Safer Gambling Messaging Project (Phase II)

An impact evaluation from the Behavioural Insights Team

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Executive summary

This report summarises the impact evaluation of the Safer Gambling Messaging Project, which was run in 2019–20 by Revealing Reality, commissioned by GambleAware. BIT has also conducted a process evaluation of the programme, which is documented separately and forms a counterpart to this report.

The aim of the Safer Gambling Messaging Project is to develop safer gambling[1] messaging in collaboration with gambling industry operators[2]. Seven operators originally participated in the programme, and five of them[3] proceeded to implement and test at least some of the interventions which they developed. Some interventions and evaluations were compromised due to the Covid-19 pandemic but we were still able to conduct much of the planned evaluation activity, at least online.

As the name of the programme suggests, most of the safer gambling interventions were communications programmes of various kinds including emails, banner advertisements (which appear in pre-defined regions of the screen alongside other content) and social media campaigns. Some operators also tested alterations to their sign-up procedures which made safer gambling tools more salient or otherwise directed users towards them.

These reports focus on the following research questions with respect to safer gambling messaging:

- *What are the implications or considerations for operators when planning and testing new approaches?*
- *What are the implications or considerations for the industry, trade bodies, and the regulator around further piloting or roll out?*
- *What do operators need to put in place to enable them to implement best practice?*
- *Are there specific implications of implementation in different gambling environments?*

The particular aim of this impact evaluation is to “assess the effectiveness and impact of the piloted interventions”. The four questions above are addressed more explicitly in the accompanying process evaluation.

BIT worked in partnership with the five operators to help them to implement impact evaluations alongside the interventions themselves. In practice, these were a mixture of randomised controlled trials and pre-post evaluations, depending on whether the operator

[1] “Safer gambling” in this context refers to industry initiatives to limit the risks of problem gambling and gambling-related harm (see for example the Safer Gambling Standard). Most operators will generally refer to “responsible gambling” (RG) rather than “safer gambling”. In this report we use GambleAware’s own recommendation and refer to safer gambling throughout.
[2] For further details, see https://about.gambleaware.org/research/research-projects/ under the heading “industry-based initiatives”
[3] These five operators were 888, Betfred, Buzz Bingo, Gamesys and Genting Casinos.

administered their interventions wholesale or to a selected group of customers.

We find that:

- Direct messaging interventions such as emails and SMS were generally ineffective in increasing the proportion of customers who made use of safer gambling tools such as deposit limits and session time reminders. Alternative forms of intervention such as social media campaigns and a revised sign-up process aimed at directly reducing friction and increasing salience of safer gambling tools did greatly increase take up of reality checks and deposit limits respectively;

- There were no effects of the interventions on bottom-line outcomes such as total amount deposited or total play time. This holds both as an overall estimate and when we specifically consider the group of people who changed their behaviour as a result of the interventions; and

- There is some evidence that safer gambling messaging, particularly on social media, can be useful as a marketing tool and as an effective way of engaging with customers and potential customers, aside from any safer gambling benefits. One operator found that their safer gambling material on Instagram and Facebook received more engagement on social media than any of their other recent content. Another operator observed a significant increase in the number of customers setting timed session reminders following a social media awareness campaign.

We make some specific recommendations as to how the programme can continue to generate useful evidence for what works in safer gambling messaging. In particular,

- The fact that some interventions significantly increase take up of safer gambling tools such as deposit limits allows us to evaluate the safer gambling tools *themselves*. This is a limited opportunity and one that we recommend the programme capitalises on, by explicitly including direct evaluation of the safer gambling tools as a programme goal.

- The programme should continue to incorporate evaluation components, particularly for those interventions intended for physical environments such as casinos and betting shops. Due to the pandemic, these have largely been untested in the current iteration.

- It is important that evaluations are conducted as randomised controlled trials where possible, to ensure *causal* evidence is generated. In this iteration of the programme, we have (of necessity) used pre-post evaluation techniques in some cases which have produced results which are not consistent with other, similar evaluations which use more robust methodologies. We appreciate that randomised controlled trials will not be possible in every case, but recommend that they should be the default. In particular, the fact that an intervention takes place in a physical space should not preclude the possibility of an RCT.

Overall, we consider that the safer gambling messaging programme has been effective at producing interventions that are likely to reduce gambling harms, and recommend that the

programme continues.

Introduction

Messaging has an important role to play in reducing gambling harm. Safer gambling messaging comprises, for example, advertisements that appear on television, or notifications that appear on-screen when logged into an online gambling platform. Recent evidence indicates that a generic warning label approach may not be effective[4], and consequently a more individualised, operator-led approach might have more impact. However, much of the evidence is from laboratory studies or experiments conducted away from the environments in which people would normally gamble and there are some questions about how well the evidence might generalise to a more natural setting. This impact evaluation aims to complement existing research by examining safer gambling messaging as implemented by gambling operators on their customers in live play.

In 2017, the Gambling Commission initiated the Safer Gambling Messaging Project with the objective of producing "best practice principles and some specific tested and evaluated ideas" with regard to operators messaging customers about safer gambling.

Part one of this project had the aim of testing the concept of a range of potential approaches, in order to identify and promulgate good practice. The report, produced by Revealing Reality[5], was published in late 2017.

Part two, which is the focus of this report, has two aims. Firstly, we evaluate messaging programmes which have been developed by gambling operators, according to the principles developed in part one. Revealing Reality initially worked with seven gambling operators (888, Betfred, Buzz Bingo, Gamesys, Genting Casinos, Praesepe and Victoria Gate) to develop messaging campaigns and related interventions with the aim of minimising gambling-related harms to their customers in line with the Betting and Gaming Council's safer gambling commitments[6]. Five of these operators (888, Betfred, Buzz Bingo, Gamesys and Genting Casinos) subsequently completed the programme and conducted evaluation activities.

Secondly, we perform a summative process evaluation of the co-creation process itself, with the aim of investigating the implementation of the programme, how it was experienced by the operators, and how it might be improved or altered if it were repeated on a larger scale with other operators.

This report details the findings of the impact evaluation. The process evaluation is reported in a separate document (also conducted and produced by BIT), and Revealing Reality have also produced their own summary report documenting the co-creation process and including the interventions themselves.

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[4]See for example the preprint Newall et al, "Testing a gambling warning label's effect on behavior" (2019), PsyArXiv. Preprint available at https://doi.org/10.31234/osf.io/dxfkj
[5]https://about.gambleaware.org/media/1581/revealing-reality-igrg-report-for-gambleaware.pdf
[6]https://bettingandgamingcouncil.com/safer-gambling/

The participants represent a mix of different types of gambling operators, including online slots, sports betting, physical casinos and bingo (both on- and off-line). This presents the opportunity to evaluate messaging interventions, and the programme itself, in a wide variety of contexts. Online and offline interventions typically take very different forms and it is important to evaluate them in as many contexts as possible, to identify any specific enablers or issues that may only apply in certain situations.

The messaging interventions were developed by the operators, supported by Revealing Reality, from summer 2019 until spring 2020. BIT has interviewed delegates from a number of these operators as part of our process evaluation.

The original intention was that each operator would run an evaluation during summer and/or autumn 2020, with BIT's help. In practice, the Covid-19 pandemic has meant that some compromises have been made, and in particular we were unable to gather significant evidence on how messaging might work in physical gambling spaces (casinos, betting shops and so on) as these were forced to close. Some operators were able to conduct evaluations online (and 888, as an entirely online operator, were able to execute their original evaluation plan). Some evaluations were able to continue with some modifications, some had to be cut short, and some were rendered impossible. There was also one case where the intervention itself was discontinued as it encouraged recipients to take a break from gambling to go outside and socialise with others, which was against the social distancing requirements in force at the time.

Whilst we necessarily determine the effectiveness of the individual interventions that each operator has developed as part of this programme, we are more concerned with the effectiveness of the programme itself than that of the individual interventions, especially given the disruption caused by the pandemic.

Methodology

We were able to conduct at least some evaluation activity with five of the operators who took part in the programme: 888, Betfred, Buzz Bingo, Gamesys and Genting Casinos. In some cases we were able to evaluate the interventions as the operator developed them, and in others we chose instead to evaluate Covid-specific safer gambling interventions.

The individual evaluations are described below. In general, we are concerned with three categories of outcomes:

- The proportion of customers who use safer gambling[7] tools. This includes setting deposit limits; setting other limits on play (such as a maximum length of time) and enabling in-session reminders after certain periods of time have elapsed (sometimes referred to as “reality checks”);

- The play time and amount of money deposited by customers. This includes any safer gambling triggers which might have occurred, as well as instrumental variable analysis to identify the effect of setting a deposit limit on the amount actually deposited; and

- Customer engagement with the intervention materials themselves (for example, as measured on social media).

We now outline the evaluation work we carried out in partnership with each operator.

888

888 tested two interventions with randomised controlled trials on their casino platform https://www.888casino.com.

The first trial tested a new sign-up process on a randomly selected group of 39,091 new 888 customers. The customers were rated by 888 based on certain risk factors including the customer's age, with high-risk customers only being part of this trial. These customers were randomly selected either to receive the business-as-usual sign-up process, or an altered process where a deposit limit tool was included as part of the sign-up procedure, on the final page before the customers were able to deposit money and start to gamble. 2,363 customers received the intervention with the remaining 36,728 receiving the business-as-usual process.

The second trial focused on 12,453 individuals who had already made their first deposit with 888. This trial contained customers from all risk groups. Participants in the treatment group were shown a reminder pop-up (a message box which had to be acted on or dismissed

[7] Most operators will generally refer to “responsible gambling” (RG) rather than “safer gambling”. In this report we use GambleAware’s own recommendation and refer to safer gambling throughout.

before the participant could continue), suggesting that they set a deposit limit. This reminder was shown the second time they logged in. Participants in the control group did not receive the pop-up. There was no “control pop-up”. 2,617 customers received the pop-up and the remaining 9,836 customers received no pop-up.

The two trial groups did not overlap. No individual customer was part of both trials. The trial period ran from 3rd June 2020 until 15th July 2020.

We measure the effect of these interventions on the following outcomes:

- The proportion of customers who set a deposit limit within seven days of receiving the intervention (or within seven days of when they would have received it, for the control groups). In the first trial, this is equivalent to seven days from account creation. In the second trial, the outcome is measured from the first time the customer makes a deposit.

- For those customers who do set a deposit limit, we investigate whether the amount of the deposit limit is affected by the treatment.

- The amount of money deposited by customers, whether they set a deposit limit or not. [8]

- The number of customers triggering safer gambling alerts, whether they set a deposit limit or not. Alerts may be triggered due to a number of reasons including exceeding pre-agreed deposit or playing time limits; betting with erratic stakes or at very high frequency; loss chasing; and making multiple or increasing deposits in a short period of time.

If we are prepared to make the assumption that the interventions (that is, the altered sign-up process and the pop-up) only affect the amount deposited by causing customers to set deposit limits, then we are able to estimate the effect of the deposit limits themselves on the amount of money that customers actually deposit. We do so using an instrumental variable approach, using the treatment assignment as an instrument for the amount of money deposited.

Box 1: Instrumental Variables

Instrumental Variables[9] are a statistical approach which can estimate the causal effect of an action A on an outcome O. It requires that we administer a treatment T, which only affects O *because it has caused participants to do A*, and not through any other mechanism. In this example, if we are prepared to assume that encouraging participants

[8] Most operators consider the actual monetary amount of customer deposits to be financially sensitive information. Accordingly, we only report the relative change between the treatment and control groups for this outcome.
[9] See for example Angrist et al, "Identification of causal effects using instrumental variables." *Journal of the American Statistical Association 1996.*

to set a deposit limit only affects the amount they deposit *because it influences them to actually set a deposit limit*, then an instrumental variables approach will tell us the effect of A (setting the deposit limit) on O (the amount of money deposited).

Betfred

Betfred were also able to implement a randomised controlled trial on a randomly selected sample of 43,346 of their online customers.

Three interventions were tested, an email, an SMS and a “rich inbox” intervention. The latter was delivered to customers’ mailbox within their Betfred account, rather than as an email. This allowed for more dynamic content to be displayed.

The treatments were administered from 28 May 2020 until 23 July 2020. Each treatment was given to 10,838 individuals, except for the rich inbox treatment which was administered to 10,832 customers.

We measure the effect of these interventions on the following outcomes, at one and two weeks after intervention:

- The amount of money deposited by customers following registration;
- The total duration of play by customers;
- The total duration of play during “antisocial hours”, defined as between 00:00 and 05:59; and
- The proportion of customers whose gambling behaviour is classified as “low” or “medium” risk by Betfred’s internal classification.

Buzz Bingo

As a result of participating in the programme, Buzz made a number of changes to their online experience. These included

- Pop-up messages shown to customers who log in three times or more in one week;
- A second set of pop-up messages shown to customers who make three or more deposits in one week;
- Changes to the layout of the safer gambling section of the website to make tools more accessible;
- Permanently visible safer gambling banners on the home page and in bingo rooms;
- Weekly emails to customers; and
- Changes to the know-your-customer phone call process to include safer gambling checks.

These were implemented wholesale across Buzz’s website rather than as a randomised trial. As such, we cannot be certain that any changes in outcomes which happened afterwards are because of these changes. In particular, the changes took place in early April which

coincided with the earliest, strictest period of Covid-19 lockdown and we might expect customers' behaviour to have changed because of that external factor.[10]

As such, we focus mainly on the uptake of safer gambling tools as a proportion of new customers joining Buzz Bingo. These tools include deposit limits, time limits, self exclusions and "reality checks" (where the user asks for a pop-up message to be displayed after they have been gambling for a certain period of time).

Gamesys

Gamesys developed a messaging campaign called "share the joy" which encouraged users to take a break from gambling by going out to enjoy their winnings. This was promoted on social media and via email.

The campaign was cut short due to the pandemic; the messaging was considered to be at odds with the prevailing government advice to stay at home where possible. As such, we are able to measure the engagement (the number of social media users who interacted with the campaign, either by viewing videos, facebook-liking it or making comments, as a proportion of all users who had the content served to them). We also measure the email open and click-through rate.

The campaign was targeted at all Jackpotjoy (one of Gamesys' online sites) customers and was not randomised.

During the pandemic, Gamesys focused on developing their understanding of how best to engage with their user base on safer gambling. No further formal impact evaluation was carried out.

Genting Casinos

Genting Casinos originally developed intervention programmes across both its online and offline operations. There were two interventions intended for their physical casinos: a set of message screens which would be shown on their in-casino ATMs and messaging on slots machines encouraging customers to make use of reality checks and set limits. We were unable to evaluate these as the casinos were forced to close during the pandemic.

Genting Casinos also delivered a number of email interventions for their online customers. These were primarily concerned with establishing that customers could afford to lose the amounts of money they had deposited, however they also included messaging related to Covid-19 and how that might have impacted customers.

Genting Casinos sent a total of five emails:

[10] See for example the GambleAware-commissioned research into gambling behaviours during Covid-19 at https://about.gambleaware.org/media/2284/yougov-covid-19-report.pdf which found that "5% of gamblers said they had used some type of safer gambling tool", 2% of which had used safer gambling tools provided by gambling companies themselves (as opposed to exclusion mechanisms).

- The “Covid-19” email was sent to all online customers and drew attention to the ability to set deposit limits, as well as including contact details for the National Gambling Helpline.
- The “removal of reverse withdrawals and Covid-19” email advised customers that they would no longer be able to reverse a withdrawal transaction.
- The “Credit card ban” email was sent to customers to inform them that Genting Casinos would no longer be accepting deposits from credit cards, in line with an industry-wide change from 9th April 2020.
- The “Welcome affordability email” and “Second welcome affordability email” were sent to customers creating new Genting Casinos accounts, 1 and 5 days after account creation.

In total, 483,192 emails were sent to Genting Casinos’ customers.

We measure the difference before and after the emails are delivered in the number of sessions, the number of days logged on, and the total number of minutes played. The before and after periods are each four weeks long.

As with Buzz Bingo, this difference is evaluated before and after the emails were sent. The emails were distributed to all relevant customers rather than on a randomised basis.

A note on the presentation of results

When we present results (either in tabular or graphical form), we always present them on a comparable basis. That is, for trials with a control and a treatment group, we display

a) In the control group, the actual observed result;
b) A statistical estimate of what would have happened to the control group if we had treated it. This is based on a regression model, and accordingly has some statistical uncertainty which we represent with error bars. The error bars indicate a 95% confidence interval. In other words, we are 95% confident that if we had treated the control group then the result would have been within that interval. This includes an adjustment for any known differences between the experimental groups (such as age and gender, where that is recorded in the data).

We present the results this way, because the reader can infer that the treatment effect is the difference between the two quantities. This is not true for most other formulations.

In many cases (particularly relating to the amount of money deposited by customers), in order not to reveal financially sensitive information we present the relative effect only. That is, the control group outcome is defined to be 100 units and the treatment group outcomes are expressed relative to that point. This does not mean that the average customer deposited £100, for instance.

Findings

Uptake of safer gambling tools

We find, in general, that the interventions developed by the operators in the safer gambling programme were effective at encouraging customers to enable safer gambling tools such as deposit limits, play time limits and in-session reminders (sometimes referred to as “reality checks”).

When 888 altered the sign-up process to include a deposit-setting tool, the proportion of customers who set a deposit limit increased significantly, from 1% to 9.3%.

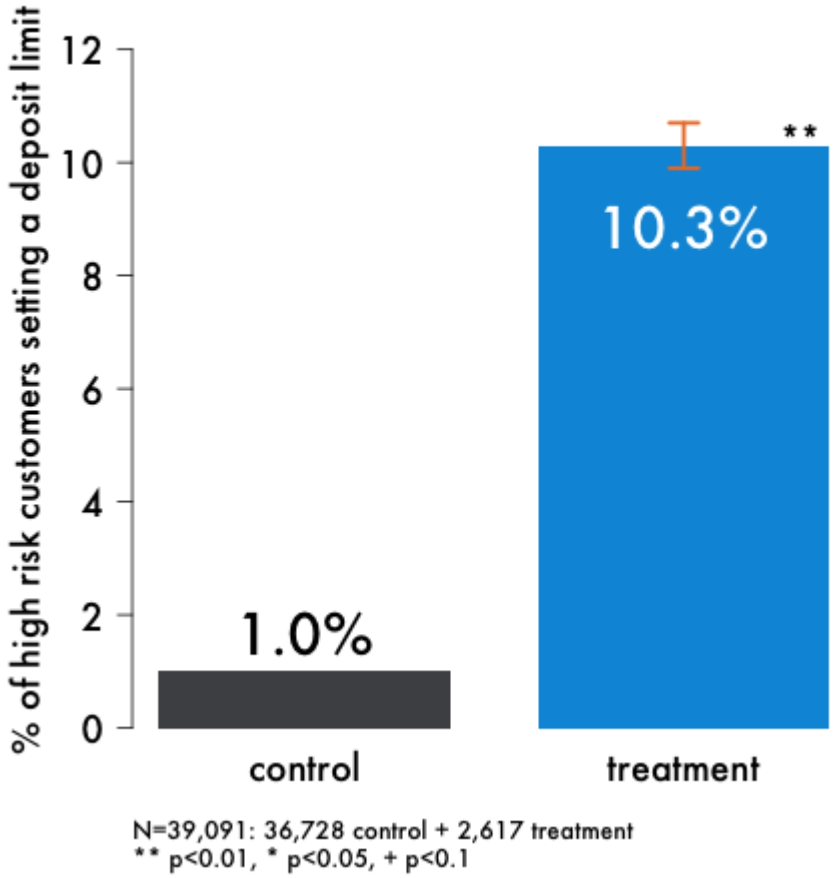

Figure 1. Proportion of high-risk customers setting a deposit limit within seven days of the treatment date.

This is consistent with other findings from BIT’s research into encouraging users to set deposit limits; in a 2018 trial with bet365, we found that reducing the friction costs associated with using any safer gambling tool (including but not limited to deposit limits) doubled the

proportion of customers doing so, from just over 6% to 12%[11]. The bet365 trial does have some differences — it was with a different operator and the intervention was focused on simplification rather than salience. Nonetheless there is a common theme that increasing focus on setting a deposit limit during the sign-up process has a large positive effect on the proportion of customers who do so, and there is strong evidence for that finding.

By contrast, the second 888 trial (for customers who had already made their first deposit) showed no evidence of an effect:

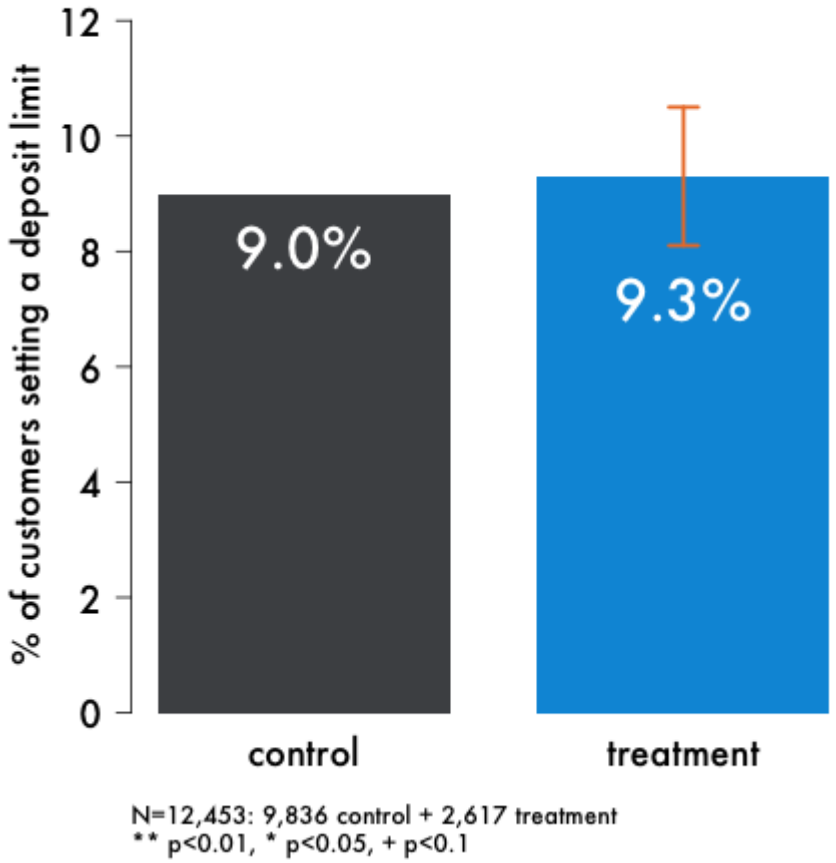

Figure 2. Proportion of customers who have already made their first deposit, who set a deposit limit.

Even though we did not observe a significant treatment effect, a notable finding is that the proportion of untreated customers who set a limit is much lower in the high risk customer group than amongst the general group of customers who have made a deposit. This suggests that interventions may benefit from being focused specifically on high risk customers.

Two other operators also saw a large pre/post increase in the uptake of safer gambling tools:

[11] BIT Annual Update report 2017–8 p11: https://www.bi.team/wp-content/uploads/2019/01/BIT-Annual-Update-Report-2017-2018-web-1.pdf

- Gamesys observed 781 players enabling session reminders in the week after a reminder email was sent, compared to much lower rates in other weeks (typically <10 customers per week). Given the magnitude of the effect and the short timescale, it is very likely that this effect was caused by the reminder email.[12]

- Buzz Bingo observed a similarly large increase, from single digits per month to approximately 280 in the month following an advertising campaign promoting the "reality checks" feature.

There is some evidence that these interventions are likely to work more as reminders than as informing customers of features of which they were previously unaware. Gamesys' customers had previously indicated that they were generally aware of session reminders' existence[13], however they thought that the reminders were more restrictive than they actually were — 31% thought that the session reminder would disable the session and disallow further gambling once a set time limit had elapsed, when in fact a reminder would appear at that time which could be dismissed, allowing the customer to gamble further.

Effect of increased uptake of deposit limits

Since 888's altered sign-up process had a strong effect on the proportion of high-risk customers setting a deposit limit, we are able to determine the consequent effect on the amount of money deposited.

We find that setting a deposit limit does not have a detectable effect on the amount of money deposited. The actual pound amounts are commercially sensitive, but the graph below shows the effect in relative terms:

[12] In theory, another external effect could be responsible for this change (and the email campaign was delivered close to the beginning of the first national Covid-19 lockdown in 2020), however the magnitude of the change is so large that we believe it is very unlikely to be entirely down to external circumstances.
[13] Source: Gamesys annual safer gambling survey 2018 and 2019.

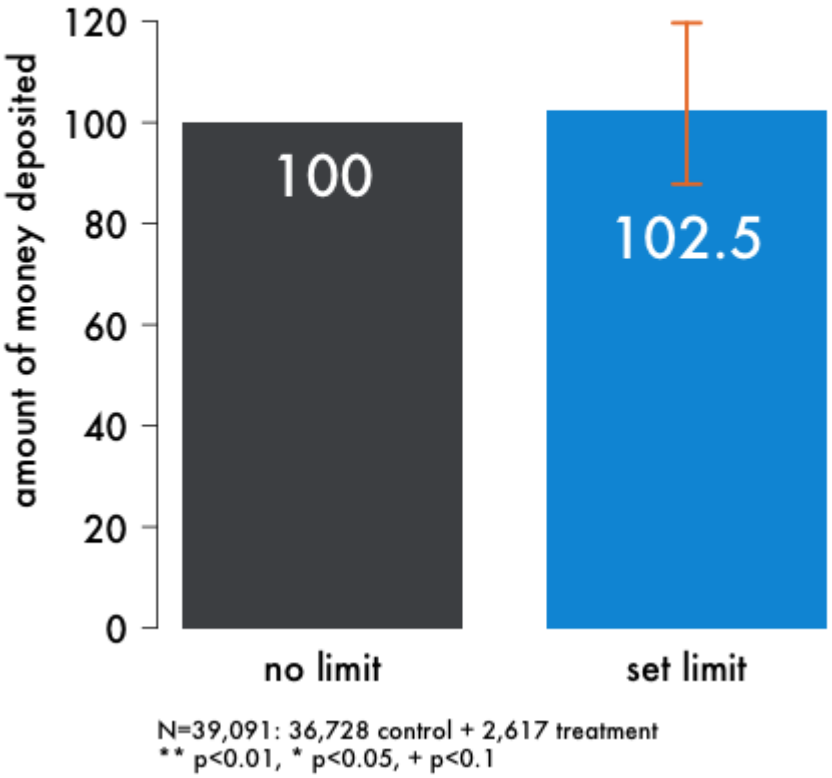

Figure 3. Relative amounts of money deposited by high-risk customers according to whether they set a deposit limit (instrumental variables analysis). The amount for those not setting a limit is defined to be 100 units.

We do not replicate this analysis for the second 888 trial, because the intervention did not have a significant effect (which is a necessary assumption for this method).

Play time and deposit amounts

In overall terms, we find that the interventions do not have a detectable effect on the total play time or deposit amounts that customers make. This is an important finding for two reasons. Firstly, it corroborates the finding in the previous section that setting a deposit limit did not cause a detectable change in the amount actually deposited; and secondly it highlights the need for more evidence linking uptake of safer gambling tools to downstream outcomes such as amount deposited and ultimately gambling related harm.

In the Betfred trial, we found that there was no detectable effect of any of the interventions on the amount of money customers deposited. With over 10,000 customers in each arm of the experiment, we would have been more than 95% likely to observe a significant change if any treatment had changed the average deposit amount by 1% or more:

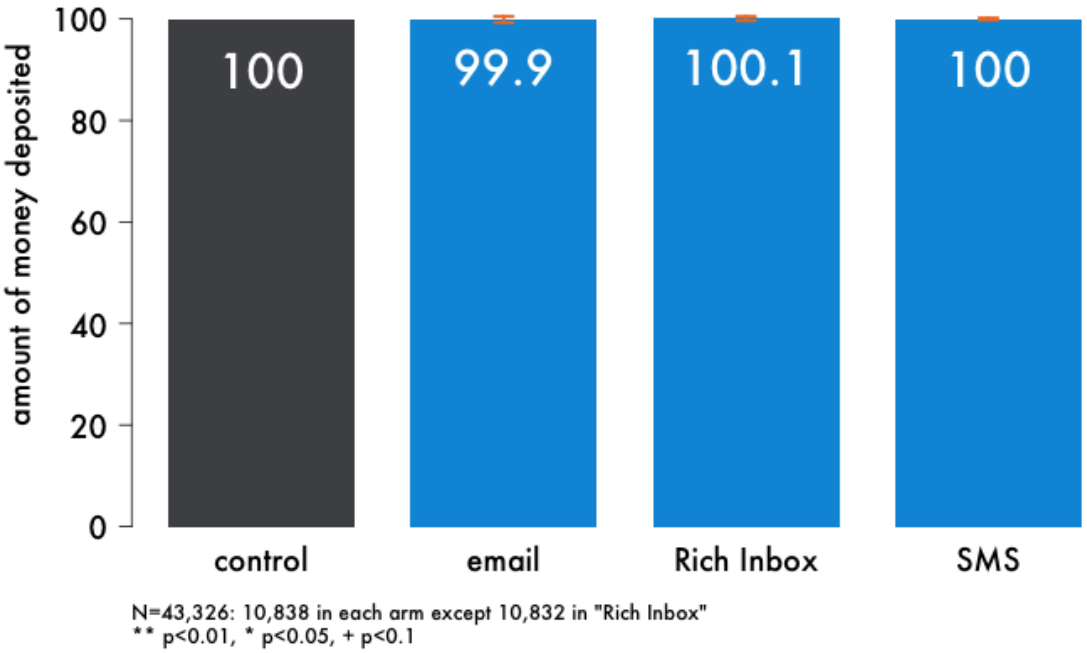

Figure 4. Relative amounts of money deposited in the week after intervention by Betfred customers, controlling for amount deposited prior to the trial period. Amounts are scaled so the control group is defined to be 100.

The results two weeks after intervention are substantively the same as after one week[14]. No treatment had a significant effect.

Similarly, Betfred's interventions had no detectable effect on the length of play time one and two weeks after intervention. The observed differences were all less than one per cent, and none of them were statistically significant:

[14] These results can be found in the appendix in table 14.

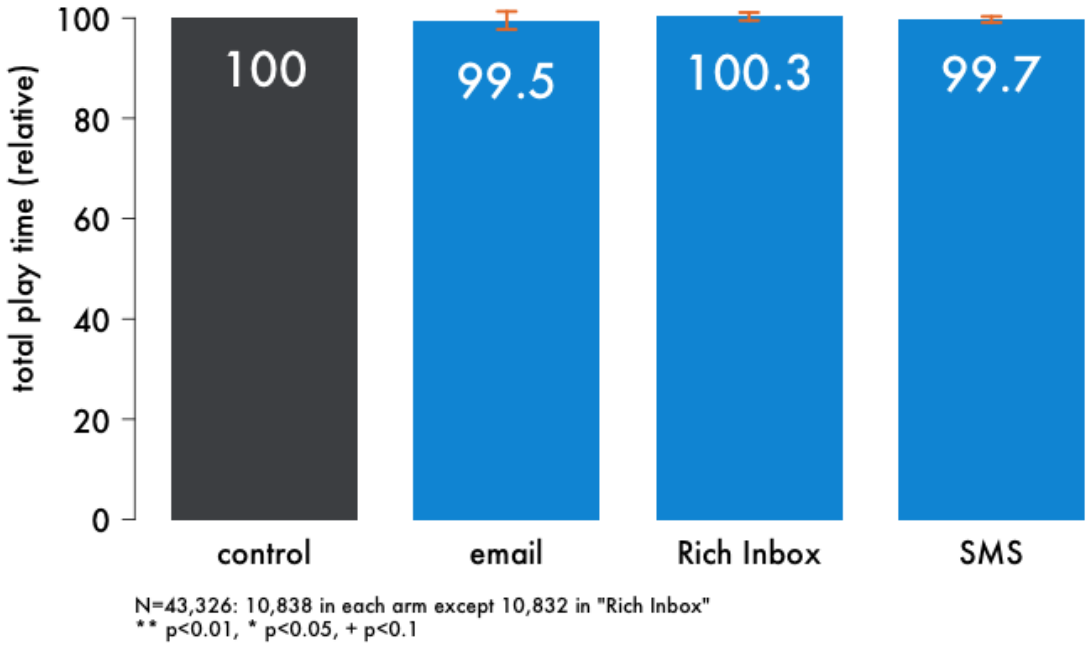

Figure 5. Play time in the week following the Betfred intervention. Results are scaled such that the control group is defined to be 100 units.

This pattern is also observed in the second post-treatment week, where there are no significant differences between the treatment groups.

There was no significant difference in the amount of play during antisocial hours (0000–0559) in any of the treatment arms of the Betfred trial and no difference in the proportion of players whose gambling activity was categorised as low- or medium-risk[15].

We did observe a significant difference in play time before and after Genting Casinos sent their intervention emails to their customers. The difference ranged from 11 minutes fewer (for the credit card ban emails) to 131 minutes more (for the second affordability check email):

Table 6. Difference in play time before and after emails sent to Genting Casinos customers.

Email	Difference in play time
Covid-19 email	3.93 fewer minutes
Removal of Reverse Withdrawals + Covid-19 email	1.78 more minutes
Credit Card Ban	11.03 fewer minutes
Affordability email	48.47 more minutes
Affordability email 2	131.72 more minutes

[15] The full results can be found in tables and figures 13–16 in the appendix. All p-values were at least 0.1, and outcomes varied by no more than 0.3% in relative terms between arms.

In the context of the Betfred result, we believe that this is likely to be down to selection effects. In other words, the emails did not *cause* their recipients to change the amount of time they spent playing. Instead, the fact that a customer received one of those emails indicates that they were more likely to be on an upwards or downwards trajectory of their play time. For instance, customers receiving affordability emails would be likely to increase their play time once they had passed the affordability process; and customers who received the email about credit card bans would be likely to decrease their play time.

This illustrates the main problem with evaluating interventions by comparing outcomes before and after the intervention happened, outside the context of a randomised controlled trial — any differences between groups might not be caused by the intervention itself, which leads us to be less confident in the results unless we have a separate randomised trial to back them up.

In the 888 trial with high risk customers, we find that there is no detectable effect of the intervention on the amount of money customers deposit:

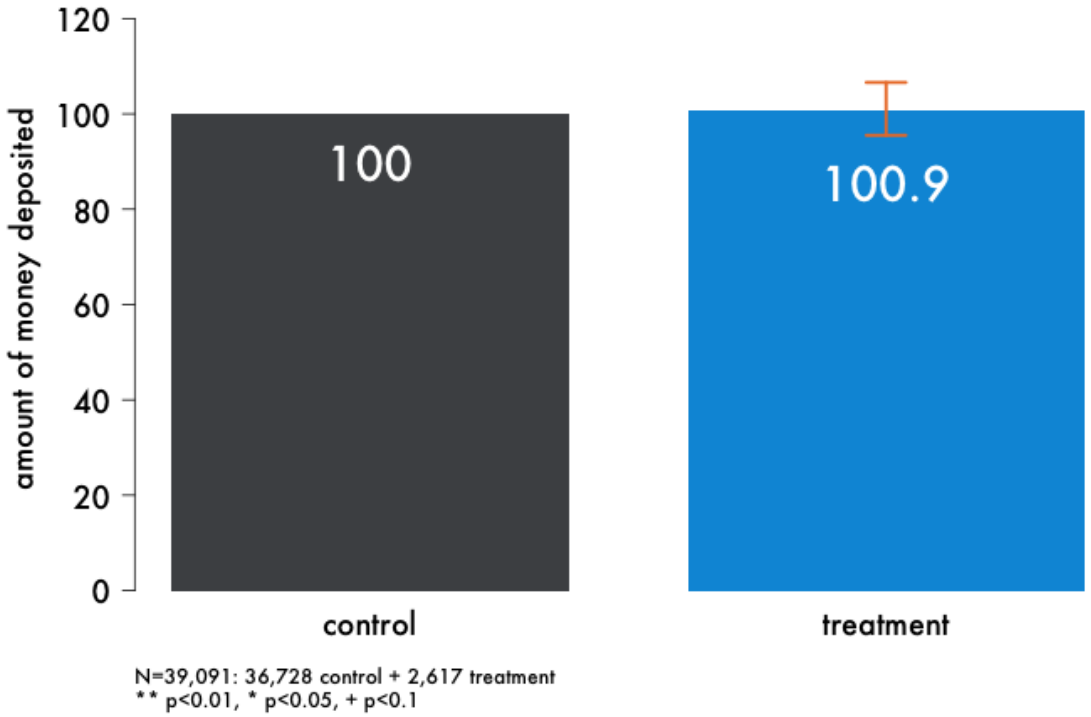

Figure 7. Relative amounts deposited by high risk 888 customers during the trial period. The control group outcome is defined to be 100 units.

A similar result occurred in the other 888 trial with customers who had already made a first deposit. There was no significant difference in total deposits between the two experimental groups:

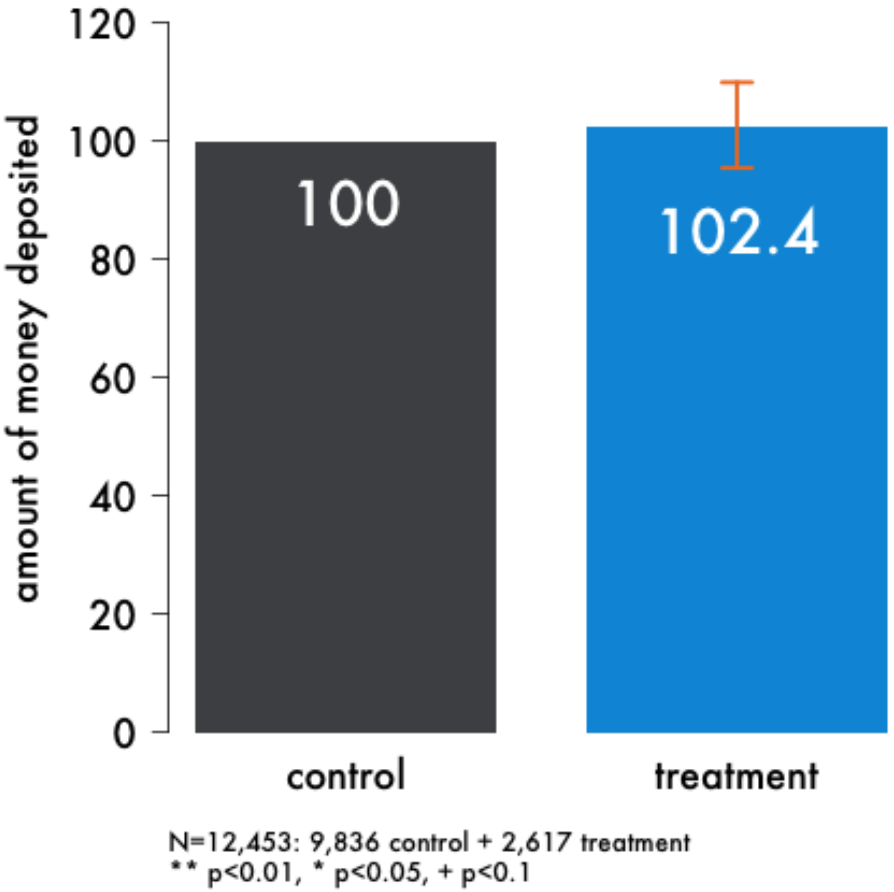

Figure 8. Relative amounts deposited by 888 customers who had made their first deposit already, during the trial period.

These results are consistent with the instrumental variables analysis. We have evidence that changes to the sign-up process can increase the proportion of customers (particularly high-risk customers) who set a deposit limit, however we have no evidence that setting a deposit limit translates into customers actually depositing less money.

We also observed no detectable differences in any of the groups in Betfred's trial, with none of the treatment groups having more than a 0.5% difference from the control group.

Engagement

Gamesys was the only operator to measure engagement quantitatively, though we address engagement in more detail in our process evaluation.

Gamesys reported that the engagement with their pre-Covid safer gambling messaging was higher than any of their other social media content in March 2020. This included one post on Instagram and three on Facebook.

It is worth nothing that Gamesys' Facebook messaging asked recipients to engage with it in ways which had some friction associated with them (such as posting their own pictures). This result demonstrates that it is possible to achieve substantial engagement even with these requirements, and if a safer gambling message might be effective despite requiring some effort from the recipient it should not be dismissed out of hand.

Finally, Gamesys asked participants in their July 2020 safer gambling survey whether they felt they had noticed more messages about safer gambling during lockdown. 87% either agreed or strongly agreed, though we cannot be certain how representative the survey group is of customers as a whole. In particular, the survey was promoted on social media in the same way as Gamesys' other posts, so participants would be more likely than normal to have seen Gamesys' other safer gambling posts.

Limitations

The findings are based on a variety of experimental methods. Accordingly, different findings have different limitations:

- This programme had intended to address safer gambling messaging and engagement in physical spaces such as betting shops and casinos, as well as online. We address the creation of those materials in the process evaluation, but owing to the pandemic we were unable to evaluate how effective they were in practice, or any practical barriers that might have arisen when they were implemented.

- The finding that 888's and Betfred's interventions did not cause any difference in play time are based on randomised controlled trials with a large sample size. In 888's case the sample consisted of high risk customers, and in Betfred's case the sample consisted of low- and medium-risk customers. As such, while there might be differences in how the operators classify customers into risk groups[16], the two trials span the full risk spectrum of customers. The main limitation in this finding is that we are only considering two interventions and that other interventions that might be developed in future programmes have idiosyncrasies of their own.

- The finding that encouraging users to set a deposit limit does not affect the amount they deposit requires us to assume that the initial intervention (in this case, the altered sign-up process) only affects deposit amounts by encouraging customers to set a deposit limit, and not through any other mechanism which does not involve setting the limit itself.

[16] Operators generally consider their risk algorithms to be commercially sensitive and we are unable to disclose how any of the operators in this programme identify low- and high-risk customers.

Conclusions

The ultimate aim of this programme is to develop interventions which will reduce gambling harms to customers. We cannot say definitively whether that has occurred, but we can say that at least some of the interventions have caused significant differences in the uptake of safer gambling tools.

Further research should focus on establishing the causal link between increased uptake of safer gambling tools and reduction in gambling harms, as measured in a natural gambling context as opposed to a laboratory trial. There are very limited evaluation opportunities to close this evidence gap, and a continuation of this programme would allow this causal evidence to be generated provided that the necessary outcomes are measured in the context of randomised controlled trials.

There is inevitably some tension between increasing uptake of safer gambling tools and bottom-line outcomes for operators (such as the total amount deposited or total play time). We found no evidence that developing effective safer gambling interventions had any negative impact on these at all. Further, safer gambling messaging proved to be an effective way to engage with customers and could have potential as a general engagement and advertising technique.

This finding is encouraging, because it suggests there is the opportunity to normalise the use of safer gambling tools while still engaging effectively with customers on social media. There is evidence[17] that limited uptake of safer gambling tools is partly due to the fact that customers “perceived [them] to be intended for people with gambling problems” (Gainsbury et al, 2019).

Given that the interventions did not ultimately affect play time or the amount deposited despite some of them affecting the take up of safer gambling tools, this naturally raises the question of whether the safer gambling tools in question are effective in reducing gambling harms. This is another reason behind our recommendation that future incarnations of this programme focus on addressing that evidence gap. This evaluation has produced evidence that the specific case of successfully encouraging a customer to set a deposit limit does not influence the amount of money that customer deposits, however that is not a gambling harm outcome.

In the specific case of deposit limits, the size of the limit, and whether the limit is set when the customer first sets up an account or later on, could be a key determinant of whether the deposit limit is effective at reducing harm. We recommend that this is included in the

[17] Gainsbury et al, “Use of Consumer Protection Tools on Internet Gambling Sites: Customer Perceptions, Motivators, and Barriers to Use” *Journal of Gambling Studies* 2019. https://research.bond.edu.au/en/publications/use-of-consumer-protection-tools-on-internet-gambling-sites-custo

evaluation framework in future versions of this programme and measured during any trials conducted therein.

On the basis of the results we have observed here, we consider that the programme has produced measurable changes and as such we recommend that it continues. We also recommend the following:

- The programme should maintain its research focus, at least for the next iteration. Two particular areas of research interest are the causal link from increased uptake of safer gambling tools to reduced gambling harm, and the effectiveness of safer gambling interventions in physical spaces.

- Given that some interventions have the possibility of greatly increasing the uptake of safer gambling tools such as deposit limits, instrumental variables approaches can be used to measure the effectiveness of the tools themselves. This is a valuable opportunity which may disappear once messaging interventions of this kind become routine.

- The default evaluation method should be randomised controlled trials. We have seen that some of the pre-post evaluations have produced findings which are radically different to randomised trials of similar interventions. The most likely explanation is that the differences were caused by something other than the treatment, which is not consistent with the objective of evaluating the impact of the interventions themselves.

These are the impact focused recommendations. We make more extensive recommendations for the programme in our process evaluation report, in particular addressing the research question of how operators can implement best practice in designing and delivering their interventions.

Appendix

This appendix includes the regression tables and graphs for outcomes which were not included in the main report. They include results from 888, Betfred and Genting Casinos. Buzz Bingo's and Gamesys' results are descriptive only; there are no regressions underlying them.

In the regression tables, the figures are parameter estimates together with significance marks (one star for 5%-significant deviations from zero; two stars for 1%-significant deviations from zero and three stars for 0.1%-significant deviations from zero). The figures in brackets indicate the standard error of the parameter estimates, with the figures below those being the p-values. The outcome measure is listed at the top of each column and the bottom rows include information on which type of regression model was fitted, whether there were any other covariates and the total sample size.

Regression tables: 888

These regression tables compare the outcomes across the different arms of the trial. The outcome "Deposit amount (IV)" refers to the instrumental variable analysis of the effect of setting a deposit limit on the amount of money deposited. Parameters for logistic regressions are additive changes in the log-odds ratio.

Table 9. 888 sign-up trial results.

	(1)	(2)	(3)	(4)
	Set deposit limit	Deposit amount	Deposit amount (IV)	Safer Gambling Triggers
Treatment	4.062*** (0.068) $p<10^{-308}$	0.009 (0.028) p=0.76	0.025 (0.079) p=0.76	-0.263 (0.297) p=0.38
Model	Logistic	OLS on log(1+x)	OLS on log(1+x)	Logistic
Covariates	Gender, Age, Income	Gender, Age, Income	Gender, Age, Income	Gender, Age, Income
N	39,091	39,091	39,091	39.091

* p<0.05, ** p<0.01, *** p<0.001, marginal effects

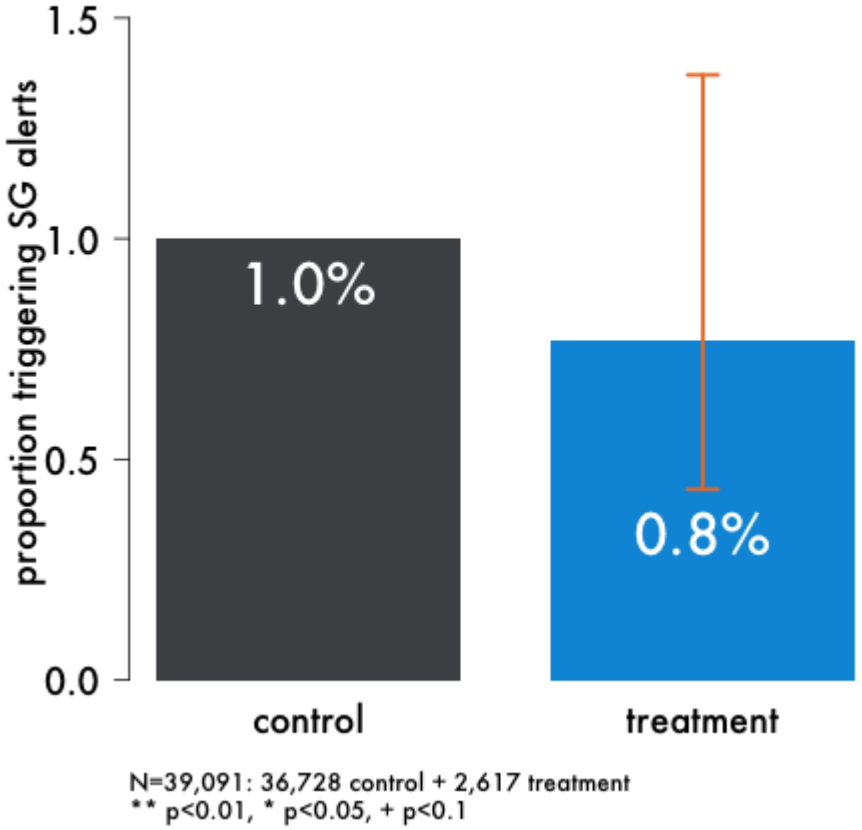

Figure 10. Proportion of customers triggering safer gambling alerts in each arm of the 888 sign-up trial.

Table 11. 888 reminder pop-up trial. The Instrumental Variables parameter is shown in the third column, however it is largely meaningless as the instrument has no significant first stage effect (i.e. the intervention did not significantly affect the number of customers setting a deposit limit).

	(1)	(2)	(3)	(4)
	Set deposit limit	Deposit amount	Deposit amount (IV)	Safer Gambling Triggers
Treatment	0.036 (0.078) p=0.65	0.024 (0.036) p=0.51	8.343 (19.546) p=0.67	0.168* (0.085) p=0.047
Model	Logistic	OLS on log(1+x)	OLS on log(1+x)	Logistic
Covariates	Gender, Age, Income	Gender, Age, Income	Gender, Age, Income	Gender, Age, Income
N	12,453	12,453	12,453	12,453

* p<0.05, ** p<0.01, *** p<0.001, marginal effects

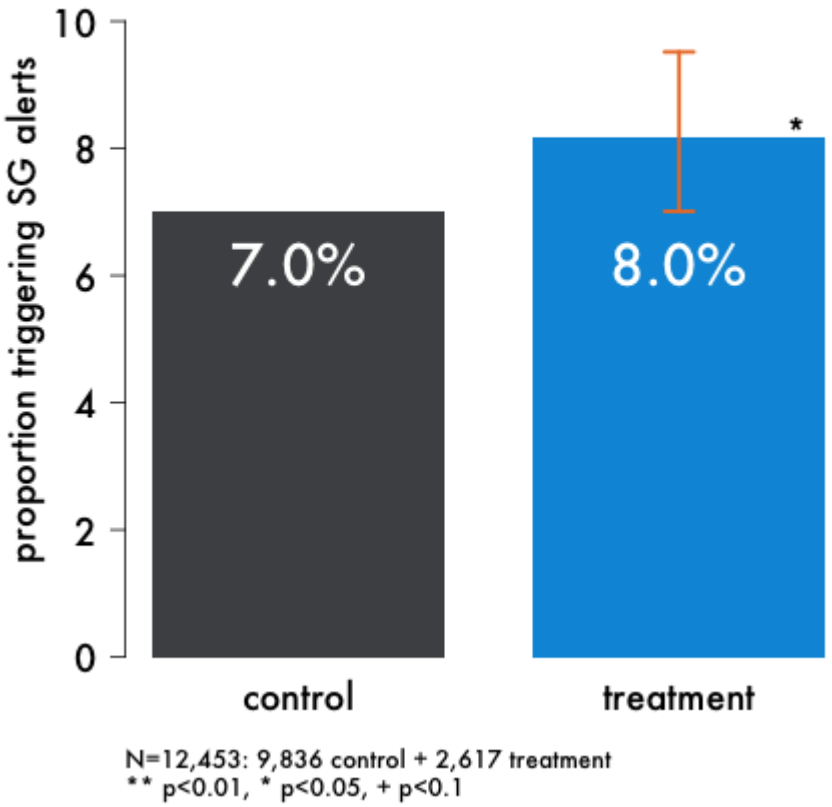

Figure 12. Proportion of customers triggering safer gambling alerts in each arm of the 888 deposit limit prompt trial.

Regression tables and graphs: Betfred

These regression tables compare the outcomes across the different arms of the trial. The outcome “antisocial play hours” is defined as the number of hours played between 0000 and 0559. For each outcome, we control for the same outcome one and two weeks before the intervention as a baseline. The outcome “proportion low- or medium-risk” is the proportion of customers whose gambling behaviour was classified as low- or medium risk by Betfred’s classification algorithm.

Table 13. Betfred results 1 week after intervention.

	(1)	(2)	(3)	(4)
	Play time	Antisocial play hours	Deposit amount	Proportion low- or medium-risk

Treatment Email	-0.005 (0.009) p=0.60	0.003 (0.002) p=0.161	-0.001 (0.003) p=0.82	0.008 (0.020) p=0.67
Treatment Rich Inbox	0.003 (0.004) p=0.56	0.0003 (0.001) p=0.78	0.001 (0.001) p=0.36	0.014 (0.010) p=0.16
Treatment SMS	-0.003 (0.003) p=0.31	-0.0004 (0.001) p=0.57	-0.0002 (0.001) p=0.85	-0.002 (0.007) p=0.74
Model	OLS	OLS	OLS on log(1+x)	Logistic
Covariates	Deposit limit at -1 and -2 weeks	Antisocial play hours at -1 and -2 weeks	Deposit amount at -1 and -2 weeks	Risk classification at -1 and -2 weeks
N	43,326	43,326	43,326	43,326

* p<0.05, ** p<0.01, *** p<0.001, marginal effects

Table 14. Betfred results 2 weeks after intervention.

	(1)	(2)	(3)	(4)
	Play time	Antisocial play hours	Deposit amount	Proportion low- or medium-risk
Treatment Email	-0.002 (0.012) p=0.89	0.002 (0.002) p=0.33	0.0002 (0.003) p=0.96	0.016 (0.023) p=0.49
Treatment Rich Inbox	0.002 (0.006) p=0.68	-0.0002 (0.001) p=0.89	0.002 (0.002) p=0.16	0.019 (0.011) p=0.10
Treatment SMS	-0.0002 (0.004) p=0.95	0.0001 (0.001) p=0.56	0.0001 (0.001) p=0.69	0.007 (0.008) p=0.37
Model	OLS	OLS	OLS on log(1+x)	Logistic
Covariates	Deposit limit at -1 and -2 weeks	Antisocial play hours at -1 and -2 weeks	Deposit amount at -1 and -2 weeks	Risk classification at -1 and -2 weeks
N	43,326	43,326	43,326	43,326

* p<0.05, ** p<0.01, *** p<0.001, marginal effects

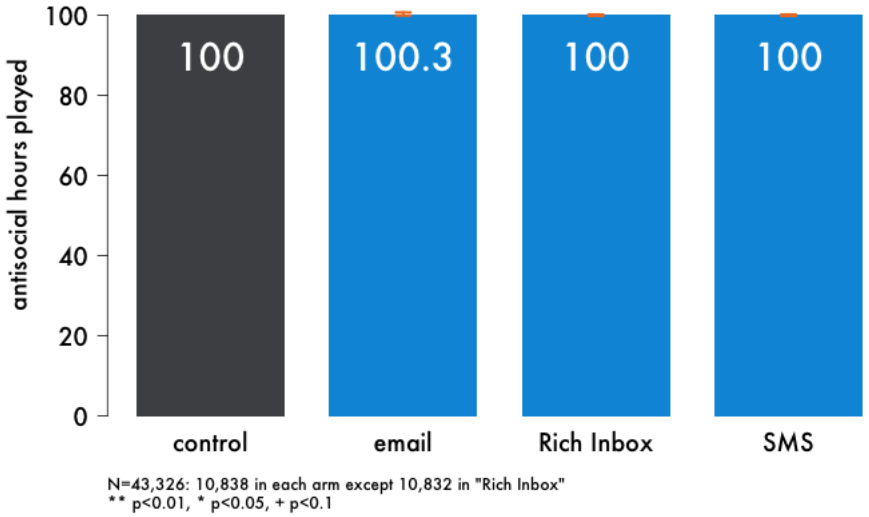

Figure 15. Relative amount of antisocial hours played in each Betfred treatment group, 1 week after intervention.

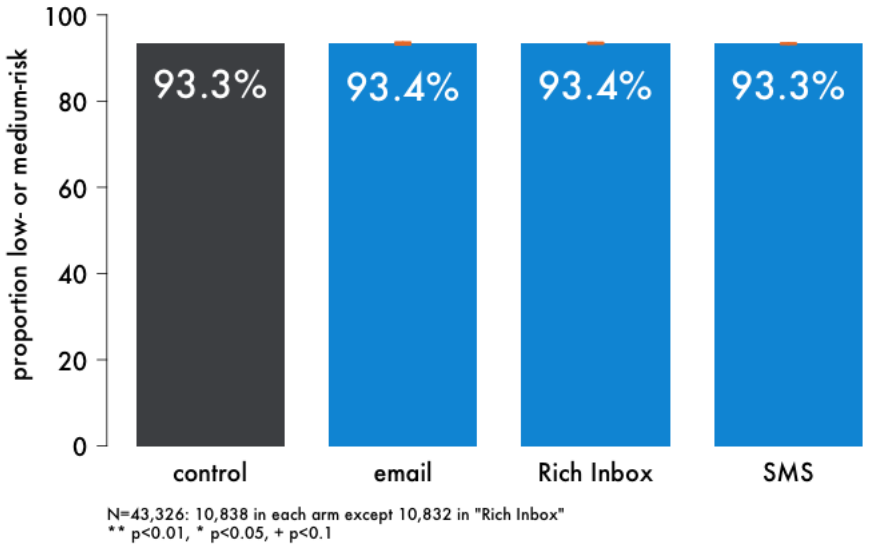

Figure 16. Proportion of customers whose gambling behaviour was classified as low- or medium-risk in the week following intervention in the Betfred trial.

Regression tables: Genting Casinos

These regression tables are on a pre-post basis. The dependent variable is the difference between the outcome in the week after the email was sent and the outcome in the week before the email was sent.

Table 17. Genting Casinos email trial: Difference in pre- and post-logins, logged-on days, and total session minutes

	(1)	(2)	(3)
	Difference in count of logins	Difference in count of logged on days	Difference in total minutes spent in session
Covid-19 Emails	-0.157*** (0.02) $p=4x10^{-15}$	-0.058*** (0.003) $p=3x10^{-83}$	-3.930*** (0.29) $p<10^{-308}$
Removal of Reverse Withdrawals + Covid-19	0.164*** (0.02) $p=2x10^{-16}$	0.103*** (0.01) $p=7x10^{-25}$	1.783*** (0.38) $p<10^{-308}$
Credit Card Ban	-0.340*** (0.02) $p=8x10^{-65}$	-0.177*** (0.003) $p=4x10^{-9}$	-11.028*** (0.35) $p<10^{-308}$
Service - Welcome - Affordability Email	2.900*** (0.21) $p<10^{-308}$	1.092*** (0.04) $p=4x10^{-164}$	48.473*** (3.78) $p<10^{-308}$
Service - Welcome - Affordability Email 2	10.666*** (0.46) $p<10^{-308}$	2.997*** (0.05) $p<10^{-308}$	131.717*** (6.53) $p<10^{-308}$
Model	OLS	OLS	OLS
Covariates	none	none	none
N	483,192	483,192	483,192

* p<0.05, ** p<0.01, *** p<0.001, marginal effects

Table 18. Genting Casinos email trial: Difference in pre- and post-average deposit & withdrawal amounts

	(4)	(5)
	Difference in average deposit amount	Difference in average withdrawal amount
Covid-19 Emails	3.237*** (0.05) $p<10^{-308}$	5.185*** (0.08) $p<10^{-308}$
Removal of Reverse Withdrawals + Covid-19	3.238*** (0.07) $p<10^{-308}$	5.296*** (0.12) $p<10^{-308}$

Credit Card Ban	3.457***	5.520***
	(0.06)	(0.09)
	$p<10^{-308}$	$p<10^{-308}$
Service - Welcome - Affordability Email 2	4.238***	5.916***
	(0.09)	(0.23)
	$p<10^{-308}$	$p=7x10^{-146}$
Model	OLS on log(1+outcome)	OLS on log(1+outcome)
Covariates	none	none
N	8,229	1,824

* p<0.05, ** p<0.01, *** p<0.001, marginal effects

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Chloe works across a wide range of policy areas, with a particular focus on health, education and organisational behaviour. Before joining BIT, Chloe worked as a research and teaching assistant for the Department of Applied Economics at Erasmus University Rotterdam. Prior to this, Chloe worked as a management consultant for 5 years, primarily focusing on economic analysis, process management, organisational effectiveness and change management.

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