)	70.3	29.7				61.9	38.1			
30-60 mins.	59.2	40.8	1.40 (0.50, 3.60)	1.25		53.1	46.9	1.26 (0.40, 3.40)	1.15	
1-2 hours	49.4	50.6	3.17 (1.20, 8.20)	1.92		43.1	56.9	2.35 (1.00, 6.00)	1.55	
≥ 2 hours	44.3	55.7	4.63 (1.80, 11.70)	2.23		34.5	65.5	7.5 (2.80, 19.9)	2.16	
Frequency of engaging in microtransactions *per session*					**0.02**					0.09
< Monthly (reference)	79.0	21.0				69.7	30.3			
Monthly	59.5	40.5	1.29 (0.40, 3.50)	1.22		57.3	42.7	1.63 (0.60, 4.40)	1.36	
2-3 times/ month	48.8	51.2	2.52 (1.00, 6.50)	1.78		43.8	56.2	1.91 (0.70, 5.00)	1.48	
Weekly	34.8	65.2	1.42 (0.40, 4.20)	1.31		18.5	81.5	5.07 (1.30, 19.3)	2.23	
Several times a week/daily	15.0	85.0	9.89 (2.10, 46.8)	3.45		10.0	90.0	6.48 (1.50, 31.2)	2.44	
Typical expenditure in a single microtransaction					**0.05**					0.92
$1 - $4.99 (reference)	69.9	30.1				60.1	39.9			
$5 - $9.99	48.0	52.0	2.51 (1.60, 5.40)	1.73		39.8	60.2	1.00 (0.40, 2.20)	1.0	
≥ $10	46.2	53.8	1.86 (0.80, 4.00)	1.47		42.4	57.6	0.88 (0.40, 2.00)	0.92	
Frequency of expenditure on loot boxes per year					**<0.001**					**0.01**
< Monthly (reference)	68.3	31.7				60.4	39.6			
1-3 times/ month	30.3	69.7	2.23 (1.00, 5.20)	1.66		26.6	73.4	2.18 (1.00, 5.20)	1.50	
Weekly to daily	10.8	89.2	8.17 (2.70, 25.9)	2.22		8.1	91.9	6.05 (1.80, 20.4)	2.03	

Bold font highlights statistical significance
LR = low risk gambling, MR/Prob = moderate risk/problem gambling
95% CI = 95% Confidence Interval

5.14 Behavioural and sociodemographic characteristics

5.14.1 Demographic associations with F2P gamer or mixed gambler-F2P gamer

A multinomial logistic regression was run to predict F2P gamer or mixed gambler-F2P gamer category using online gambler as the reference group, by gender, ethnicity and age group. This analysis identified some significant associations (

		F2P gamer			Mixed gambler-F2P gamer			
Demographic	**Online gambler % (reference)**	**%**	**Odds ratio (95% CI)**	**Risk ratio**	**%**	**Odds ratio (95% CI)**	**Risk ratio**	**p-value**
Gender								**<0.001**
Male (reference)	66.8	4.3			28.9			
Female	66.0	6.4	1.32 (0.90, 1.80)	1.30	27.6	0.83 (0.70, 0.90)	0.87	
Ethnicity								**<0.001**
European/ Other (reference)	72.2	5.5			22.2			
Māori	54.3	5.5	1.05 (0.72, 1.50)	1.05	40.2	1.98 (1.64, 2.39)	1.62	
Pacific	49.4	3.7	0.83 (0.30, 2.70)	0.84	46.9	2.28 (1.41, 3.70)	1.78	
Asian	55.8	4.4	0.77 (0.50, 1.21)	0.78	39.8	1.45 (1.18, 1.78)	1.32	
Age (years)								**<0.001**
18 to 24 (reference)		12.1			48.4			
25 to 34	39.5	7.2	0.52 (0.28, 0.96)	0.55	44.8	0.78 (0.53, 1.15)	0.87	
35 to 54	48.0	5.8	0.34 (0.19, 0.61)	0.37	34.9	0.52 (0.36, 0.74)	0.68	
55+	59.3	3.3	0.14 (0.10, 0.30)	0.16	12.0	0.13 (0.10, 0.20)	0.23	

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Ethnicity was significantly associated with being a mixed gambler-F2P gamer compared with being an online gambler, with Māori, Pacific and Asian participants more likely to be mixed online gambler-F2P gamers than European/Other participants. The highest risk was noted for Pacific people at almost twice the risk compared with European/Other participants.

Gender and age were also significantly associated with being a mixed gambler-F2P gamer compared with being an online gambler. Females had 13% lower risk compared with males, and participants aged 35 years or older had lower risk compared with participants aged 18 to 24 years, with the risk decreasing with increasing age. Age was also associated with being a F2P gamer compared with being an online gambler, with lower risk noted for participants aged 25 years or older, and with the risk decreasing with increasing age.

In brief, mixed gambler-F2P gamers were more likely to be male, of Māori, Pacific or Asian ethnicity and aged 18 to 24 years. F2P gamers were more likely to be aged 18 to 24 years, compared with online gamblers.

Table 19: Multivariate logistic regression to predict gambler behaviour category (online gambler - reference group), F2P gamer or mixed gambler-F2P gamer by gender, ethnicity and age group

		F2P gamer			Mixed gambler-F2P gamer			
Demographic	**Online gambler % (reference)**	**%**	**Odds ratio (95% CI)**	**Risk ratio**	**%**	**Odds ratio (95% CI)**	**Risk ratio**	**p-value**
Gender								**<0.001**
Male (reference)	66.8	4.3			28.9			
Female	66.0	6.4	1.32 (0.90, 1.80)	1.30	27.6	0.83 (0.70, 0.90)	0.87	
Ethnicity								**<0.001**
European/ Other (reference)	72.2	5.5			22.2			
Māori	54.3	5.5	1.05 (0.72, 1.50)	1.05	40.2	1.98 (1.64, 2.39)	1.62	
Pacific	49.4	3.7	0.83 (0.30, 2.70)	0.84	46.9	2.28 (1.41, 3.70)	1.78	
Asian	55.8	4.4	0.77 (0.50, 1.21)	0.78	39.8	1.45 (1.18, 1.78)	1.32	
Age (years)								**<0.001**
18 to 24 (reference)		12.1			48.4			
25 to 34	39.5	7.2	0.52 (0.28, 0.96)	0.55	44.8	0.78 (0.53, 1.15)	0.87	
35 to 54	48.0	5.8	0.34 (0.19, 0.61)	0.37	34.9	0.52 (0.36, 0.74)	0.68	
55+	59.3	3.3	0.14 (0.10, 0.30)	0.16	12.0	0.13 (0.10, 0.20)	0.23	

Reference group = Online gambler
Bold font highlights statistical significance
95% CI = 95% Confidence Interval

5.14.2 Behavioural and sociodemographic characteristics of online gambling

To explore typical behavioural and sociodemographic characteristics of online gambling, a two-step cluster analysis was conducted using SPSS (v. 29) with the number of clusters determined automatically. Models were compared with up to 15 clusters using the Bayesian Information Criterion (BIC).

The following predictors were added:

- Frequency of online gambling for real money and virtual money per year (1 = Less than once a month to 3 = Weekly/Daily)
- Time spent on a typical session of online gambling for real money and virtual money (1 = Less than 15 minutes to 4 = 2 hours or more)
- Whether respondent mostly gambled online or in land-based venues, or both equally (1 = Yes)
- Monthly amount of money spent gambling (1 = $10 or less to 5 = $100 or more)
- Whether respondent tried to quit/pause, or reduce their gambling in the last 12 months (1 = Yes), or whether they never tried to stop their gambling (1 = Yes)
- Male or female
- Age category
- Ethnic group
- Whether respondent an online gambler or a mixed gambler-F2P gamer.

Although the best-fitting solution suggested four clusters, these showed considerable overlap and did not provide a clear separation. To improve interpretability, a two-cluster solution was retained. The two-step procedure was based on maximum-likelihood estimation and selected models according to statistical fit indices. Cluster quality was assessed with the silhouette coefficient, yielding a value of 0.3 indicating a fair clustering quality.

The final cluster distribution showed that 46.3% (n = 620) of participants who gambled online were assigned to Cluster 1 and 53.7% (n = 719) to Cluster 2. (Table 20 and Figure 26):

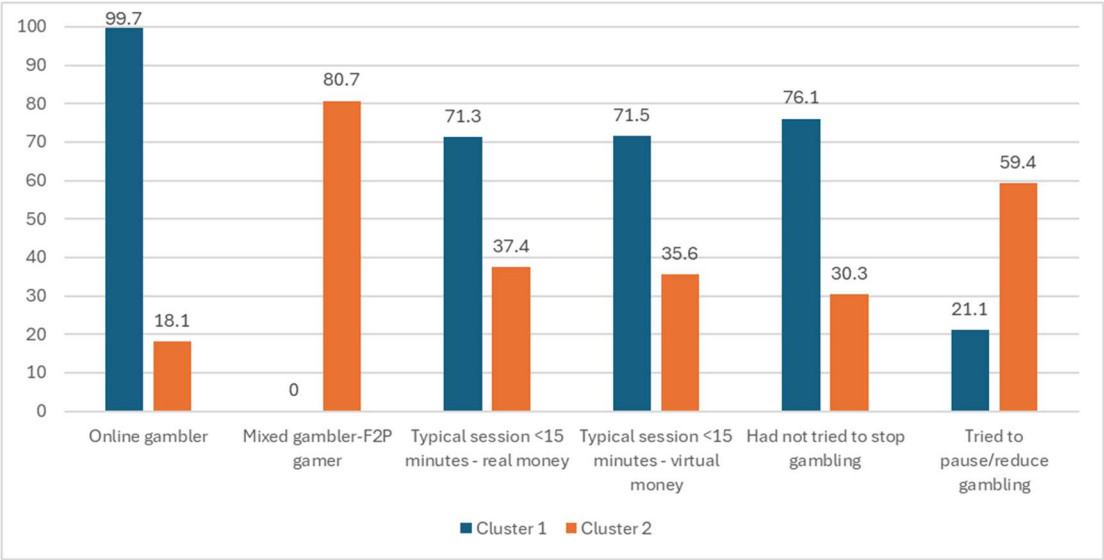
Cluster 1 mostly comprised online gamblers. They generally had not tried to stop or pause online gambling in the past year or had not attempted to reduce their gambling. They tended to have shorter online gambling sessions (fewer than 15 minutes), whether using real or virtual money.

Cluster 2 mostly comprised mixed gambler-F2P gamers. They generally had tried to stop or pause online gambling in the past year or had tried to reduce their gambling. Their online gambling sessions tended to be longer (more than 15 minutes), for real and/or virtual money.

Table 20: Top five clustering characteristics of gambling behaviour

Cluster 1	Cluster 2
Larger proportion categorised as online gambler	Larger proportion categorised as mixed gambler-F2P gamer
Typical online gambling session lasted a shorter time (less than 15 minutes)	Typical online gambling session lasted a longer time (more than 15 minutes)
Typical virtual money gambling session lasted a shorter time (less than 15 minutes)	Typical virtual money gambling session lasted a longer time (more than 15 minutes)
Did not try to stop online gambling in the past 12 months	Tried to stop online gambling in the past 12 months
Did not try to reduce or pause online gambling in the past 12 months	Tried to reduce or pause online gambling in the past 12 months

Figure 26: Graphical depiction of Cluster 1 and Cluster 2 online gamblers



5.14.3 Behavioural and sociodemographic characteristics of F2P gaming

A cluster analysis to identify 'typical' F2P gaming types was conducted entering:

- Time spent playing F2P games in one session (1 = Less than 15 minutes to 4 = 2 hours or more)
- Frequency of playing F2P games and spending money on microtransactions per year (1 = Less than once a month to 3 = Several times per week to daily)
- Money spent in one F2P gaming session (1 = $1 to $2.99, to 5 = $10 or more)
- Spent money on loot boxes (Yes = 1)
- Frequency of loot box expenditure (1 = Less than once a month to 3 = Several times per week to daily)
- Money spent in one session on loot boxes (1 = $1 to $2.99, to 5 = $10 or more)
- Male or female
- Age category
- Ethnic group
- Whether respondent was a F2P gamer or a mixed gambler-F2P gamer.

The BIC suggested that a three-cluster solution provided the best statistical fit. However, cluster quality was low (silhouette coefficient = 0.2), indicating poor separation between clusters. As the identified clusters showed substantial overlap and did not reveal clearly distinct patterns, the results were not interpreted further.

6 DISCUSSION AND CONCLUSION

Gambling activities were originally only land-based, then evolved into online options, with availability currently both online and on land; online gambling can be engaged in for virtual (play) or real currency. Meanwhile, online gaming evolved to commonly include gambling-like activities such as loot boxes (similar to a structured lucky dip) and other fiscal micro-transactions to purchase in-game items or special effects, often to progress in the game or provide advantages over other players. These are known as free-to-play (F2P) games, despite the encouragement of monetary engagement resembling wagering or betting (Cassidy, 2013). Research into this online gambling-F2P gaming convergence is limited, particularly in understanding the relationship between sociodemographic factors and gambling or F2P gaming behaviours with risk and harm. Gaining research evidence on this topic in the New Zealand context is crucial for informing the development of harm reduction and public health policies, especially for vulnerable or at-risk populations who are inequitably affected by online gambling and/or F2P gaming harm. Note that many people play videogames that do not provide micro-transaction opportunities; those games and people were not the focus of this study.

This study explored convergence of F2P gaming and online gambling amongst New Zealand adults via an online survey. To participate in the survey, participants had to engage in online gambling, and/or in F2P gaming and spend money on microtransactions. Māori participants were oversampled to ensure a sufficient sample for separate statistical analyses. A total of 4,180 adults completed the survey and was categorised into three groups:

1. Online gambler[12]: Gambled for money online but did not participate in F2P games in the prior year.
2. F2P gamer: Engaged in F2P gaming and spent money on microtransactions in the prior year but did not gamble online.
3. Mixed gambler-F2P gamer: Participated both in online gambling and in online F2P gaming and spent money on microtransactions in the prior year.

The **main hypothesis** of our study was that the prevalence of adults who participate in F2P gaming and who spend money on microtransactions would be lower than the prevalence of online gamblers. This hypothesis was supported with two-thirds of the survey respondents being online gamblers and only 5.3% being F2P gamers. The percentage of online gamblers is more than double that reported in the general population 2023/24 New Zealand Gambling Survey (NZGS; 31.1%; Health NZ and Kupe, 2025) and is likely to be because respondents had to be online gamblers or F2P gamers to take part in our survey (as opposed to the general population surveyed in the NZGS). The percentage of F2P gamers in our study was only marginally higher than the percentage of adults in the NZGS who spent money on microtransactions in video games (4.3%). Together, these indicate that our study findings cannot be extrapolated to the general New Zealand adult population but, instead, are more likely to be reflective of the community of online gamblers and F2P gamers who spend money on microtransactions.

The **secondary hypothesis** was that there would be a minority of adults who gamble online and spend money on microtransactions in F2P games. This hypothesis was also supported as 28.4% of participants were mixed gambler-F2P gamers. Although a minority of the respondents, at more than one-quarter, the percentage is not insubstantial.

[12] Almost one-quarter (23%) of online gamblers also took part in online gaming but never made micro-transactions.

There were two **aims** to the research, which were to understand:

1. Sociodemographic and behavioural characteristics in monetary engagement in F2P gaming and online gambling (i.e. frequency of engagement, expenditure, and influencing factors).
2. How engagement relates to F2P gaming and gambling risk and harm.

Behavioural and sociodemographic characteristics of monetary engagement in F2P gaming and online gambling

Sociodemographic characteristics

The NZGS found that males aged 15 to 44 years were more likely to be online gamblers than females of similar age (Health NZ and Kupe, 2025). Our study found a similar gender difference with slightly higher proportions of males being online gamblers or mixed gambler-F2P gamers, though F2P gamers comprised a slightly higher proportion of females. Prior research initially identified online gaming as a male dominated activity (see Veltri et al., 2014 for a review), although Veltri et al. (2014) mentioned that "female participation in games continues to grow". A later review noted that half of gamers are females (Lopez-Fernandez et al., 2019) and our study indicates F2P gaming is popular with women with 53% of F2P gamers being female. Our study also identified that 28.2% of F2P gamers and 29.5% of mixed gambler-F2P gamers were aged 18 to 34 years, compared with only 12.8% of online gamblers. For the latter group, 47.2% were in the oldest age group of 55 years or more. This indicates that whilst all age groups participated in online gambling and/or F2P gaming, the former was more likely to be preferred by older adults whilst the latter was more favoured by younger adults. Adults who took part in both activities were also generally younger than 55 years.

Māori, Pacific and Asian people were more likely to be mixed gambler-F2P gamers compared with being online gamblers or F2P gamers. *Thus, public health and harm reduction initiatives should focus on these populations, not just in relation to gambling, but with concurrent consideration of F2P gaming behaviours, alongside gender and age considerations.*

Behavioural characteristics

Seventy-one percent of participants accessed online gambling and F2P gaming via personal smartphones, 24.7% through personal laptops and a further 17% through personal tablets. Although some participants used personal gaming consoles and shared devices, as most used personal mobile devices, accessibility was potentially unlimited.

<u>Gambling</u>

Our study found that mixed gambler-F2P gamers generally exhibited riskier gambling behaviours than online gamblers. This difference was apparent in the various gambling behaviours that were assessed by the survey.

Apart from purchasing Lotto tickets, which was similar for online gamblers and mixed gambler-F2P gamers and engaged in by most participants, a higher percentage of mixed gambler-F2P gamers took part in each gambling activity. The most common online gambling activities (apart from Lotto) were purchasing scratch tickets followed by sports betting and electronic gaming machines. As Lotto is drawn twice weekly, reported gambling frequency was as expected.

Forty-four percent of online gamblers and 46.9% of mixed gambler-F2P gamers reported being regular gamblers in that they gambled once a week or more often, though only a small percentage of participants (less than 4%) reported gambling daily. A higher frequency of gambling has previously been found to be associated with increased risk of developing moderate risk/problem gambling behaviours (Abbott et al., 2014). Most online gamblers and mixed gambler-F2P gamers also gambled at land-based venues; however, 53.6% of online gamblers and 59.9% of mixed gambler-F2P gamers reported gambling more online than on land-based gambling. Furthermore, a substantially higher percentage of mixed gambler-F2P gamers spent more time gambling online than intended; 26.9% compared with 11% of online gamblers. *This highlights the importance of robust harm minimisation measures for online gambling, given that there is no human interaction that could offer potential for early intervention, if necessary*.

Previous studies have identified that participation in higher numbers of gambling activities is associated with increased risk of developing moderate risk/problem gambling behaviours (Abbott et al., 2018; Phillips et al., 2013). Our study identified that whilst 55.9% of online gamblers only gambled on one activity and a further 38.9% gambled on two or three activities, the profile was different for mixed gambler-F2P gamers with only 34.4% gambling on one activity and 45.8% gambling on two to three activities. A similar pattern was observed in relation to time spent gambling in a typical session with a higher proportion of mixed gambler-F2P gamers gambling for longer session times than online gamblers. This raises the risk for development of risky gambling behaviours as was previously identified in the New Zealand National Gambling Study (Abbott et al., 2014). A positive finding was that typical monthly expenditure on online gambling activities in the past 12 months was similar between gamblers and mixed gambler-F2P gamers with the highest proportions (about 28%) spending in the $21 to $50 range.

Our study identified two different typologies of online gamblers, broadly clustering them into: 1) Online gamblers who had not tried to change their gambling behaviour over the prior year and generally had online gambling sessions lasting fewer than 15 minutes, and 2) Mixed gambler-F2P gamers who generally had tried to change their gambling behaviour in the prior year and who typically had online gambling sessions of more than 15 minutes. These findings indicate that online gamblers and mixed gambler-F2P gamers in our study had different characteristics.

Considered together, all our findings are important for informing public health and harm minimisation efforts, as well as for the providers of such activities, in terms of host responsibility. They are particularly important for mixed gambler-F2P gamers who demonstrated behaviours that are potentially higher risk for the development of problematic gambling, compared with online gamblers.

F2P gaming

Similarly, our study identified that mixed gambler-F2P gamers generally exhibited riskier gaming behaviours than F2P gamers. Again, this difference was apparent in the various F2P gaming behaviours that were assessed by the survey.

A higher proportion of F2P gamers, compared with mixed gambler-F2P gamers, participated in regular (weekly or more often) F2P gaming with available microtransactions. However, examination of frequency of spending money on microtransactions showed a different pattern. Twenty-eight percent of mixed gambler-F2P gamers regularly made microtransactions compared with 9.9% of F2P gamers. A similar pattern, but with higher percentages, was noted specifically for loot box purchases. Although expenditure on each microtransaction was

generally similar between F2P gamers and mixed gambler-F2P gamers, a higher proportion of F2P gamers reported spending in the $3 to $4.99 range on microtransactions and $10 or more per transaction on loot boxes. However, with a small sample size, the latter finding could be artefactual and should be considered cautiously. A systematic review of the relationship between microtransaction purchases and problem behaviours identified that frequency of purchases is associated with both problematic gaming and gambling (Gibson et al., 2022). *This has policy implications for regulation of the frequency at which microtransactions are allowed to be available in online video games, or whether certain types of microtransaction, such as loot boxes, should be considered gambling and, therefore, regulated as such.* Additionally, as the number of microtransactions a F2P gamer makes is potentially limitless, *this also has policy implications in terms of whether pre-commitment or maximum spend limits should be considered as a harm minimisation measure, as often occurs with online gambling.*

Furthermore, 49.6% of F2P gamers and 45.8% of mixed gambler-F2P gamers reported that they spent money on microtransactions to take advantage of special offers, and between 18.3% and 42.7% spent money for the following reasons: 'to get the most out of the game', 'to be able to continue playing', 'to increase chances of winning', or 'to get more time in the game'. With some F2P games, it is only possible to advance levels if money is spent on in-game purchases, and the reasons given by our participants indicate this was the case for many. Often, these are 'dark patterns', which are design tactics to encourage choices or behaviours that would not normally be made; in this case, to increase player engagement and spending (Yi, 2024). *Such incentives (special offers) and tactics (spend money to progress in game) are schemes that nudge participants into spending more money and could be considered in regulatory policies for reducing harms from F2P gaming.*

Whilst mixed gambler-F2P gamers tended to have similar gaming session length to F2P gamers, and most gamed for up to two hours in one session, it is important to note that 20.5% of F2P gamers and 23.1% of mixed gambler-F2P gamers gamed for longer sessions extending to 10 or more hours. Increased session lengths are likely to be associated with increased opportunities to spend money on microtransactions. Indeed, in our study, higher percentages of mixed gambler-F2P gamers reported making microtransactions to continue playing games, increase chances of winning or to get more time in the game, than F2P gamers. Whilst lengthy videogaming is not necessarily problematic per se, extended gaming sessions have been found to be associated with physical health issues such as back, neck or hands/wrist pain and eye fatigue (Leung et al., 2024).

Implications for Māori

The NZGS identified that the average number of gambling activities engaged in by Māori was similar to that of Pākehā and Pacific peoples (Health NZ and Kupe, 2025). This was not seen in our study, which found that when gambling online, Māori were more likely to engage in a greater number of activities, gamble more frequently, spend more on gambling and have longer online gambling sessions. The discrepancy in findings could be because the NZGS assessed average number of activities across all gambling activities including land-based and online. *Our study, with a focus on online gambling, indicates that findings can be different when gambling access modes are investigated separately; this is an important consideration in efforts to reduce gambling harm inequitably experienced by different population groups.*

Our study also found that Māori were more likely to engage in online gambling for real and virtual (play) money and for longer sessions than non-Māori. An exploratory review investigating the relationship between virtual money gambling and real money gambling identified that virtual money gambling is "likely to encourage and promote monetary gambling"

(Armstrong et al., 2018). *Together with the findings from our study, this identifies an area for public health education and intervention given that virtual money gambling was popular amongst Māori participants alongside online gambling for real money on a higher number of activities*; the latter being associated with development of risky gambling behaviours, as previously discussed.

Similarly, Māori had longer F2P gaming sessions than non-Māori, although the frequency of spending money on microtransactions and purchasing loot boxes was similar between the populations. This implies that, for Māori, there could be increased risk of harm from online gambling but for F2P gaming, the risk of harm is likely to be similar to that for non-Māori.

How engagement relates to F2P gaming and gambling harm

Gambling and F2P gaming risk level and harm

The data from our study indicates that the prevalence of risky gambling behaviours is high, particularly for mixed gambler-F2P gamers. Similarly, the prevalence of risky F2P gaming in our study was high, with 59% of F2P gamers and 74% of mixed gambler-F2P gamers being classified at this level of risk. Again, it is important to note the higher prevalence for mixed gambler-F2P gamers.

As Lotto is a non-continuous activity generally associated with lower gambling risk levels, analyses removing participants who only gambled on Lotto were also conducted. Higher percentages of gambling risk levels amongst gamblers and mixed gambler-F2P gamers were found when Lotto-only gamblers were removed, compared with when Lotto-only participants were included. This finding confirms that Lotto-only participants have lower risk compared with other gamblers.

Mirroring the risky gambling findings, mixed gambler-F2P gamers experienced more gambling and gaming harm than online gamblers or F2P gamers, with higher proportions of the former reporting multiple harms. Predictably, reduction in available spending money was the most often reported harm. Again, when Lotto-only gamblers were removed from analyses, the number of harms declined (since a large group was excluded), but the percentage of remaining participants in each of the groups who cited fewer harms increased, indicating the higher harm rates among non-Lotto only gamblers.

Gambling harm was measured via the Short Gambling Harm Screen. Additional to that screen, participants were asked about negative consequences of gambling; in other words, another way of asking about harms. Again, financial issues were the most often reported but a range of negative effects was identified including mental health and physical health issues; sleep issues; detriments to relationships; detriments to daily living such as daily tasks, hobbies and lifestyle habits; reduced living conditions, and detriments to employment or education. These covered the range of harms previously identified by Langham et al. (2016) and subsequently in New Zealand gambling harms research (Browne et al., 2017; Rockloff et al., 2021). Again, higher proportions of mixed gambler-F2P gamers endorsed each negative consequence (apart from financial effects) compared with online gamblers.

Mixed gambler-F2P gamers were slightly more likely than online gamblers to report that negative effects were mainly due to online gambling, with much smaller proportions of both groups identifying land-based gambling as the main cause of negative effects. It is of note that online Lotto was the most common reported activity causing gambling harm for both gamblers and mixed gambler-F2P gamers and, even when Lotto-only gamblers were removed from the

analysis, online Lotto remained the most common reported activity causing harm amongst gamblers, though online gaming machines became the most reported harmful activity amongst mixed gambler-F2P gamers. Taken together, *these findings indicate that online gambling is inherently more harmful than land-based gambling, possibly due to the constant availability and accessibility as well as ease of making transactions (bets).*

Influencing factors

Whilst most online gamblers and mixed gambler-F2P gamers had not tried to reduce or quit gambling, of those who had, 30.8% of gamblers and 54% of mixed gambler-F2P gamers resumed gambling when they received inducements (e.g. bonus bets) from a gambling provider or in response to general advertisements from gambling providers including in newsletters and emails. This demonstrates the powerful nature of incentives and advertising in encouraging gambling behaviours. Hing et al. (2017) in a review of available literature, identified that sports and race betting inducements and advertisements could lead to heightened gambling risk necessitating increased consumer protection and harm reduction approaches. A more recent randomised controlled trial of French online gamblers identified that inducements increased gambling expenditure and perceived loss of control, particularly for risky gamblers (Challet-Bouju et al., 2020). The authors suggested that whilst more research is required, *the regulation of gambling inducements could be useful for harm minimisation and early intervention. This is something that could also be considered in New Zealand.*

Implications for Māori

Over the past two decades or longer, Māori (along with Pacific people) have been disproportionately represented amongst adults with risky gambling behaviours; this finding was again noted in the latest NZGS with 4.9% of Māori adults classified as moderate risk/problem gamblers compared with 1.9% of Pākehā (Health NZ and Kupe, 2025). The higher risk for Māori was also identified in our study with Māori respondents having more than twice the risk for moderate risk/problem gambling and for experiencing gambling harm than non-Māori. However, there was no difference between Māori and non-Māori for F2P gaming risk or harm.

Opportunities for virtual (or play) money gambling influenced decisions to gamble online with real money, particularly for mixed gambler-F2P gamers. As previously mentioned, our study identified that Māori were twice as likely to engage in virtual gambling than non-Māori and for longer sessions, which might indicate higher risk for Māori. Most studies that have investigated the relationship between virtual gambling and real money gambling have focused on adolescents and have indicated ambiguous results. For example, Rockloff et al. (2020) found that participants of simulated (virtual money) gambling games were "likely to be influenced to gamble more on real-money forms of gambling", whilst a small longitudinal study of Danish adolescents found that simulated gambling could increase or decrease real money gambling (Kristiansen et al.; 2018). *More research is required on this subject, especially to understand if virtual gambling is associated with the higher gambling risk experienced by Māori.*

Risk factors for gambling and F2P gaming risk level and harm

<u>Gambling</u>

After accounting for interacting/confounding influences, ethnicity was found to be strongly associated both with being a moderate risk/problem gambler and with gambling harm. Being of Asian ethnicity was associated with higher risk of being a moderate risk/problem gambler

and experiencing any gambling harm, compared with European/Other ethnicity. This finding requires further research to understand, especially as population level studies such as NZGS and, earlier, the NZ National Gambling Study (NGS) did not find heightened risk for Asian participants (Abbott et al., 2014; Health NZ and Kupe, 2025). However, those studies focused on the general population and all gambling, whilst the current study focused on adults who gambled online, and/or played F2P games and spent money on microtransactions. Being of Māori ethnicity was found to be associated with an increased risk of gambling harm, when compared with European/Other ethnicity, but had a similar risk for moderate risk/problem gambling as participants of European/Other ethnicity. Again, further research is required to fully understand this relationship and the influence of other factors that were not assessed in this study, such as gambling advertising and inducements that might have been targeted to Māori or Asian people. An example from New Zealand media is the promotion of overseas online casino companies by Māori social media influencers (Te Ao Māori News, 2024). *Other influencing factors that were not asked about in our survey, but which should be investigated in future research, include social isolation and/or social cohesion.*

Two other demographic factors were identified as being strongly associated with *lower* gambling risk level and gambling harm. These were older age and higher annual personal income. Participants aged 35 years and older were less likely to be moderate risk/problem gamblers, whilst participants aged 25 years and older were less likely to experience gambling harm, compared with younger adults. This somewhat aligns with the early NGS that identified being aged 45 years and older was associated with lower gambling risk (Abbott et al., 2014). Older age in the current study could be protective because fewer older adults tend to be regularly active online and gamble online compared with younger adults, although the NZGS only noted this finding for adults aged 65 years and older (Health NZ and Kupe, 2025). Earning $50,001 or more per year was associated with lower likelihood of moderate risk/problem gambling and harm compared with earning $20,000 or less. This could be related to having more disposable income, meaning that money spent gambling is recreational money that is not required for basic living. Several studies have identified that risky or problematic gambling is associated with low income (see Hahmann et al., 2021 for a recent scoping review), and an annual personal income of $20,000 or less is substantially lower than the median annual personal income of $41,500 identified in the 2023 Census (Stats NZ, Aotearoa Data Explorer, n.d.).

Two more demographic factors were found to be weakly associated with gambling harm but not with moderate risk/problem gambling. Females had a lower risk of harm than males whilst participants who were employed had an increased risk. Being a mixed gambler-F2P gamer was also weakly associated with increased risk of moderate risk/problem gambling and gambling harm. Given the weak nature of these associations, these findings should be considered cautiously and require replication research to confirm.

Increases in gambling behaviours were associated both with moderate risk/problem gambling and gambling harm. These included gambling on a higher number of land-based activities, and increased frequency of online gambling for real or virtual money. Whilst it is not unexpected that more gambling is associated with higher risk, as more gambling involves spending more money, it is somewhat surprising that increased frequency of virtual money gambling should be strongly associated with increased risk of being a moderate risk/problem gambler and increased risk of experiencing any gambling harm. As discussed earlier in this chapter, *more research is required to fully understand the relationship of virtual money gambling to real money gambling and whether there is a 'gateway' effect*. It is also possible that some participants with risky gambling behaviours used virtual gambling as a proxy for gambling as a method to try to reduce gambling expenditure (Wohl et al., 2017); these people might

previously have been moderate risk/problem gamblers, and identified as such in our study, as the PGSI measures gambling risk level in a past 12-month time frame.

F2P gaming

After accounting for interacting/confounding influences, no demographic factors were associated with moderate risk/problem gaming risk or gaming harm. However, regular (weekly or daily) purchasing of loot boxes was strongly associated with both moderate risk/problem gaming and harm. Long session lengths were also associated with moderate risk/problem gaming (sessions of one hour or longer) and with gaming harm (sessions of two hours or longer). Spending between $5 and $9.99 per microtransaction was weakly associated with moderate risk/problem gaming. The implications of these findings are compounded when considering prior research that identified increased expenditure on loot boxes is associated with problem gambling (Coelho et al., 2022; Drummond et al., 2020b; Garea et al., 2021). Although Delfabbro and King (2020) asserted that the direction, or causality, of this association was unknown and required longitudinal research, subsequent studies indicated that loot box purchasing appeared to result in increased migration to gambling (Brooks & Clark, 2023; González-Cabrera et al., 2023; Palmer et al., 2025). *This has implications for policy and regulation of loot boxes as a structural gaming feature with potential for association with future gambling harm, especially given that children and adolescents are attracted to gaming and are being normalised to loot boxes through their F2P gaming and other microtransaction opportunities.*

Strengths and limitations

A strength of this study was that it was the first of its kind in New Zealand to survey a substantial sample of the adult population (more than 4,000 people) to investigate online gambling and F2P gaming convergence, paying particular attention to sociodemographic and behavioural characteristics, as well as associated risk and harms. This has substantially increased our knowledge, which can inform future legislative, public health and intervention approaches to reducing online gambling and F2P gaming harm. It should be noted, however, that this study focused on financial harms from F2P gaming and did not consider harms from spending too much time gaming. Although online surveys have limitations, particularly in reaching older adults who are less likely to regularly use the internet, to explore convergence of F2P gaming and online gambling required gathering information about motivations, habits, and sociocultural and health related information from people who engage in those behaviours. Population-wide sampling was likely to have produced sample sizes that were too small for meaningful analyses to be carried out, making a targeted online survey the most pragmatic approach.

The 2023 Census identified that the New Zealand population comprised 17.8% Māori, 8.9% Pacific people and 17.3% Asian people, with the remainder being of European/Other ethnicity. Our study comprised 16.8% Māori, 1.8% Pacific people and 14.5% Asian people, meaning that there was a substantial under-representation of Pacific people, and a slight under-representation of Asian people. This is a limitation of our study, particularly for Pacific people, as findings may not be representative of the online gambling-F2P gaming Pacific population. The Government document "Digital inclusion user insights - Pacific people" (digital.govt.nz, n.d.) identified that cost of devices was a substantial barrier to Pacific people's digital inclusion. The document also detailed Pacific people's inequitable access to fast and stable connectivity, which could preclude participation in some online activities that require high speed and reliable internet access, such as F2P gaming. Future research should consider alternative approaches to gather data on this topic to fully understand the situation for Pacific people. As previously

mentioned in this chapter, Pacific people, along with Māori, are disproportionately affected by gambling harms, so the under-representation of Pacific people in our study means that insights may have been missed from this population.

Furthermore, as the survey was conducted only in English due to budgetary constraints, this may have precluded participation by Pacific and Asian adults who were less confident or proficient in reading the English language, particularly older adults. This may have skewed participants to younger age groups. Appendix 3, Table C details demographic variables by ethnicity. This shows that 12.3% of Asian participants were aged 55 years and older compared with 45.7% of European/Other participants, whilst the proportion of Asian participants aged 18 to 34 years was 31.1% compared with 13.4% of European/Other participants. A similar pattern was noted for Pacific participants (17.3% aged 55+ years, 19.7% aged 18-34 years) and, to a slightly lesser extent, for Māori participants (both age ranges at 26.4%). Future surveys on this topic should consider translation into te reo Māori and commonly used Pacific and Asian languages to encourage participation by older adults in these population groups. Furthermore, Māori participants differed from other participants in that 61.2% were female compared with between 22.4% and 44.1% for the other ethnicities. This gender skew may have influenced some of the Māori specific findings.

Another limitation of our study was that it focused on generic 'microtransactions' in F2P games and, specifically, loot boxes. Loot boxes or crates are known by alternative terms in some F2P games (e.g. "supply drops" in *Call of Duty*, "Hextech chests" in *League of Legends*). It is possible that some participants who play those games may not have equated the survey term 'loot box' with the equivalent terminology in the games they play and may, therefore, have incorrectly answered the questions. However, to mitigate this possibility the following description of a loot box was provided in the survey "virtual boxes that contain virtual items to gain benefits in the game but where you do not know in advance which items you will receive". Additionally, whilst our study asked questions about gambling-like elements in F2P gaming, virtual gaming machine rooms in videogames were not asked about. Neither were 'battle passes' asked about. These are rewards (e.g. experience points or in-game items) for completing tasks to unlock tiers and progress in the game, designed to keep players gaming by making the passes limited time only, and with a premium system requiring payment (i.e. microtransactions) that offers more exclusive or valuable items. These important features of F2P gaming should be included in future research on this topic.

The harm screen used to measure F2P gaming harm in this study was adapted from the Short Gambling Harm Screen (SGHS). This adaptation was created for this study and has not been validated, meaning that its reliability as a gaming harm measure is unknown. There has been some criticism of the SGHS for being too crude, with a call for development of a screen that measures types of harm and the severity of those types of harm (Delfabbro & King, 2024).

Finally, it is important to note that the findings presented in this report are correlational, and causality (the direction of the finding) cannot be inferred. In other words, the findings show where there are associations between the factors or variables, but they do not demonstrate a cause-and-effect relationship.

6.1 Conclusion

In this study of adults who gambled online and/or participated in F2P gaming and spent money on microtransactions, a much higher proportion of participants reported online gambling than F2P gaming where money was spent on microtransactions. This initially suggests that online

gambling should remain a priority in efforts to reduce gambling harm. However, people who engaged in both online gambling and F2P gaming and spent money on microtransactions (mixed gambler-F2P gamers) appeared to exhibit both gambling and gaming behaviours that increased risk of being a moderate risk/problem gambler/gamer, and this increased the risk of experiencing harms from both online gambling and F2P gaming, compared to people who only gambled or who only played F2P games. Twenty-eight percent of the 4,180 participants were mixed gambler-F2P gamers. This is one of the most important findings from this study as harm minimisation efforts, including interventions and public health initiatives have traditionally focused only on people who experience problems with their own or someone else's gambling. Despite the increasing convergence between gambling and F2P gaming, major harm minimisation efforts have not included F2P gaming. This study has identified that harm minimisation and prevention efforts should be targeted not only to people who gamble but also focus on those gamblers who participate in F2P gaming and spend money in those games on generic microtransactions and, more specifically, on loot boxes given their potential relationship with a migration to gambling behaviours. Furthermore, additional focus must remain on Māori, Pacific and Asian populations as well as younger adults who are disproportionately affected by F2P gaming harms as well as gambling harms.

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Note: * denotes references that were identified in the literature review chapter.

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APPENDIX 1: EMAIL INVITATION TO PARTICIPATE IN THE STUDY

HorizonPoll
LISTENING TO NEW ZEALAND
HORIZONPOLL - INCORPORATING SHAPENZ

Your experiences with online gambling and online free-to-play games...

Kia ora / Hi [salutation]!

Are you gambling online OR playing free-to-play online video games that offer the possibility of in-game payments to progress in the game?

This survey is being conducted for the AUT Gambling and Addictions Research Centre.

We'd like your help to understand

- **Who's gambling and/or gaming online in New Zealand**, how often - and
- **How much you're using free-to-play games online**, and spending while gaming, if anything..

We look forward to hearing about your experiences.

This survey will take 6 to 10 minutes. To say thanks for your contribution, you're in our **special September 30 $500 cash prize draw!**

Please enjoy the survey

Approved by the Auckland University of Technology Ethics Committee on <date final ethics approval was granted>, AUTEC Reference number <allocated reference number>.

Ngā mihi/ Kindest regards

Julia Ord
Manager
Horizon Research

My Account | Opt Out

APPENDIX 2: SURVEY QUESTIONNAIRE

Demographics questions

In which of these local authority areas are you currently living?

A. Ashburton District
B. Auckland Council
C. Buller District
D. Carterton District
E. Central Hawke's Bay District
F. Central Otago District
G. Chatham Islands Territory
H. Christchurch City
I. Clutha District
J. Dunedin City
K. Far North District
L. Gisborne District
M. Gore District
N. Grey District
O. Hamilton City
P. Hastings District
Q. Hauraki District
R. Horowhenua District
S. Hurunui District
T. Hutt City
U. Invercargill City
V. Kaikoura District
W. Kaipara District
X. Kapiti Coast District
Y. Kawerau District
YA. Mackenzie District
YB. Manawatu District
YC. Marlborough District
YD. Masterton District
YE. Matamata-Piako District
YF. Napier City
YG. Nelson City
YH. New Plymouth District
YI. Opotiki District
YJ. Otorohanga District
YK. Palmerston North City
YL. Porirua City
YM. Queenstown-Lakes District
YN. Rangitikei District
YO. Rotorua District
YP. Ruapehu District
YQ. Selwyn District
YR. South Taranaki District
YS. South Waikato District
YT. South Wairarapa District
YU. Southland District
YV. Stratford District
YW. Tararua District
YX. Tasman District

YY. Taupo District
YZ. Tauranga City
Z. Thames-Coromandel District
ZA. Timaru District
ZB. Upper Hutt City
ZC. Waikato District
ZD. Waimakariri District
ZE. Waimate District
ZF. Waipa District
ZG. Wairoa District
ZH. Waitaki District
ZI. Waitomo District
ZJ. Wellington City
ZK. Western Bay of Plenty District
ZL. Westland District
ZM. Whakatane District
ZN. Whanganui District
ZO. Whangarei District
ZP. New Zealander living overseas

Which of these age groups are you in?
A. Under 18 years
B. 18-24 years
C. 25-34 years
D. 35-44 years
E. 45-54 years
F. 55-64 years
G. 65-74 years
H. 75 years or over

Are you...
A. Male
B. Female
C. Another gender

Are you currently in paid employment?
A. Yes
B. No

Which of these best describes your personal income?
A. Less than $20,000 per year
B. Between $20,001 and $30,000 per year
C. Between $30,001 and $50,000 per year
D. Between $50,001 and $70,000 per year
E. Between $70,001 and $100,000 per year
F. Between $100,001 and $150,000 per year
G. Between $150,001 and $200,000 per year
H. More than $200,000 per year
I. Don't know/ prefer not to say

Which of these best describes your highest educational qualification?
A. Postgraduate degree (Masters' degree or PhD)
B. Undergraduate (Bachelor) degree
C. Vocational qualification (includes trade certificates, diplomas etc)
D. University Bursary or 7th form
E. Sixth form/UE/NCEA Level 2
F. NCEA Level 1 or School Certificate
G. No formal school qualification
H. Prefer not to say

Which of these ethnic groups do you primarily identify with?
A. Asian
B. Indian
C. Māori
D. Middle Eastern/Arabic
E. NZ European/Pākehā
F. Other European (includes Australian, South African, British etc)
G. Pasifika
H. Other (please tell us what that is)

SCREENER QUESTIONS FOR ELIGIBILITY

*Answer Yes to the online gambling screener **AND/OR** Yes to F2P question = eligible to participate*

This survey is about **ONLINE gambling** habits, that is, gambling **via a website or computer application, smartphone, or tablet**. In other words, this is gambling where **YOU ARE BETTING MONEY** and where you can then win or lose money.

It's also about free video game (commonly called **free-to-play or F2P game**) habits and practices.

In the past 12 months have you bet ONLINE on ANY of the following: Lotto, scratch cards, TAB sports or track (horse/dog) betting, housie/bingo, card game, pokie/slot machines, casino games, or Esports?
1. Yes
2. No

Free-to-play or F2P games are available free of charge and offer the possibility of in-game payments (**microtransactions**), for example to progress in the game or to enhance your gaming experience. They can be available via a website or app, on a computer, game console, mobile device or tablet, or on social media.

Some examples of F2P games are **Candy Crush, Angry Birds, Subway Surfers, Gardenscapes, Homescapes, Township, League of Legends, Fortnite**, **Farmville, Dungeon Keeper**, and **Pokémon Go**.

In the past 12 months, have you played any **F2P games** that offer the possibility of paying to progress in the game?

1. Yes
2. No

And have you ever made an in-game payment?

1. Yes
2. No

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1. REAL MONEY Gambling practices

First, we would like to ask you some questions about your gambling habits. This concerns gambling activities for which you bet real money.

From the list of gambling activities below, on which one(s) have you **gambled for money <u>ONLINE</u> over the past 12 months, if any**? Please tick all that apply.

Multiple responses allowed except code 10 exclusive

1. Lotto ONLINE (including Powerball and Strike) through MyLotto
2. Scratch cards (Instant Kiwi) ONLINE through MyLotto
3. TAB sports betting ONLINE or via NZ TAB mobile app
4. TAB track (horse/dog race) betting ONLINE or via NZ TAB mobile app
5. Housie or bingo ONLINE
6. Card game (e.g. poker) ONLINE
7. Pokie machines (also known as slot machines) ONLINE
8. Other ONLINE casino games (e.g. Blackjack, Roulette, Baccarat)
9. E-sports betting or virtual sports betting ONLINE
10. I have not gambled for money ONLINE over the last 12 months

If response is 10, skip to Q5.

2. Frequency of Online Gambling activities

On average, **how often** have you **gambled ONLINE for any of the activities in the past 12 months**?

Exclusive

1. Every day
2. Several times per week
3. Once a week
4. Two or three times a month
5. Once a month
6. Less than once a month

3. Expenditure on Online Gambling activities

In the past 12 months, in an **average month**, how much money did you usually spend gambling **ONLINE**?

Exclusive

1. $5 or less
2. $6 to $10
3. $11 - $20
4. $21 - $50
5. $51 - $75
6. $76 to $100
7. $101 to $199
8. $200 or more
9. I am not sure

4. Time spent on Online Gambling activities

In the past 12 months, how long did you typically spend in an online gambling session?

Exclusive

1. Less than 15 minutes
2. 15 to 30 minutes
3. 30 minutes to 1 hour
4. 1 to 2 hours
5. 2 to 3 hours
6. 3 to 6 hours
7. 6 to 9 hours
8. 10 hours or more
9. I am not sure

5. Offline (Land based) gambling behaviors

From the list of gambling activities below, on which one(s) have you gambled for money **OFFLINE** by **physically going to a venue** or point of sale **in the past 12 months**? Tick all that apply.

Multiple responses allowed except code 10 exclusive

1. Lotto (including Powerball and Strike) from a store
2. Scratch cards (Instant Kiwi) from a store
3. TAB sports betting at a NZ TAB or TAB at a sporting event
4. TAB track (horse/dog race) at a NZ TAB or TAB at a track event
5. Card game (e.g. poker)
6. Housie or bingo
7. Keno
8. At one of the 5 casinos in NZ (table games or pokie machines)
9. Pokie machines (gaming machines) at a pub, club, TAB or restaurant
10. I have not gambled for money offline (at a physical venue) over the last 12 months

If response to Q1 is 1 to 9 but to Q5 is 10, skip to Q7.
If response to Q1 is 10 and to Q5 is 10, skip to Q15.

6. Offline (Land based) vs. online gambling behaviors
In the past 12 months, would you say you have gambled:

Exclusive

1. More ONLINE than OFFLINE
2. More OFFLINE than ONLINE
3. About the same ONLINE and OFFLINE

7. Perceptions and MONEY gambling problems (ONLINE OR OFFLINE)
Would you say that **in the past 12 months**, gambling (**ONLINE or OFFLINE**) has had a **negative impact** in the following areas of your life (Tick the areas where there has been a negative impact). Tick all that apply.

Multiple responses allowed

1. My relationship with my partner
2. My relationships with my family members
3. My relationships with those around me (for example, friends, co-workers)
4. My finances
5. My job/studies
6. My mental health
7. My physical health
8. My sleep habits
9. My living conditions (for example, ability to afford housing, food)
10. My daily tasks
11. My lifestyle habits (for example, personal hygiene, diet, physical activities)
12. My hobbies
13. It has not had a negative impact

8. Problem Gambling Severity index (PGSI)
Thinking about your gambling activities (**ONLINE or OFFLINE**) in **the past 12 months**.
To what extent do the following questions apply to you?

	Never	Sometimes	Most of the time	Almost always
1.Have you bet more than you could really afford to lose?				
2.Have you needed to gamble with larger amounts of money to get the same feeling of excitement?				
3.When you gambled, did you go back another day to try to win back the money you lost?				
4.Have you borrowed money or sold anything to get money to gamble?				
5.Have you felt that you might have a problem with gambling?				
6.Has your gambling caused you any health problems, including stress or anxiety?				
7.Have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?				
8.Has your gambling caused any financial problems for you or your household?				
9.Have you felt guilty about the way you gamble or what happens when you gamble?				

9. Short Gambling Harm Screen

These next questions are about how gambling can affect people in a negative way. **In the last 12 months**, have you experienced any of the following issues **as a result of your gambling (ONLINE or OFFLINE).** Please tick all that apply.

Multiple responses allowed

1. Reduction of your available spending money
2. Reduction of your savings
3. Less spending on recreational expenses such as eating out, going to movies or other entertainment
4. Had regrets that made you feel sorry about your gambling
5. Felt ashamed of your gambling
6. Sold personal items
7. Increased credit card debt
8. Spent less time with people you care about
9. Felt distressed about your gambling
10. Felt like a failure

10. Online-Offline negative effects

Would you say, the **negative effects (ONLINE or OFFLINE)** are associated with?

Exclusive

1. Mainly with gambling ONLINE
2. Mainly with gambling OFFLINE
3. Evenly with gambling ONLINE and OFFLINE
4. I have not experienced any negative effects

11. Negative effects

Which **ONLINE** gambling activity has contributed **more** negative effects for you than other gambling activities?

Exclusive

1. Lotto ONLINE (including Powerball and Strike) through MyLotto
2. Scratch cards (Instant Kiwi) ONLINE through MyLotto
3. TAB sports betting ONLINE or via NZ TAB mobile app
4. TAB track (horse/dog race) betting ONLINE or via NZ TAB mobile app
5. Housie or bingo ONLINE
6. Card game (e.g. poker) ONLINE
7. Pokie machines (also known as gaming machines or slot machines) ONLINE
8. Other ONLINE casino games (e.g. Blackjack, Roulette, Baccarat)
9. E-sports betting or virtual sports betting ONLINE
10. I have not experienced any negative effects

12. Excessive consumption gambling

In the past 12 months, have you spent more **time** gambling **(ONLINE or OFFLINE)** than you had intended?

Exclusive

1. Yes on ONLINE gambling only
2. Yes on OFFLINE gambling only
3. Yes on both ONLINE and OFFLINE gambling
4. No

13. Exit gambling

In the past 12 months, have you tried to **reduce or quit** your participation in gambling **(ONLINE or OFFLINE)**?

Exclusive

1. Yes, I tried, and I could quit or pause these activities
2. Yes, I tried, and I could reduce these activities
3. Yes, I tried but I was not successful
4. No, I did not try

If Response is 1 go to Q14. If Response is 2, 3 or 4 go to Q15.

14. New entry gambling

In the past 12 months, did you start gambling (ONLINE or OFFLINE) **AGAIN** due to incentives from a provider or other promotions?

Exclusive

1. Yes, due to a direct incentive from a provider (e.g. a bonus)
2. Yes, due to general advertisements by providers (e.g. by newsletters, or emails)
3. No

15. Play Money Gambling

Now we are talking about **play money** gambling. In play money gambling the activities are identical to real money gambling, but no real money is wagered. For example, some sites can give you access to virtual money to gamble.

From the list of activities below, on which one(s) have you **gambled for play money ONLINE in the past 12 months**? Please tick all that apply.

Multiple responses allowed except code 10 exclusive

1. Lotto ONLINE
2. Scratch cards ONLINE
3. Sports betting ONLINE
4. Track (horse/dog race) betting ONLINE
5. Housie or bingo ONLINE
6. Card game (e.g. poker) ONLINE
7. Pokie machines (also known as gaming machines or slot machines) ONLINE
8. Other ONLINE casino games (e.g. Blackjack, Roulette, Baccarat)
9. E-sports betting or virtual sports betting ONLINE
10. I have not gambled for play money ONLINE over the last 12 months

If response is 10, skip to Q20.

16. Frequency of Play Money Gambling Online

On average, how often have you gambled **ONLINE for PLAY MONEY in the past 12 months**?

Exclusive

1. Every day
2. Several times per week
3. Once a week
4. Two or three times a month
5. Once a month
6. Less than once a month

17. Time spent on Play Money Gambling Online

On average, **in the past 12** months how much time did you usually **spend on a play money gambling session ONLINE**?

Exclusive

1. Less than 15 minutes
2. 15 to 30 minutes
3. 30 minutes to 1 hour
4. 1 to 2 hours
5. 2 to 3 hours
6. 3 to 6 hours
7. 6 to 9 hours
8. 10 hours or more
9. I am not sure

18. Free games – microtransactions

In the past 12 months, did you ever conduct **microtransactions** (i.e. spend real money) in these free games (e.g. to buy additional chips)?

Exclusive

1. Yes, often
2. Yes, occasionally
3. No

19. Led to gamble for real money

How closely would you say that play money gambling has led you to gamble for real money?

Exclusive

1. Not at all

A little

Quite a bit

Certainly

20. F2P gaming

Now, we are going to ask you some questions about your habits and practices of **online F2P (free to play) video games** via a site or an application, on a computer, mobile, tablet, console or on social networks, **in which it is possible to pay to advance in the game** (e.g. CandyCrush, Farmville, Dungeon Keeper).

In the past 12 months, have you played **ONLINE F2P** games on a computer, tablet, console or smart phone via websites, apps or on social networks?

Exclusive

1. Yes

No

IF RESPONSE IS 2, SKIP TO Q33

21. Gaming time

In the past 12 months, how much time did you usually spend each time you **played F2P games**?

Exclusive

1. Less than 15 minutes
2. 15 to 30 minutes
3. 30 minutes to 1 hour
4. 1 to 2 hours
5. 2 to 3 hours
6. 3 to 6 hours
7. 6 to 9 hours
8. 10 hours or more
9. I am not sure

22. Spent money in F2P games

In the past 12 months, have you made any **microtransactions** (i.e. paid money) in any F2P games?

Exclusive

1. Yes
2. No

IF RESPONSE IS 2, SKIP TO Q33

23. Main Reason for payment in F2P games

In the past 12 months, why have you made **microtransactions** (i.e. paid money) in F2P games? Tick all that apply.

Multiple responses allowed

1. To increase my chances of winning
2. To get more time in the game
3. To be able to continue playing
4. To get the most out of the game
5. To take advantage of special offers
6. For aesthetic reasons (e.g. for better looking avatars)
7. To support a gaming community
8. To encourage gaming companies
9. To invest in a pastime
10. To avoid advertising
11. Other reasons; specify /……../
12. I don't know

24. Frequency of F2P gaming

In the past 12 months, how **often** have you **played F2P games** where you could make microtransactions (i.e. pay money)?

Exclusive

1. Every day
2. Several times per week
3. Once a week
4. Two or three times a month
5. Once a month
6. Less than once a month
7. I am not sure

25. Frequency of payment

In the past 12 months, how often have you made **microtransactions** (i.e. paid money) while playing F2P games?

Exclusive

1. Every day
2. Several times per week
3. Once a week
4. Two or three times a month
5. Once a month
6. Less than once a month
7. I am not sure

26. Typical amount spent

In the past 12 months, how much money have you typically spent on **a SINGLE transaction during a F2P game**? Roughly…

Exclusive

8. $1 to $2.99
9. $3 to $4.99
10. $5 to $7.99
11. $8 to $9.99
12. $10 or more
13. I don't know

27. Payment for lootboxes

In the past 12 months, have you **spent money on loot boxes or crates** (virtual boxes that contain virtual items to gain benefits in the game but where you do not know in advance which items you will receive)?

Exclusive

1. Yes
2. No

If response is 2, skip to Q30

28. Frequency of payment - loot boxes

In the past 12 months, how many times have you spent money on loot boxes or crates?

Exclusive

1. Every day
2. Several times per week
3. Once a week
4. Two or three times a month
5. Once a month
6. Less than once a month
7. I am not sure

29. Typical amount spent - loot boxes

In the past 12 months, what is the typical amount of real money you spent on loot boxes or crates in a **single transaction**?

Exclusive

1. $1 to $2.99
2. $3 to $4.99
3. $5 to $7.99
4. $8 to $9.99
5. $10 or more
6. I don't know

30. Gaming and real money gambling link

In the past 12 months, how closely would you say that spending money on F2P games has **led you to participate** in **GAMBLING** with money?

Exclusive

1. Not at all
2. A little
3. Quite a bit
4. Certainly

31. PGSI-F2P

Thinking about **only F2P games you spent money on** in the **past 12 months**. To what extent do the following questions apply to you?

	Never	Sometimes	Most of the time	Almost always
1. Have you spent more money than you could really afford to lose?				
2. Have you spent more time than you intended?				
3. Have you needed to play longer to get the same feeling of excitement?				
4. When you played and lost, did you increase your playing time to regain your initial position?				
5. Have you borrowed money or sold anything to get money to make microtransaction in a F2P game?				
6. Have you felt that you might have a problem with making microtransactions in F2P gaming?				
7. Has spending money in your F2P gaming caused you any health problems, including stress or anxiety?				
8. Have people criticized your F2P gaming or told you that you had a gaming problem, regardless of whether or not you thought it was true?				
9. Has your F2P gaming caused any financial problems for you or your household?				
10. Have you felt guilty about the way you game on a F2P or what happens when you play?				

32. SGHS-F2P

The next questions are about how microtransaction (i.e. spending money) during F2P gaming can affect people in a negative way. **In the last 12 months**, have you experienced any of the following issues because of these sorts of payments in your F2P gaming. Please tick all that apply.

Multiple responses allowed

1. Reduction of your available spending money
2. Reduction of your savings
3. Less spending on recreational expenses such as eating out, going to movies or other entertainment
4. Had regrets that made you feel sorry about spending money in your F2P gaming
5. Felt ashamed of spending money in your F2P gaming
6. Sold personal items
7. Increased credit card debt
8. Spent less time with people you care about
9. Felt distressed about spending money in your F2P gaming
10. Felt like a failure
11. I have not experienced any of these issues

33. Access to online gaming and gambling

When you **gamble online or play F2P games online**, how do you access the games? Tick all that apply.

Multiple responses allowed.

1. My own mobile phone/smart phone
2. Shared mobile phone/smart phone
3. My own tablet
4. Shared tablet
5. My own laptop
6. Shared laptop
7. My own gaming console
8. Shared gaming console
9. Community device (e.g. at local library)
10. Other: Please specify……..

Thank you, this is the end of the survey.

APPENDIX 3: DEMOGRAPHICS FOR ONLINE GAMBLER, F2P GAMER AND MIXED GAMBLER-F2P GAMER GROUPS

Table A: Column percentages

Demographic variable	Online gambler			F2P gamer			Mixed gambler-F2P gamer			*Total*
	n	%	95% CI	n	%	95% CI	n	%	95% CI	*%*
Total	*2,770*			*223*			*1,187*			
Age (years)										
18 - 24	62	2.2	1.7, 2.8	19	8.5	4.9, 6.0	76	6.4	5.0, 7.8	*3.8*
25 - 34	294	10.6	9.5, 11.8	44	19.7	14.6, 25.0	274	23.1	20.7, 25.5	*14.5*
35 - 54	1,106	39.9	38.1, 41.8	109	48.9	42.3, 55.4	651	54.8	52.0, 57.7	*44.7*
55+	1,308	47.2	45.4, 49.2	51	22.9	17.3, 28.4	186	15.7	13.6, 17.7	*37.1*
Gender										
Male	1,537	55.5	53.8, 57.3	99	44.4	37.7, 50.7	666	56.1	53.3, 58.8	*54.1*
Female	1,229	44.4	42.5, 46.1	119	53.4	47.1, 59.2	514	43.3	40.7, 46.1	*45.5*
Other	4	0.1	0.0, 0.3	5	2.2	0.4, 4.5	7	0.6	0.2, 1.0	*0.4*
Ethnicity										
Māori	394	14.2	13.1, 15.3	40	17.9	13.0, 22.9	292	24.6	22.3, 27.2	*16.8*
Pacific	40	1.4	1.1, 1.8	3	1.3	0.0, 3.1	38	3.2	2.3, 4.2	*1.8*
Asian	339	12.2	11.2, 13.3	27	12.1	8.1, 16.6	242	20.4	18.1, 22.7	*14.5*
European/Other	1,997	72.1	70.5, 73.9	153	68.6	62.3, 74.4	615	51.8	48.9, 54.6	*66.8*
Area of residence										
Auckland	948	35.1	33.2, 36.8	64	29.1	23.6, 35.0	102	33.6	35.9, 42.0	*35.7*
Christchurch	209	7.7	6.8, 8.7	21	9.5	5.9, 14.1	18	5.9	7.5, 10.7	*8.1*
Wellington/Porirua/ Upper Hut/Hut City	254	9.4	8.4, 10.4	28	12.7	8.6, 16.8	39	12.8	9.4, 13.3	*10.4*
Rest of North Island	856	31.7	30.1, 33.5	73	33.2	27.3, 39.5	104	34.2	24.9, 30.3	*30.8*
Rest of South Island	435	16.1	14.8, 17.5	34	15.5	10.9, 20.5	41	13.5	11.0, 14.8	*15.0*
Missing	*68*			*3*			*12*			
Employment										
No	875	31.6	29.9, 33.3	61	27.4	21.1, 33.6	185	15.6	13.5, 17.7	*27.2*
Yes	1,895	68.4	66.6, 70.1	162	72.6	66.4, 78.9	1,002	84.4	82.3, 86.5	*72.8*
Annual personal income										
≤ $20,000	188	7.5	6.6, 8.4	30	15.2	10.6, 19.7	80	7.2	5.7, 8.6	*8.3*
$20,0001 - $50,000	745	29.8	28.1, 31.8	58	29.3	23.2, 35.9	258	23.2	21.0, 25.5	*28.0*
$50,0001 - $100,000	973	39.0	37, 40.8	67	33.8	27.3, 40.4	497	44.8	42.0, 47.6	*40.0*
> $100,000	591	23.7	22.1, 25.4	43	21.7	15.7, 27.8	275	24.8	22.3, 27.4	*23.7*
Missing	*273*			*25*			*77*			
Highest educational attainment										
No formal qual.	211	7.7	6.8, 8.7	11	5.0	2.3, 7.8	54	4.6	3.5, 5.8	*6.5*
School Certificate	727	26.5	25.0, 28.1	43	19.6	14.6, 24.7	283	24	21.7, 26.5	*25.0*
Vocational qual.	721	26.3	24.6, 28.0	67	30.6	24.2, 36.5	310	26.3	23.7, 28.8	*26.4*
University degree or higher	1,081	39.5	37.5, 41.4	98	44.7	38.8, 51.1	532	45.1	42.0, 48.0	*42.1*
Missing	*30*			*4*			*8*			

Table B: Row percentages

Demographic variable	Online gambler			F2P gamer			Mixed gambler-F2P gamer			*Total*
	n	**%**	**95% CI**	**n**	**%**	**95% CI**	**n**	**%**	**95% CI**	***n***
Total	*2,770*			*223*			*1,187*			*4,180*
Age (years)										
18 - 24	62	39.5	31.8, 47.1	19	12.1	7.0, 17.2	76	48.4	40.6, 56.2	*157*
25 - 34	294	48.0	44.1, 52.0	44	7.2	5.1, 9.2	274	44.8	40.8, 48.7	*612*
35 - 54	1,106	59.3	57.0, 61.5	109	5.8	4.8, 6.9	651	34.9	32.7, 37.0	*1,866*
55+	1,308	84.7	82.9, 86.5	51	3.3	2.4, 4.2	186	12.0	10.4, 13.7	*1,545*
Gender										
Male	1,537	66.8	64.8, 68.7	99	4.3	3.5, 5.1	666	28.9	27.1, 30.8	2,302
Female	1,229	66.0	63.9, 68.2	119	6.4	5.3, 7.5	514	27.6	25.6, 29.6	1,862
Other	4	25.0	3.8, 46.2	5	31.3	8.5, 54.0	7	43.8	19.4, 68.1	16
Ethnicity										
Māori	394	54.3	50.6, 57.9	40	5.5	3.8, 7.2	292	40.2	36.7, 43.8	726
Pacific	40	49.4	38.5, 60.3	3	3.7	-0.4, 7.8	38	46.9	36.0, 57.8	81
Asian	339	55.8	51.8, 59.7	27	4.4	2.8, 6.1	242	39.8	35.9, 43.7	608
European/Other	1,997	72.2	70.6, 73.9	153	5.5	4.7, 6.4	615	22.2	20.7, 23.8	2,765
Area of residence										
Auckland	948	64.4	62.0, 66.9	64	4.4	3.3, 5.4	102	31.2	28.8, 33.6	1,471
Christchurch	209	62.0	56.8, 67.2	21	6.2	3.7, 8.8	18	31.8	26.8, 36.7	337
Wellington/Porirua/ Upper Hut/Hut City	254	60.9	56.2, 65.6	28	6.7	4.3, 9.1	39	32.4	27.9, 36.9	417
Rest of North Island	856	68.3	65.7, 70.9	73	5.8	4.5, 7.1	104	25.9	23.4, 28.3	1,253
Rest of South Island	435	70.3	66.7, 73.9	34	5.5	3.7, 7.3	41	24.2	20.9, 27.6	619
Missing	*68*			*3*			*12*			*83*
Employment										
No	875	78.1	75.6, 80.5	61	5.4	4.1, 6.8	185	16.5	14.3, 18.7	1,121
Yes	1,895	61.9	60.2, 63.7	162	5.3	4.5, 6.1	1,002	32.8	31.1, 34.4	3,059
Annual personal income										
≤ $20,000	188	63.1	57.6, 68.6	30	10.1	6.7, 13.5	80	26.8	21.8, 31.9	298
$20,0001 - $50,000	745	70.2	67.5, 73.0	58	5.5	4.1, 6.8	258	24.3	21.7, 26.9	1,061
$50,0001 - $100,000	973	63.3	60.9, 65.7	67	4.4	3.3, 5.4	497	32.3	30.0, 34.7	1,537
> $100,000	591	65.0	61.9, 68.1	43	4.7	3.4, 6.1	275	30.3	27.3, 33.2	909
Missing	*273*			*25*			*77*			*375*
Highest educational attainment										
No formal qual.	211	76.4	71.4, 81.5	11	4.0	1.7, 6.3	54	19.6	14.9, 24.2	276
School Certificate	727	69.0	66.2, 71.8	43	4.1	2.9, 5.3	283	26.9	24.2, 29.6	1,053
Vocational qual.	721	65.7	62.9, 68.5	67	6.1	4.7, 7.5	310	28.2	25.6, 30.9	1,098
University degree or higher	1,081	63.2	60.9, 65.5	98	5.7	4.6, 6.8	532	31.1	28.9, 33.3	1,711
Missing	*30*			*4*			*8*			*42*

Table C: Demographics by ethnicity

Demographic variable	Māori			Pacific			Asian			European/Other		
	n	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI
Total	726			81			608			2,765		
Age (years)												
18 - 24	46	6.3	4.4, 8.0	4	4.9	1.3, 10.5	37	6.1	4.4, 8.3	70	2.5	22.1, 3.4
25 - 34	146	20.1	17.1, 23.6	12	14.8	6.0, 21.1	152	25.0	21.7, 29.2	302	10.9	9.7, 12.0
35 - 54	342	47.1	43.6, 51.7	51	63.0	52.6, 76.3	344	56.6	52.7, 60.9	1129	40.8	40.1, 44.2
55+	192	26.4	22.4, 29.8	14	17.3	7.9, 27.6	75	12.3	8.9, 14.6	1264	45.7	42.5, 46.6
Gender												
Male	279	38.4	35.4, 42.2	52	64.2	55.3, 75.6	436	71.7	68.9, 77.1	1535	55.5	54.5, 58.8
Female	444	61.2	57.5, 64.3	28	34.6	23.7, 43.4	170	28.0	22.4, 30.8	1220	44.1	40.7, 45.1
Other	3	0.4	0.0, 0.8	1	1.2	0.0, 3.9	2	0.3	0.0, 1.1	10	0.4	0.1, 0.6
Area of residence												
Auckland	209	29.7	25.6, 32.9	49	60.5	48.7, 71.1	398	65.6	62.0, 69.8	815	30.1	28.2, 32.1
Christchurch	66	9.4	7.2, 11.7	7	8.6	2.6, 14.5	35	5.8	3.9, 8.1	229	8.5	7.3, 9.6
Wellington/ Porirua/Upper Hut/Hut City	78	11.1	9.4, 14.1	6	7.4	2.6, 14.5	68	11.2	7.9, 13.3	265	9.8	8.5, 11.0
Rest of North Island	270	38.4	33.8, 41.3	17	21	13.2, 32.2	78	12.9	10.1, 15.8	888	32.8	30.9, 34.5
Rest of South Island	81	11.5	9.4, 14.5	2	2.5	0.0, 6.6	28	4.6	32., 6.9	508	18.8	17.4, 20.8
Missing	*22*			*0*			*1*			60		
Employment												
No	209	28.8	23.9, 31.0	15	18.5	10.5, 26.3	66	10.9	6.7, 11.5	831	30.1	26.6, 30.0
Yes	517	71.2	69.0, 76.1	66	81.5	73.7, 89.5	542	89.1	88.5, 93.3	1934	69.9	70.0, 73.4
Annual personal income												
≤ $20,000	75	11.0	8.8, 13.7	8	10.5	3.9, 17.1	36	6.6	4.5, 8.6	183	7.2	6.2, 8.2
$20,0001 - $50,000	231	33.9	29.5, 37.0	13	17.1	9.2, 26.3	75	13.8	10.6, 16.3	750	29.7	27.7, 31.2
$50,0001 - $100,000	266	39.1	35.9, 43.5	42	55.3	44.7, 65.8	283	52.0	47.6, 57.0	952	37.7	35.8, 39.6
> $100,000	109	16.0	12.7, 18.9	13	17.1	9.2, 26.3	150	27.6	24.0, 32.1	641	25.4	24.0, 27.4
Missing	*45*			*5*			*64*			239		
Highest educational attainment												
No formal qual.	73	10.2	7.7, 12.3	1	1.2	0.0, 4.6	5	0.8	0.0, 1.1	197	7.2	5.9, 7.9
School Cert.	225	31.4	27.5, 34.6	35	43.2	31.6, 52.6	69	11.5	8.5, 13.6	724	26.4	24.2, 27.7
Vocational qual.	221	30.9	27.7, 34.4	22	27.2	18.4, 38.2	69	11.5	8.9, 14.7	786	28.7	27.1, 30.7
University degree or higher	197	27.5	24.5, 31.4	23	28.4	18.4, 39.5	457	76.2	73.5, 80.2	1034	37.7	36.5, 40.0
Missing	*10*			*0*			*8*			24		

APPENDIX 4: NON-SIGNIFICANT PREDICTORS IN MULTIVARIABLE MODELS

Table A: Non-significant predictors for gambling risk level and harm: Multivariable analyses

	Gambling risk level					Gambling harm				
	No/LR median /%	MR/ Prob median /%	Odds Ratio (95% CI)	Risk ratio	p-value	No harm median/ %	Harm median /%	Odds Ratio (95% CI)	Risk ratio	p-value
Area of residence					0.42					0.33
Auckland	74.2	25.8				64.2	35.8			
Christchurch	78.2	21.8	0.65 (0.39, 1.14)	0.68		64.9	35.1	0.98 (0.60, 1.54)	0.99	
Wellington/ Porirua/Upper Hut/Hut City	81.0	19.0	0.80 (0.56, 1.15)	0.82		68.6	31.4	1.08 (0.77, 1.46)	1.06	
Rest of North Island	82.1	18.0	0.80 (0.51 1.30)	0.82		69.2	30.8	1.28 (0.85 1.50)	1.19	
Rest of South Island	77.6	22.4	1.08 (0.64, 1.80)	1.07		63.5	36.5	1.53 (0.90, 2.49)	1.34	
No. of gambling activities										
No. of *online* gambling activities	1.0	2.0	1.03 (0.90, 1.19)		0.84	1.0	2.0	1.03 (0.90, 1.20)		0.61
Monthly *online* gambling expenditure										
≤ $10 (reference)	86.5	13.5			0.06	73.8	26.2			0.13
$11 - $20	87.1	12.9	0.81 (0.48, 1.40)	0.83		73.1	26.9	1.17 (0.70, 1.80)	1.12	
$21 - $50	81.4	18.6	0.79 (0.50, 1.30)	0.81		68.8	31.2	1.06 (0.70, 1.60)	1.04	
$51 - $100	69.2	30.8	1.33 (0.80, 2.30)	1.27		57.2	42.8	1.62 (0.90, 2.60)	1.39	
> $100	59.3	40.7	1.28 (0.71, 2.31)	1.23		49.9	50.1	1.48 (0.80, 2.40)	1.31	

LR = low risk gambling, MR/Prob = moderate risk/problem gambling
95% CI = 95% Confidence Interval

Table B: Non-significant predictors for F2P gaming risk level and harm: Multivariable analyses

	F2P Gaming risk level					F2P Gaming harm				
	No/LR %	**MR/ Prob %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**	**No harm %**	**Harm %**	**Odds Ratio (95% CI)**	**Risk ratio**	**p-value**
Ethnicity					0.36					0.21
European/Other (reference)	65.8	34.2				56.12	43.88			
Māori	50.8	49.2	1.40 (0.60, 32.8)	1.23		45.60	54.40	1.21 (0.60, 2.50)	1.11	
Pacific	27.3	72.7	4.14 (0.60, 30.9)	2.00		36.36	63.64	3.67 (0.50, 23.80)	1.69	
Asian	39.0	61.0	1.67 (0.70, 3.70)	1.36		32.35	67.65	2.21 (0.90, 5.40)	1.44	
Age (years)					0.15					0.07
18 to 24 (reference)	37.5	62.5				41.7	58.3			
25 to 34	49.4	50.6	0.58 (0.20, 1.90)	0.79		38.4	61.6	1.64 (0.40, 5.60)	1.19	
35 to 54	57.7	42.3	0.33 (0.10, 1.10)	0.57		51.5	48.5	0.67 (0.20, 2.10)	0.81	
55+	69.8	30.2	0.38 (0.10, 1.60)	0.62		57.6	42.4	0.4 (0.10, 2.00)	0.62	
F2P gaming engagement					0.34					0.74
F2P gamer (reference)	72.9	27.1				61.24	38.8			
Mixed gambler-F2P gamer	53.2	46.8	0.58 (0.20, 1.70)	0.66		46.43	53.6	0.83 (0.20, 2.50)	0.89	

LR = low risk F2P gaming, MR/Prob = moderate risk/problem F2P gaming
95% CI = 95% Confidence Interval