

The Pennsylvania
Interactive Gaming
Assessment:

ONLINE GAMBLING REPORT

2 0 2 4

Prepared By:
The Pennsylvania State University

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GLOSSARY

Brief Problem Gambling Screen (BPGS) - The Brief Problem Gambling Screen is a screening measure for problem gambling developed by Volberg and Williams (2011). This measure does not formally classify individuals as problem gamblers; however it does indicate the need for further assessment for the presence of online gambling.

Electronic Gambling Machines (EGMs) - A form of gambling that includes things like slot machines, video lottery terminals, and Video Gaming Terminals (VGTs), as well as digital or virtual table games, which are played alone or against a computer opponent.

Exclusively Offline Gambler (EOFG) - Individuals who have gambled over the past year only through offline gambling formats and have not participated in any form of online gambling.

Exclusively Online Gambler (EONG) - Individuals who have gambled over the past year only through online gambling formats and have not participated in any form of offline gambling.

Fantasy Sports - A form of sports betting that does not rely on the outcome of a single contest; instead, participants pay an entry fee and create a 'fantasy team' to compete against opponents' 'fantasy teams' for additional money or material prizes.

Games of Skill – These are specific forms of EGMs that include a skill element and are located in businesses such as bars, restaurants, and convenience stores. These machines currently operate untaxed and unregulated in Pennsylvania.


Illegal or Unregulated Online Gambling - Gambling on websites/applications that are not legally recognized by any regulatory body in the state of Pennsylvania or engaging in underage online gambling.

Instant Lottery - A form of gambling that includes scratch-off tickets, break-open tickets, pull-tabs, or playing online instant games, where participants reveal outcomes immediately after purchasing or playing.

Legal Online Gambling - Gambling on websites/applications that are legally recognized and licensed by their respective regulatory bodies (e.g., Pennsylvania Gaming Control Board, Pennsylvania Lottery, and Pennsylvania State Horse Racing Commission).

Lottery - A form of gambling that includes raffles, national lotteries, state-run lotteries, and private lotteries, where participants pay for a chance to win prizes based on random draws.

Mixed-Mode Gambler (MMG) - Individuals who have gambled on at least one online format and one offline format over the past year, thereby engaging in both modes of gambling.



Other Gambling - This category includes gambling types not covered in other formats, such as betting on non-casino dice and card games, keno, animal fighting, video games, and television events, where participants place wagers outside of traditional gambling categories.

Sports Betting - Betting money or material value on a sporting event, such as football or baseball, including sports the individual may be participating in themselves, but excluding fantasy sports or e-sports, where wagers determine potential winnings.

Problem and Pathological Gambling Measure (PPGM) – The PPGM is an assessment of problem gambling developed by Williams and Volberg (2010, 2014) that assigns individuals that gamble into categories: recreational gambler, at-risk gambler, problem gambler, and pathological gambler.

Table Games - Gambling on casino-style table games such as poker, blackjack, baccarat, roulette, craps, or other traditional gambling games played with real players, either in a casino setting, online, or in private settings such as games played at home for money.

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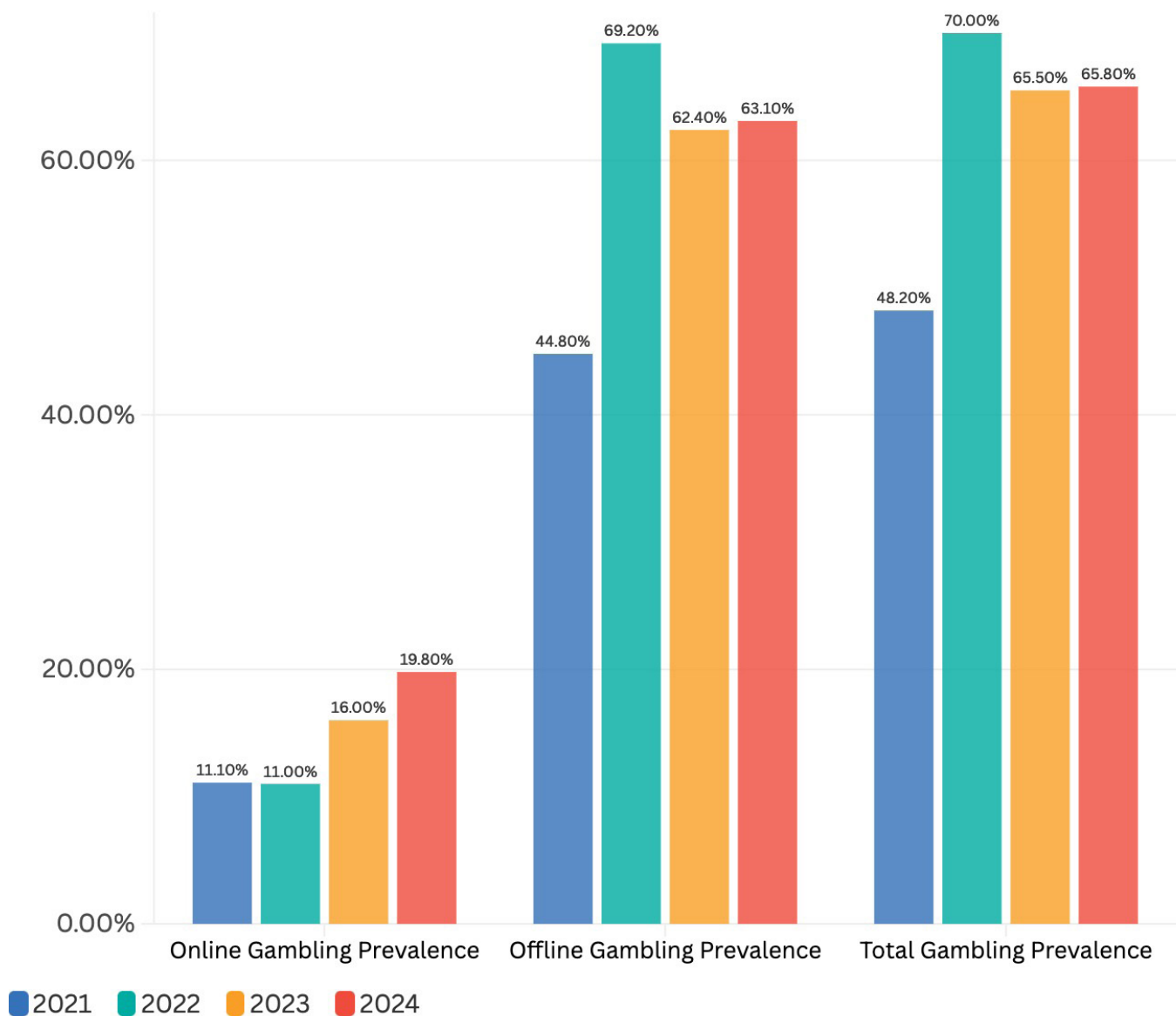
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EXECUTIVE SUMMARY

The Interactive Gaming Assessment is an annual analysis of the impacts of legalized online gambling in Pennsylvania, which began in 2020. Online gambling prevalence was similar the first two years of the assessment, with approximately 11% of the adult population engaging in some form of online gambling. The third year of the assessment saw online gambling prevalence increase to 16%, and in this most recent assessment, online gambling continued to increase in popularity with nearly 20% of individuals indicating they engaged in some form of online gambling in the past year.

Figure 1. Annual prevalence of gambling by mode among Pennsylvania adults.



Nearly 20% of Pennsylvania adults indicated they engaged in some form of online gambling in the past year.



KEY FINDINGS FROM 2023-2024

Gambling Prevalence

Nearly two-thirds of Pennsylvania adults engaged in some form of gambling in the past 12 months (65.8%). Pennsylvanians continue to gamble more offline (63.1%) than online (19.8%). However, 46.0% of residents reported gambling exclusively offline, while the majority of online gamblers also gambled offline and were classified as mixed-mode gamblers (MMGs; 17.1%), and the minority exclusively gambled online (2.7%). In addition, among those that gamble online, 20.4% engaged in some form of illegal or unregulated online gambling, representing approximately 6.2% of the Pennsylvania adult population. For the fourth year in a row, sports betting was the most popular online gambling format (7.90%), while lotteries were the most popular format for individuals to engage in offline gambling (48.70%).

Comparison of Gambling Modalities:

To help understand gambling behaviors, this report includes profiles of the three types of individuals who gamble: exclusively online gamblers (EONGs), exclusively offline gamblers (EOFGs), and those who gamble both offline and online or mixed-mode gamblers (MMGs).

Exclusively Online Gamblers (EONGs)

- Gambled on the least formats (approximately 1), significantly less than EOFGs and MMGs.
- Gambled about 2-3 times per month, significantly more often than EOFGs.
- Spent approximately 5 hours per month gambling on average, significantly more than EOFGs.
- Median monthly spending on gambling was \$20 per month, significantly less than MMGs.
- Predominantly men (significantly more than EOFGs), average age in mid-30s (significantly younger than EOFGs), and significantly higher proportion of Hispanic, Latino/a, or Spanish origin individuals than EOFGs.
- Most common motivation for gambling was to win money.
- Over half consumed alcohol, over 25% used products containing tobacco or nicotine, and almost 25% used cannabis in the previous year.
- Significantly more likely to be a problem or pathological gambler than EOFGs.

Exclusively Offline Gamblers (EOFGs)

- Gambled on approximately two formats, significantly more than EONGs, but significantly less than MMGs.
- Gambled the least frequently (about once per month), significantly less than both EONGs and MMGs.
- Spent the fewest hours gambling per month (around 2 on average), significantly fewer than EONGs and MMGs.
- Median spending was the least at \$10 per month, this was significantly less than MMGs.

- Slightly more women than men, average age was in their early 50s (significantly older than both EONGs and MMGs), and predominantly only white (significantly more than EOFGs and MMGs).
- Most common motivation for gambling was for enjoyment/excitement/fun/entertainment.
- Nearly 75% consumed alcohol, nearly 25% used products containing tobacco or nicotine, and almost 20% used cannabis in the previous year.
- Significantly less likely to score a 1 or higher on the Brief Problem Gambling Screen (BPGS) or be classified as a problem or pathological gamblers than EONGs and MMGs.

Mixed-Mode Gamblers (MMGs)

- Gambled on the greatest number of formats (approximately five formats), significantly more than both EONGs and EOFGs.
- Gambled the most frequently, at nearly once per week, significantly more frequent than EOFGs.
- Spent the greatest number of hours per month gambling, at over 10 hours per month on average, significantly more than EOFGs.
- Highest median monthly spending at \$50 per month, significantly more than EOFGs.
- Predominantly men (significantly more than EOFGs), average age is late 30s (significantly younger than EOFGs), significantly more individuals identified as black or African American only than EOFGs, and significantly higher proportion of Hispanic, Latino/a, or Spanish origin individuals than EOFGs.
- Most common motivation for gambling was for enjoyment/excitement/fun/entertainment.
- Over 75% consumed alcohol, nearly 50% used products containing tobacco or nicotine, and almost a third used cannabis in the previous year.
- Significantly more likely to score 1 or higher on the BPGS or be classified as a problem or pathological gambler than EOFGs.

IMPLICATIONS OF THE REPORT

This report reveals that online gambling prevalence continues to increase among Pennsylvania adults, while offline gambling has remained relatively stable. As in previous findings, a hierarchy of risk associated with gambling emerged: those who engaged in both offline and online gambling had the highest risk of problem gambling, while those who only gambled offline had the lowest risk. This finding suggests the need for targeted interventions focused on online gambling, ideally using online platforms, to educate audiences on the risks of gambling, including the increased risk of gambling across multiple formats.

BACKGROUND

Through Pennsylvania Act 42 of 2017, interactive gaming, also known as iGaming or online gambling, was legalized in Pennsylvania. As part of this legislation, it was stipulated that each year an assessment would be conducted to evaluate the impacts of legalized online gambling on the residents of Pennsylvania in terms of the prevalence rate of online gambling, the characteristics of online gamblers, and gambling problems associated with online gambling. This report presents a representative sampling of Pennsylvania adults describing their online gambling engagement and associated behaviors.

Gambling Revenues

During the 2023/2024 fiscal period, the Pennsylvania Gaming Control Board noted new records in online gambling revenues (Pennsylvania Gaming Control Board, 2017-2024; Figure 2), reaching over \$2.1 billion cumulatively, a nearly 5% increase in revenue over the 2022/2023 fiscal period, including nearly \$1.4 billion from iGaming (including interactive slots, interactive table games, and online poker), over \$732 million from online sports betting, and over \$19 million from fantasy sports (note: fantasy revenues do not differentiate between online and offline). The iLottery also saw increased revenue generation to over \$96 million, a 17% increase compared to the 2022/2023 fiscal year (Pennsylvania Lottery, 2017-2024).

iGaming Self-Exclusions

The Pennsylvania Gaming Control Board (PGCB) offers an iGaming-specific self-exclusion program, allowing individuals to voluntarily elect to abstain from participating in online gambling activities licensed under the PGCB. Those who enroll in this program do so with the understanding that if they violate their self-exclusion, any winnings will be confiscated. During the 2023/2024 fiscal period, the iGaming self-exclusion list saw 2,887 new enrollments, bringing the total number of enrollments to 6,792.

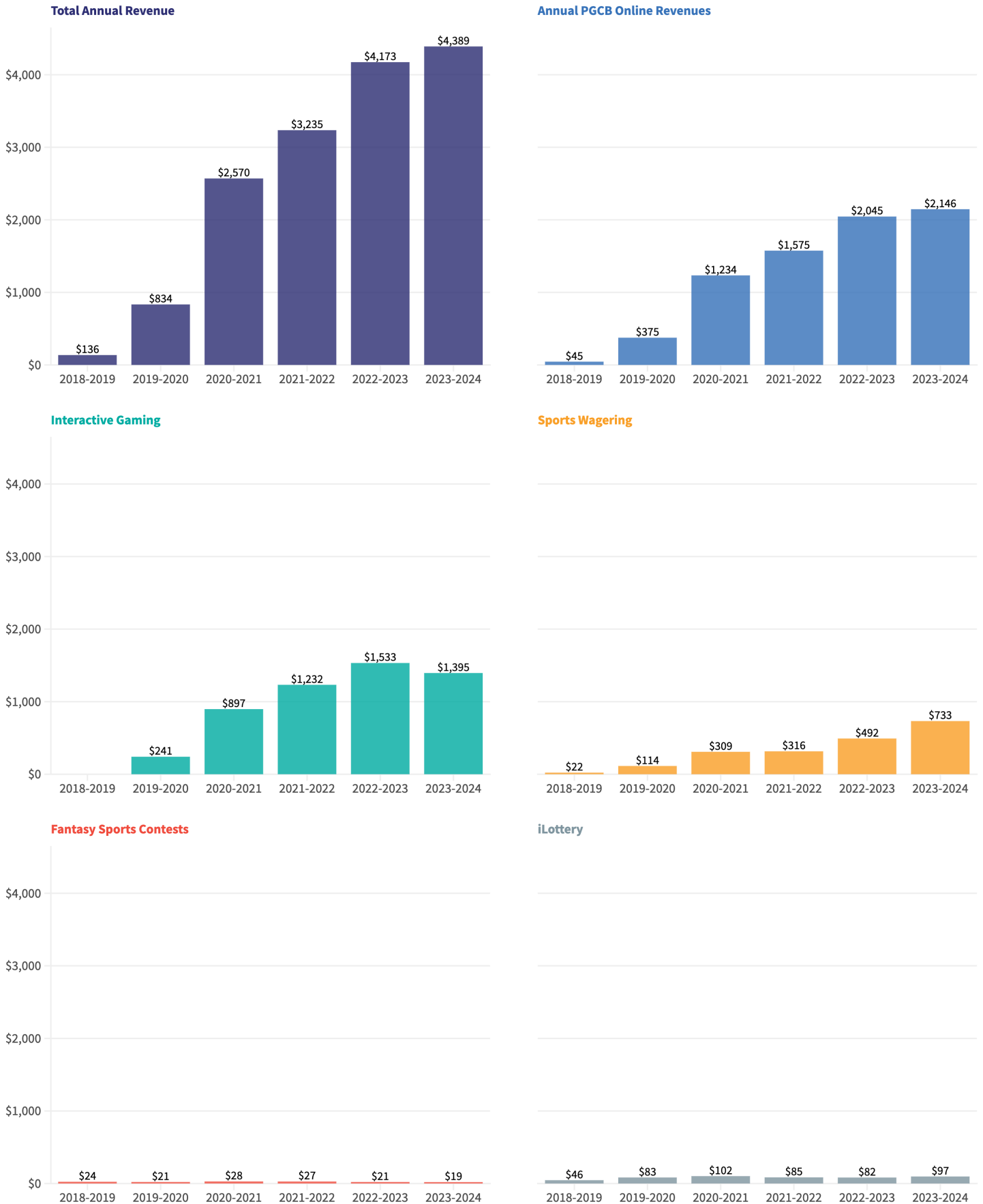
1-800-GAMBLER Helpline

In Pennsylvania, the Department of Drug and Alcohol Programs funds the 1-800-GAMBLER helpline. The helpline is operated by a non-profit group, the Council on Compulsive Gambling of Pennsylvania, Inc. (CCGP). The helpline is available for individuals to call, text, or use online chat for free, 24/7. Intake calls to the helpline remained fairly stable between July 2016 and June 2020; from that point, intake calls steadily increased until 2022/2023, with call volume dropping slightly in the 2023/2024 period (Figure 3; CCGP, 2017-2024). Calls that specifically indicated some form of online



Calls mentioning some form of online gambling as the most problematic form of gambling represented almost half of all intake calls.

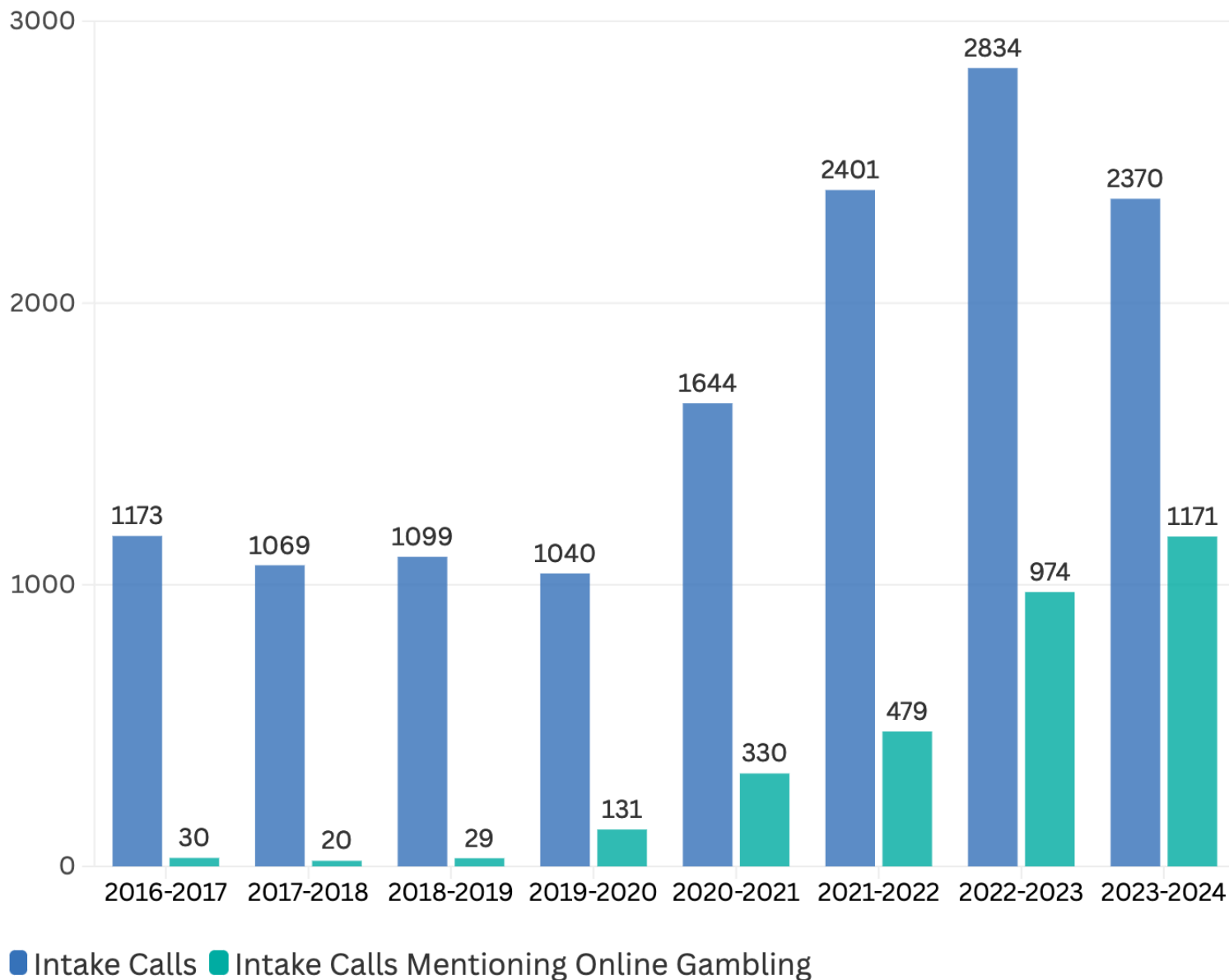
Figure 2. Legal online gambling revenues in Pennsylvania July 2018-June 2024.



\$ is in millions • Note: Fantasy sports contests include offline wagering. Online horse racing revenues unavailable and total revenues do not include revenue from online horse racing.

gambling as the most problematic gambling format for the individual began to increase during the 2019/2020 reporting period; approximately 2% of calls indicated online gambling between July 2016 and June 2019 and this increased to over 12% of total calls in the July 2019 to June 2020 period. In the 2023/2024 period, calls mentioning some form of online gambling as the most problematic form of gambling represented almost half of all intake calls (49.5%).

Figure 3. Annual calls to the 1-800-GAMBLER helpline in Pennsylvania.



Online Gambling Reports 2021-2023

The Interactive Gaming Assessment is conducted annually, with data collection first beginning in late 2020. In the previous three annual reports, covering the years 2020-2021, 2021-2022, and 2022-2023, gambling prevalence saw annual shifts. In the first annual report, among Pennsylvania adults, 11.1% reported engaging in online gambling and 44.8% reported engaging in offline gambling. Moving to the second report, online gambling participation was stable at 11.0%, while offline gambling jumped to 69.2%; however, this could be in part due to changes in survey instrumentation as well as reflect

the impact of gambling during COVID-19 lockdowns in Pennsylvania. In the third annual assessment, online gambling participation climbed to 16.0%, while offline gambling declined slightly to 62.4%. As the assessment has evolved annually, so too have our interpretations of the data. In 2023, instead of continuing to divide individuals into the groupings of offline gamblers and online gamblers, we instead opted to divide those who gamble into three groups based on the continued findings that the majority of online gamblers also gamble offline, to better assess any differences that may exist among those who only gamble online.

Throughout all three previous reports, when examining what gambling formats people tended to engage with the most, we found that lotteries and raffles in offline gambling tended to be the most popular, while in online gambling, sports betting was the most popular. In the third report, we were able to also look at other gambling behaviors, such as frequency of gambling, average monthly spending, and average hours spent gambling. In this report, we found a distinct pattern in which those who gambled both online and offline tended to gamble most frequently and spend the greatest number of hours and money on gambling per month; comparatively, those who gambled only offline tended to gamble the least frequently and spend the least amount of time and money on gambling per month.

In the first two reports, in which we previously compared offline gamblers to online gamblers, we found that demographically, the majority of online gamblers exhibited consistent characteristics: they were primarily employed male individuals in their mid to late 30s, of Caucasian ethnicity, residing in metropolitan areas, possessing a bachelor's degree or higher educational attainment, and enjoying a household income exceeding \$50,000. For the third report, though we did examine demographics of the three categories, our findings were largely consistent for demographics with both the online only and those who gambled both online and offline, such as being more likely to be younger and male. However, we did find that these individuals were less likely to be Caucasian than those who only gambled offline.

In the first two iterations of the report, the assessment of gambling problems was limited to those who gambled online only and was carried out using a screening measure (the Brief Problem Gambling Screen). In those reports, we found that more than a third of online gamblers scored 1 or higher, underlining the importance of addressing potential gambling-related issues within the online gambling population. In the third year of the assessment, we used the screen on any gamblers (regardless of their mode of gambling) who gambled at least once per month). In the third year, we found that there was a hierarchy, with those who gambled both online and offline being most likely to score 1 or higher on the BPGS and those who gambled only offline being the least likely to score 1 or higher on the BPGS.

This Year's Assessment: Year Four Assessment (2024)

For the fourth annual assessment, changes were made to both the contact and recruitment procedures as well as the survey. The first major change was made to the sampling of phone numbers; this year we opted to shift the dual sampling frame from 50% cellphones and 50% landlines to 80% cellphones and 20% landlines. This shift was made to reflect the decline in landlines and demographic differences in landline holders versus cellphone holders (landlines being underrepresented among younger adults; Kennedy et al., 2018; Ridenhour et al., 2016). This change did indeed lead to a younger sample than in prior years; even within this year's sample, those surveyed via cell phones were younger than those surveyed via landlines.

A second change involved the recruitment script for the survey; in prior years, the survey was introduced as a survey of Pennsylvania adults regarding interactive gaming or online gambling. This year, we conducted an experiment to compare responses to the survey using the prior scripting (i.e., referring to the survey as a survey of online gambling) versus introducing the survey as a survey of recreation and leisure activities. We found that the invitation to a survey on recreation and leisure increased cooperation, decreased refusals, and resulted in no differences in gambling behaviors or gambling problems compared to the online gambling invitation.

A third change was made in terms of the length of the survey; for half of the sample who engaged in gambling at least once per month or more, we used the problem gambling screen that has been utilized in the previous years of the Interactive Gaming Assessment. For the other half, we used a longer assessment of problem gambling. Through this manipulation, we tested the feasibility of using a full assessment of problem gambling to gather population prevalence of problem gambling for future iterations of the report. We found that a full assessment of problem gambling did not have any effect on participants' likelihood of completing the survey compared to the problem gambling screen used in prior years.

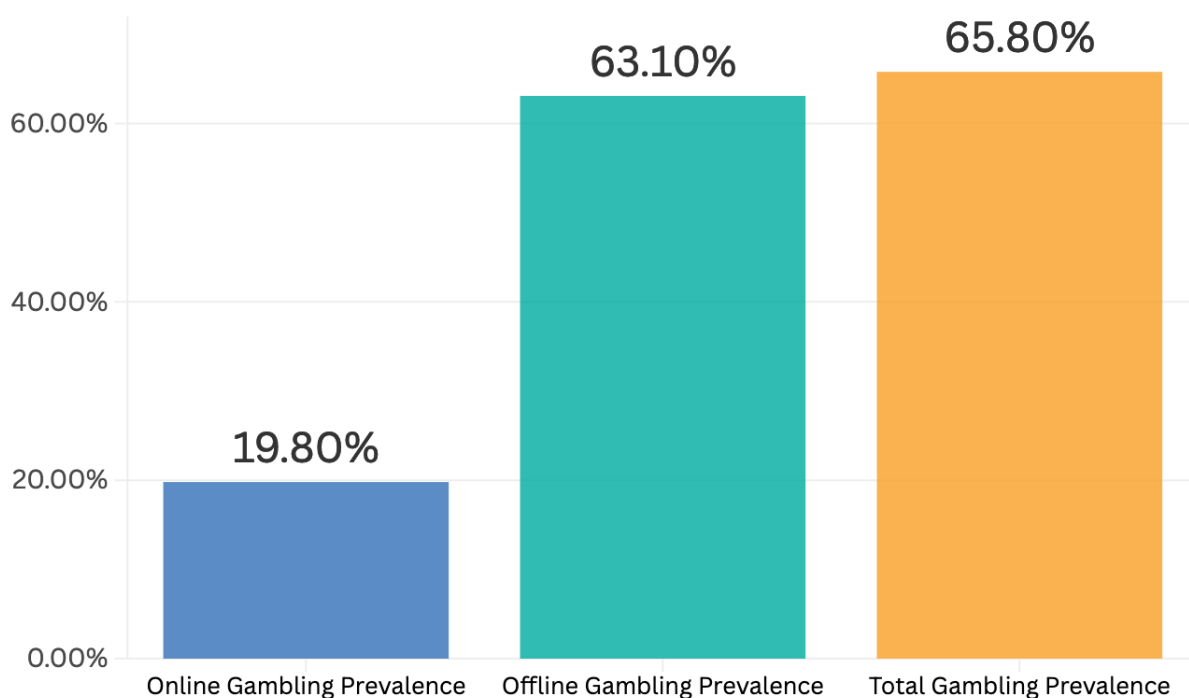
Finally, with a small sub-sample, we also explored the use of incentives in recruiting individuals to participate in the survey, specifically examining the impacts of offering a "pre-incentive" (mailing \$2 in cash to individuals with an invitation to participate) versus a "promised incentive" (informing people they will receive \$5 in e-gift cards if they completed the survey). We found that the use of pre-incentives was most effective, yielding the highest response, cooperation, and contact rates as well as the lowest refusal rates.

In terms of the survey instrument, this was largely kept the same as the third year of the report with some small modifications. In particular, as previously mentioned, there was the addition of the Problem and Pathological Measure (PPGM) to assess problem gambling in a subset of the sample. We also included sections on substance use and mental health. The modified survey was deployed to 22,000 landline phone numbers (20% of the total) and 88,000 cell phone numbers (80% of the total). The final sample included 1,413 completed surveys and 177 partial completes that were then weighted to represent adults aged 18 years of older across Pennsylvania. For more specific details on the methodology of the survey and its analysis for this report, please see Appendix A.

GAMBLING PREVALENCE

Among Pennsylvania residents aged 18 and older, approximately 65.8%, 95% CI¹ [63.4, 68.2], reported engaging in some form of gambling over the past 12 months. Among Pennsylvania adults, 19.8%, 95% CI [17.8, 21.8], of residents indicated they had gambled online; 2.7%, 95% CI [1.9, 3.5], of residents indicated they were exclusively online gamblers (EONGs). Offline (or land-based) gambling was the most popular mode of gambling, with 63.1% of adult residents, 95% CI [60.7, 65.5] engaging in offline gambling; approximately 46.0% [43.5, 48.5] of residents reported being exclusively offline gamblers (EOFGs). However, 17.1%, 95% CI [15.3, 19.0] indicated they engaged in both online and offline gambling – so called “mixed-mode” gamblers (MMGs).

Figure 4. Population prevalence of gambling among Pennsylvania adults.



Looking to which gambling formats individuals engage in the most, lottery and raffles continued to be the most popular offline gambling format, while sports betting continued to be the most popular online gambling format (Figure 5). Looking at the popularity of different gambling formats based on modality, we found several key differences:

1. More MMGs engaged in instant lottery than both EOFGs ($p < .01$) and EONGs ($p < .001$), also more EOFGs than EONGs engage in instant lottery ($p < .001$);
2. For lottery and raffles, both MMGs and EOFGs were more likely than EONGs to engage in lottery or raffles ($p < .001$);
3. MMGs were more likely to engage in games of skill than EOFGs ($p < .001$);

CI¹ = Confidence Intervals are a range of values that are thought to have a high chance of containing the true value are trying to be estimated. So, in this first instance, we are 95% confident that 63.4% to 68.2% of the entire adult population of Pennsylvania have gambled in the past year.

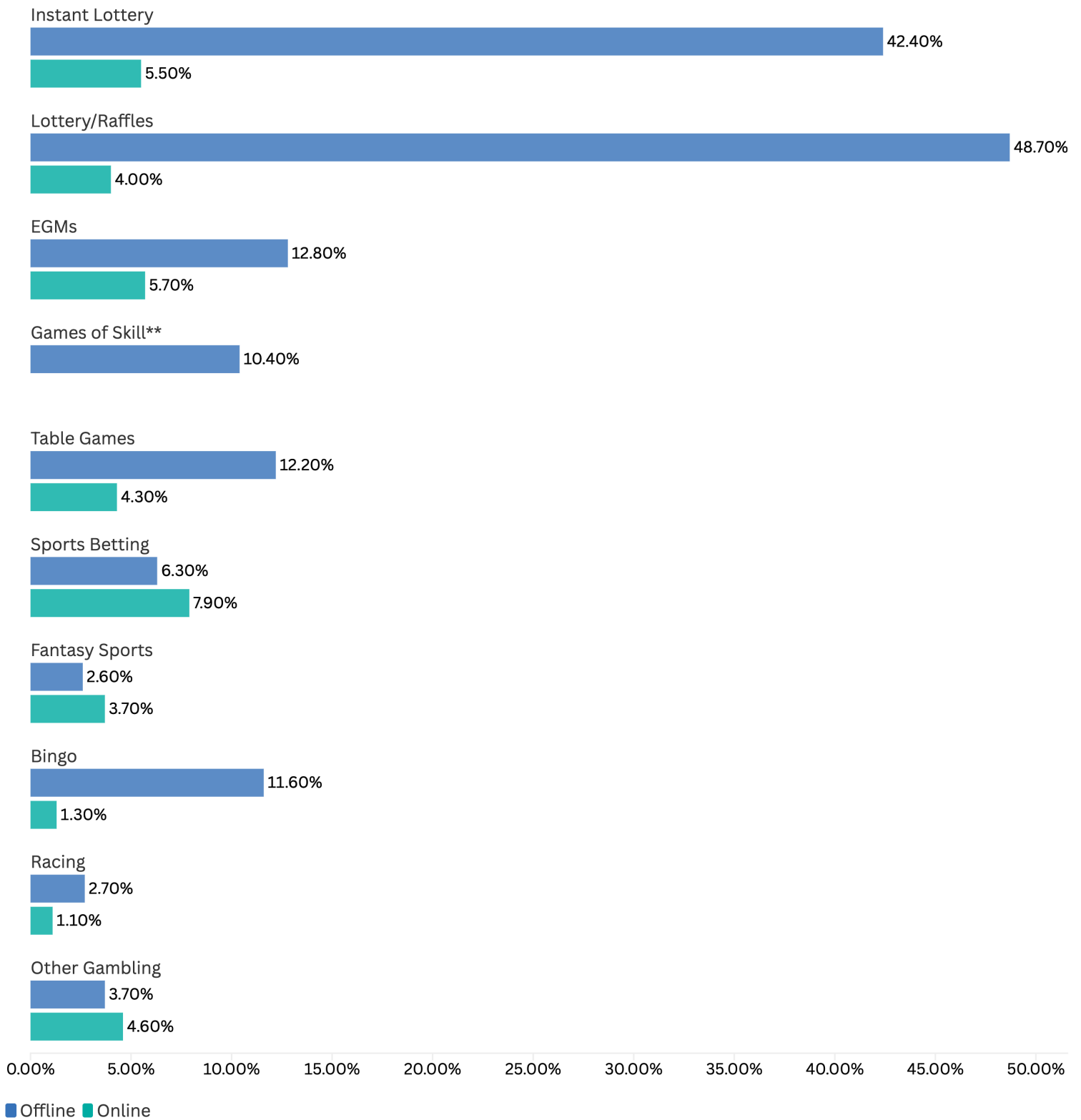
4. More MMGs than both EOFGs ($p < .001$) and EONGs ($p < .01$) engaged in EGM play;
5. MMGs were more likely than both EOFGs and EONGs to engage in table games ($p < .001$);
6. MMGs were more likely to bet on sports than both EOFGs and EONGs ($p < .001$);
7. MMGs were more likely than EOFGs ($p < .001$) and EONGs ($p < .01$) to engage in fantasy sports betting;
8. MMGs and EOFGs were more likely to have bet on bingo than EONGs ($p < .01$);
9. MMGs were more likely to bet on racing than EOFGs ($p < .001$); and,
10. EONGs and MMGs were more likely to engage in other forms of gambling than EOFGs ($p < .001$; Table 1).

Examining differences between gamblers' modalities, it was found that MMGs tended to gamble on the greatest number of formats ($M = 5.02$; $SD = 2.39$), followed by EOFGs ($M = 2.23$; $SD = 1.22$), and then EONGs ($M = 1.32$; $SD = 0.77$); these differences were significant with MMGs gambling on significantly more formats than both EONGs and EOFGs ($p < .001$) and EOFGs gambling on significantly more formats than EONGs ($p < .001$).

Looking at how frequently individuals tend to gamble, 17.0% of Pennsylvania adults indicated they gambled on some form of gambling once a week or more (Figure 6). Comparing how frequently individuals engaged in gambling, EOFGs reported the least frequent gambling, on average participating about once per month ($M = 2.03$; $SD = 1.42$). EONGs engaged in gambling slightly more frequently, at almost 2-3 times per month ($M = 2.75$; $SD = 1.93$). Finally, the most frequent gambling was found among those MMGs, with these individuals gambling almost once per week ($M = 3.22$; $SD = 1.83$). This difference was significant ($p < .001$), with MMGs ($p < .001$) and EONGs ($p < .01$), gambling more frequently than EOFGs.

Mixed-Mode Gamblers engaged in gambling on more formats than Exclusively Online Gamblers, and Exclusively Offline Gamblers.

Figure 5. Proportion of Pennsylvania adults engaging in each gambling format by modality.



**Games of skill as assessed in the survey are only available offline

17%

17.0% of Pennsylvania adults indicated they gambled on some form of gambling once a week or more.

Table 1. Comparison of the proportion of engagement in each gambling format by chosen gambling modality.

Format	Gambling Modality			
	EOFGs	EONGs	MMGs	<i>p</i>
Instant Lottery	66.0%	26.4%	77.9%	< .001
Lottery/Raffles	79.1%	18.4%	77.2%	< .001
Games of Skill ^a	11.9%	N/A	29.7%	< .001
EGMs	17.0%	13.4%	45.0%	< .001
Table Games	11.6%	8.8%	47.8%	< .001
Sports	8.0%	16.6%	50.2%	< .001
Fantasy Sports	2.7%	3.5%	23.9%	< .001
Bingo	19.3%	3.0%	19.8%	.026
Racing	3.5%	0%	11.8%	< .001
Other Gambling	4.5%	41.6%	25.2%	< .001

^aGames of skill as defined are not available online.

Mixed-Mode Gamblers spend the highest number of hours per month gambling, followed by Exclusively Online Gamblers, and then Exclusively Offline Gamblers spending the fewest hours per month gambling.

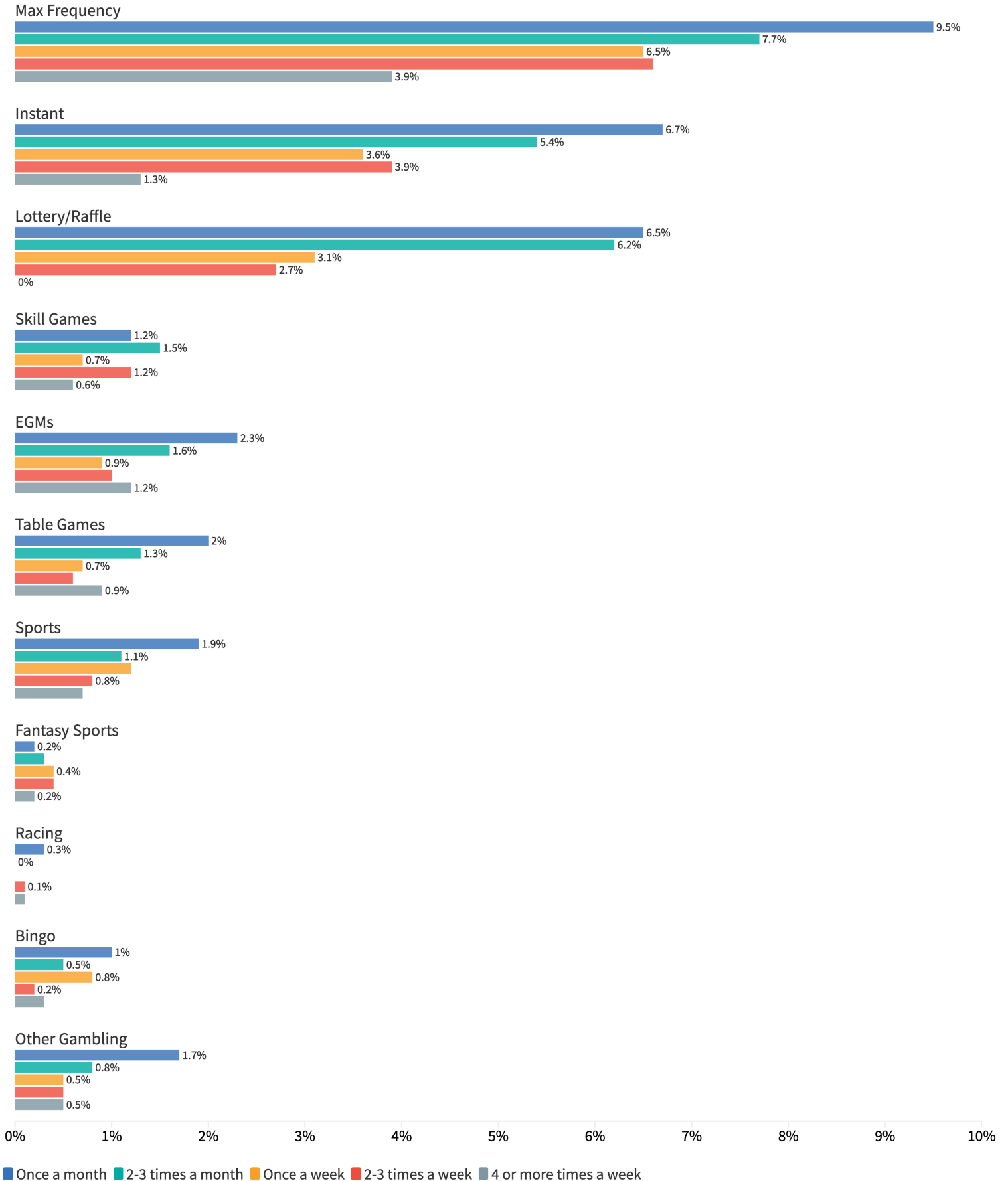
Following a similar pattern, EOFGs spent the fewest number of hours gambling per month, at 2.41 ($SD = 10.97$) hours, followed by EONGs at 5.10 ($SD = 9.01$) hours, and MMGs 10.26 ($SD = 29.68$) hours on per month average ; this was significantly different ($p < .001$), with EONGs and MMGs spending significantly more hours gambling per month than EOFGs ($p < .001$).

Average monthly spending was heavily skewed; however, median spending followed the same trend with the median spending of EOFGs being \$10, EONGs being \$20, and MMGs being \$50 . This difference in spending was also significant ($p < .001$), with MMGs spending more per month on gambling than both EOFGs ($p < .001$) and EONGs ($p < .01$).

For both MMGs and EONGs, we wanted to determine whether their engagement in online gambling was legal, or whether they had been participating in illegal (including underage and illegal forms of online gambling) or unregulated online gambling. The majority of online gamblers bet exclusively through legal providers, with 79.6% of online gamblers gambling only via legal providers and 20.4% of online gamblers engaging in some form of illegal or unregulated online gambling . Altogether, this represented approximately 6.2%, 95% CI [4.7, 7.6], of Pennsylvania adults engaging in some form of illegal or unregulated online gambling.

The median monthly spending on gambling was highest for Mixed-Mode Gamblers at \$50 per month and lowest for Exclusively Offline Gamblers at \$10 per month.

Figure 6. The proportion of Pennsylvania adults engaging in each gambling format monthly or greater.



DEMOGRAPHIC FEATURES OF PENNSYLVANIA GAMBLERS

Looking at demographic features of individuals based on modality, there were several key characteristics for each type. The average age of offline-exclusive gamblers was 53.55 ($SD = 17.38$). There was a slight majority of women among EOFGs (54.2%); the large majority were white (81.8%); and, identified as not being of Hispanic, Latino/a, or Spanish origin (94.3%). The average age of EONGs was 35.89 ($SD = 15.39$). Most identified as men (70.9%); white only (64.8%); and most identified as not being of Hispanic, Latino/a, or Spanish origin (83.2%). Finally, the average age of MMGs was 38.56 ($SD = 15.41$). Again, most identified as men (60.1%); the majority were white only (68.5%); and most identified as not being of Hispanic, Latino/a, or Spanish origin (88.8%). Tables 2 and 3 include a detailed breakdown of the demographic characteristics of gamblers by modality and additional demographic characteristics. Comparing these demographics, there were several notable differences: both EONGs and MMGs were significantly younger than EOFGs ($p < .001$), significantly more EONGs ($p < .01$) and MMGs ($p < .001$) identified as men than EOFGs, significantly more EOFGs were white only compared to both MMGs and EONGs ($p < .001$), significantly more MMGs were black or African American only than EOFGs, and significantly more EONGs and MMGs identified as being of Hispanic, Latino/a, or Spanish origin than EOFGs ($p < .001$).

Table 2. Demographic comparisons of Pennsylvania gamblers, based on gambling modality.

	Gambling Modality			Chi-Square	<i>p</i>
	EOFGs	EONGs	MMGs		
Age				154.42	< .001
18 to 19 years	1.8%	3.7%	3.9%		
20 to 24 years	3.7%	28.6%	15.5%		
25 to 29 years	6.0%	10.5%	15.6%		
30 to 34 years	4.1%	15.3%	14.4%		
35 to 39 years	6.5%	5.6%	7.8%		
40 to 44 years	7.7%	5.8%	9.1%		
45 to 49 years	6.8%	2.5%	9.1%		
50 to 54 years	9.9%	8.8%	7.2%		
55 to 59 years	11.2%	3.5%	3.6%		
60 to 64 years	10.8%	4.9%	5.1%		
65 to 69 years	9.8%	3.6%	2.9%		
70 to 74 years	8.0%	2.4%	1.4%		
75 to 79 years	4.0%	0%	1.0%		
80 to 84 years	2.8%	0%	0.3%		
85 years and over	3.1%	0%	0.9%		
Prefer not to answer	3.7%	4.9%	1.9%		
Gender^a				24.453	< .001
Man	45.4%	70.9%	60.1%		
Woman	54.2%	29.1%	38.8%		
Other gender identity	0.3%	0%	0.4%		
Prefer not to answer	0.1%	0%	0.8%		
Race^b				32.431	< .001
Race 2 or more	6.1%	0%	5.9%		
White only	81.8%	64.8%	68.5%		
Black or African American only	5.6%	14.4%	15.7%		
Asian only	2.1%	18.0%	5.1%		
American Indian or Native Alaskan only	0.4%	0%	0%		
Native Hawaiian or Pacific Islander only	0.1%	0%	0%		
Other only	2.5%	2.7%	4.0%		
None provided	1.3%	0%	0.8%		
Ethnicity				15.551	< .001
Not of Hispanic, Latino, or Spanish origin	94.3%	83.2%	88.8%		
Hispanic, Latino, or Spanish origin	5.2%	16.8%	10.8%		
Prefer not to answer	0.6%	0%	0.4%		

^aGender recoded to man = 1 and woman and other categories = 0 due to small cell size

^bRace recoded into 0 = non-white only, 1 = white only due to small cell size, and 2 = black or African American only

Table 3. Additional demographic features of Pennsylvania gamblers based on gambling modality.

	Gambling Modality		
	EOFGs	EONGs	MMGs
Marital Status			
Married or living with a partner	53.9%	24.4%	35.7%
Divorced	8.6%	7.0%	6.8%
Separated	1.2%	5.0%	0%
Widowed	6.0%	0%	1.0%
Single (never married)	23.0%	36.2%	44.9%
Missing/refused to answer	7.2%	27.5%	11.6%
Education			
Less than high school	2.8%	2.5%	1.6%
High school diploma or GED	19.2%	26.8%	19.1%
Some college	13.9%	4.6%	13.7%
Trade/Technical School	5.0%	0%	4.1%
Associate's degree	8.3%	5.2%	12.9%
Bachelor's degree	26.4%	26.3%	24.3%
Master's degree	12.9%	0%	10.9%
Professional degree beyond bachelors	1.9%	1.6%	0.6%
Doctorate	2.7%	5.6%	1.2%
Missing/refused to answer	6.7%	27.5%	11.6%
Employment			
Employed	56.8%	55.3%	68.2%
Homemaker	2.3%	0%	3.5%
Student	2.2%	3.4%	4.4%
Retired	24.7%	6.8%	5.4%
Out of work	2.3%	0%	0%
Unable to work	4.5%	7.0%	3.5%
Missing/refused to answer	7.2%	27.5%	11.6%
Income			
Less than \$10,000	3.3%	3.4%	4.7%
\$10,000-\$14,999	2.0%	3.6%	3.4%
\$15,000-\$24,999	5.0%	9.3%	5.3%
\$25,000-\$34,999	7.9%	6.0%	5.4%
\$35,000-\$49,999	8.6%	6.1%	7.0%
\$50,000-\$74,999	16.5%	9.3%	16.4%
\$75,000-\$99,999	10.7%	5.5%	10.9%
\$100,000-\$149,999	9.8%	4.9%	10.1%
\$150,000-\$199,999	4.0%	11.5%	4.3%
\$200,000-\$249,999	1.3%	0%	2.5%
\$250,000 or more	1.5%	0%	3.7%
Missing/Refused to Answer	29.3%	40.4%	26.2%
Sexuality			
Asexual	1.1%	0%	0%
Bisexual	2.8%	0%	3.9%
Gay/Lesbian	2.1%	5.1%	1.8%
Heterosexual/Straight	78.2%	65.8%	80.4%
Pansexual	0%	0%	0.7%
Other	2.5%	0%	0.3%
Missing/Refused to Answer	13.4%	29.1%	12.8%
Military Status			
Currently enlisted	0.2%	0%	2.0%
Veteran	7.7%	6.0%	6.1%
Neither	85.1%	72.5%	79.5%
Missing/Refused to Answer	7.0%	27.5%	12.4%

MOTIVATIONS AND CONTEXT

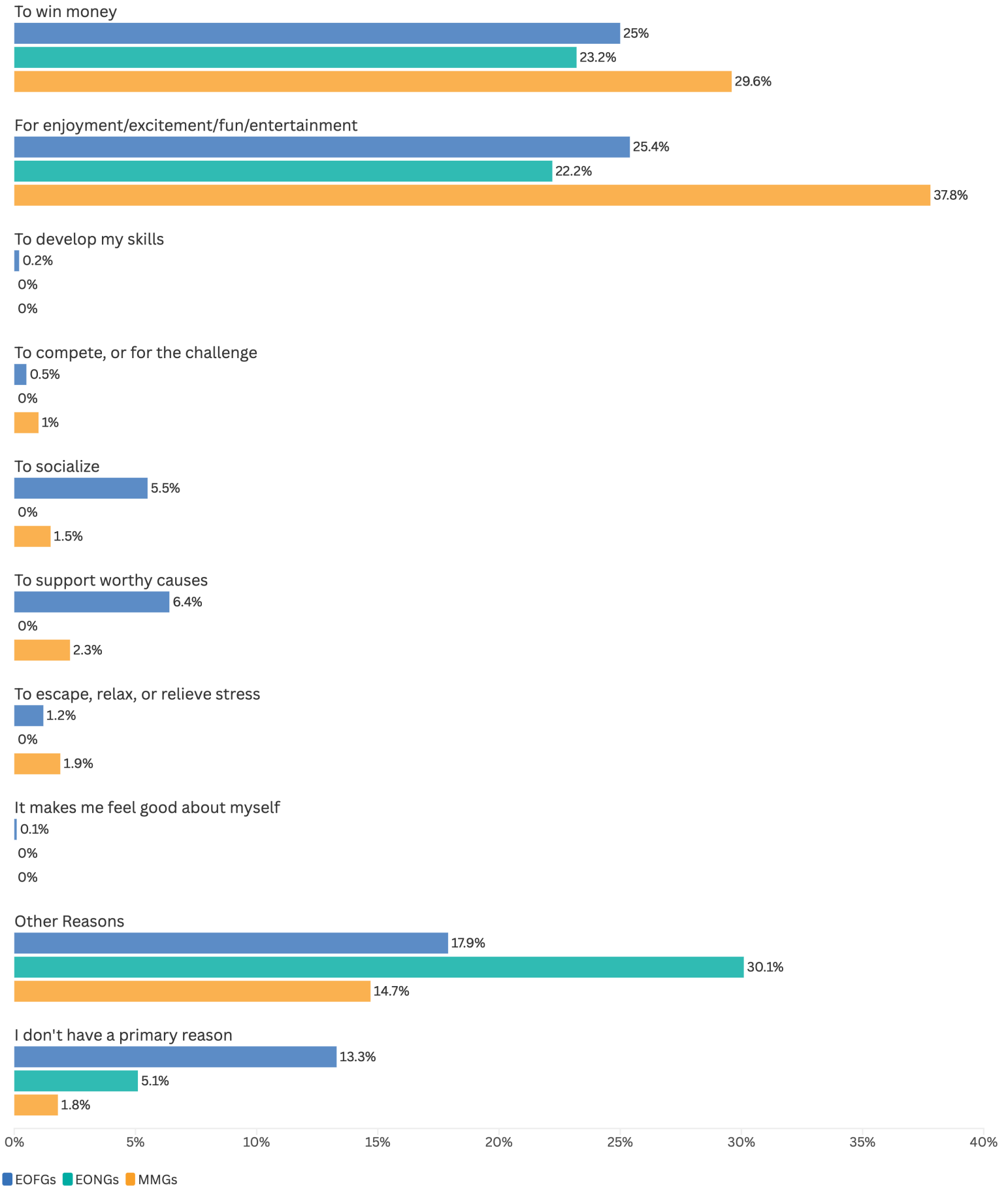
When asked about their primary motivation for engaging in gambling, the most common motivation for gamblers was for enjoyment, excitement, fun, or entertainment (see Figure 7). Comparing across modalities, EOFGs' and MMGs' most reported motivation was for enjoyment, excitement, fun, or entertainment, while for EONGs, it was to win money.

Regarding the social context of gambling, there was a fair mix of gambling alone and with friends. Among EOFGs, nearly half tended to typically gamble with family or friends (47.4%). Similarly, nearly half of MMGs tended to typically gamble with friends or family (41.1%), while EONGs tended to always gamble alone, with 40.6% of EONGs indicating that they always gambled alone. Comparing the social context, these differences were significant ($p < .001$), with EONGs tending to gamble less socially than both EOFGs ($p < .001$) and MMGs ($p < .01$), and MMGs tending to gamble slightly less socially than EOFGs ($p < .01$).

When asked about the importance of gambling as a leisure activity, across all gambler types, most individuals tended to not rate gambling as a very important leisure or recreational activity. However, there were subtle differences based on gambling modality. In particular, 62.7% of MMGs rated it as not at all important compared to 83.0% of EOFGs and 89.3% of EONGs. These differences were significant ($p < .001$), with MMGs tending to rate gambling as more important than both EONGs ($p < .01$) and EOFGs ($p < .001$). Concerning whether individuals were a member of any gambling rewards or loyalty programs, there was a significant difference based on gambling modality ($p < .001$). Specifically, more MMGs (26.2%) than both EOFGs (7.2%; $p < .001$) and EONGs (6.2%; $p < .05$) were current members.

The most common motivation for gamblers was for enjoyment/excitement/fun/entertainment.

Figure 7. Motivations for gambling based on gambling modality.



SUBSTANCE USE AND MENTAL HEALTH

Questions regarding substance use and mental health were new additions to the assessment this year. The additions of these questions helped us to understand if those who engaged in gambling may have also engaged in other risky health behaviors, including substance use.

Concerning alcohol consumption, 66.2% of Pennsylvania adults indicated having consumed alcohol at some point in the past year. Overall rates of consumption are not available to compare; however, recent assessments place at-risk problem drinking prevalence at 6.6% in Pennsylvania which is similar to the 7.1% of our sample that consumes alcohol 4 or more times per week (Commonwealth of Pennsylvania, 2023). Breaking down consumption by gambling modality, 53.7% of non-gamblers, 72.3% of EOFGs, 51.9% of EONGs, and 77.0% of MMGs had consumed alcohol in the past year. Comparing consumption among just those who had gambled over the previous year, this difference was significant ($p < .01$) with significantly more MMGs having consumed alcohol over the previous year compared to EOFGs ($p < .01$; Figure 8 includes the frequency of alcohol consumption).

Mixed-Mode Gamblers were more likely to have consumed alcohol in the past year than Exclusively Offline Gamblers.

Examining tobacco and nicotine use, including cigarettes, cigars, and/or e-cigarettes or vaping devices, we found that 25.5% have used some product containing tobacco or nicotine in the past year; this is higher than current estimates of Pennsylvania residents, which have current smokers at approximately 14.9% and e-cigarette use at 7.4% of the population (Commonwealth of Pennsylvania, 2023). Comparing the proportion of individuals that had used these products based on gambling status, we found that 18.4% of non-gamblers, 22.4% of EOFGs, 27.7% of EONGs, and 47.5% of MMGs had used these products in the previous year. Comparing use among only those who had gambled in the previous year, this difference was significant ($p < .001$); in particular, significantly more MMGs than EOFGs had used products containing tobacco or nicotine in the previous year ($p < .001$; Figure 9 includes the breakdown of frequency of use).

Mixed-Mode Gamblers were more likely to have used products containing tobacco or nicotine in the past year than Exclusively Offline Gamblers.

Figure 8. Frequency of alcohol consumption over the past year based on gambling mode.

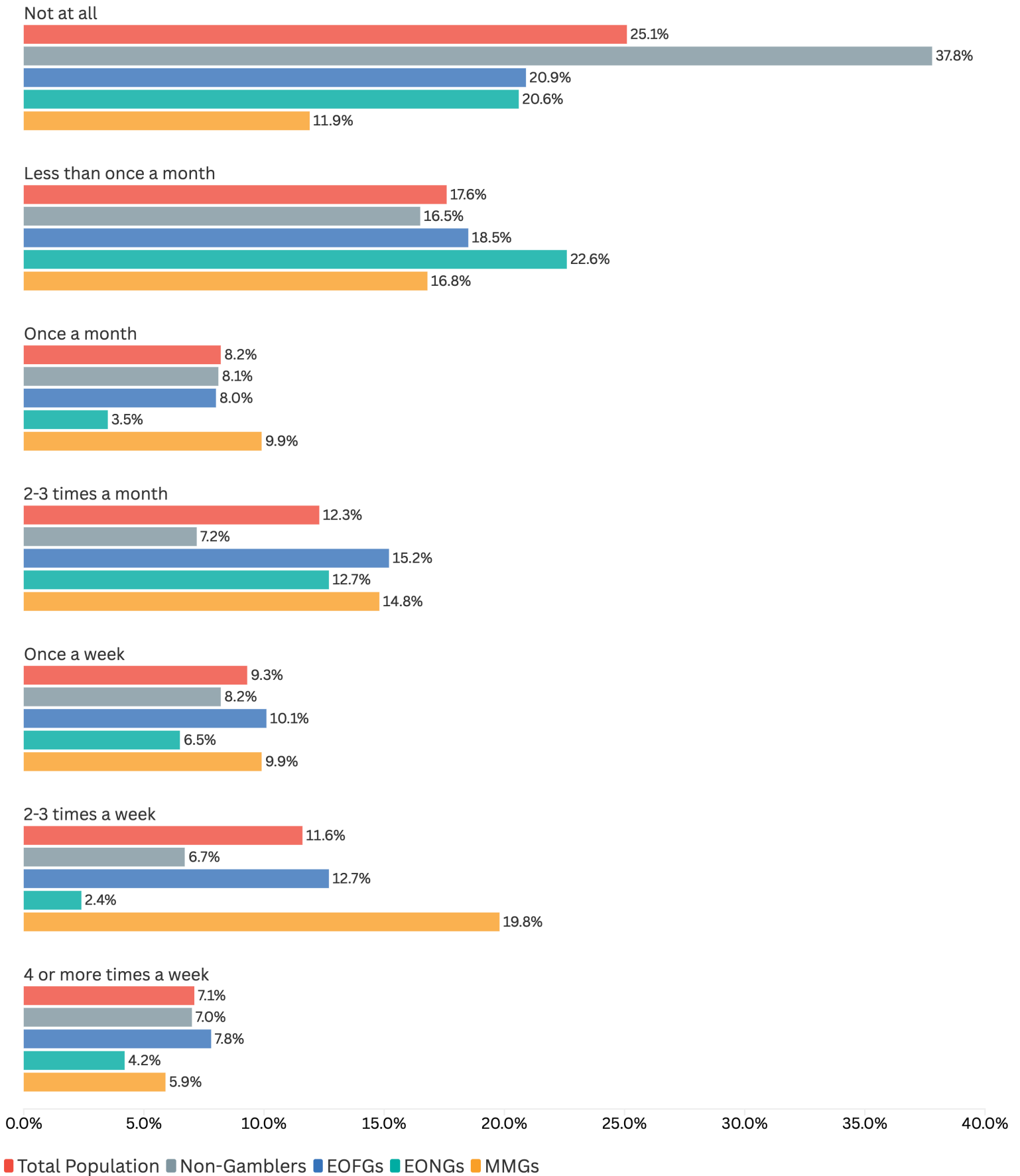
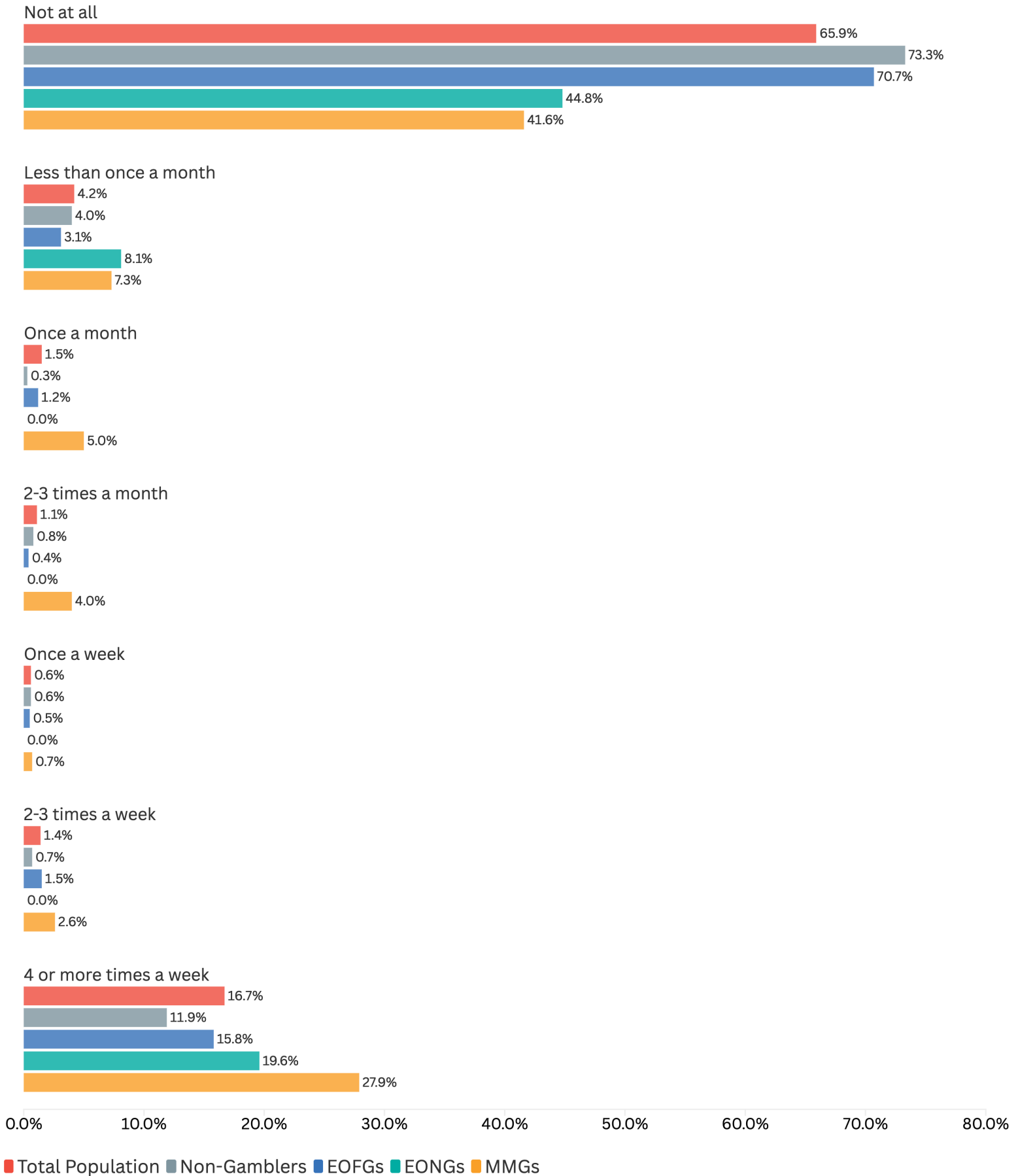


Figure 9. Frequency of tobacco and nicotine consumption over the past year based on gambling mode.



Looking at cannabis use, we found that 25.5% have used some cannabis product in the previous year; 13.9% of non-gamblers, 17.8% of EOFGs, 22.0% of EONGs, and 31.9% of MMGs. Comparing to data on recent (30-day) cannabis use in Pennsylvania, which found 9.4% of adults aged 26+ and 19.8% of adults aged 18-25 used cannabis products, our rates appear elevated, with 16.7% of the population with our sampling using cannabis products an average of 4 or more times per week (State Epidemiological Outcomes Workgroup, 2022). Comparing use among only those who had gambled in the previous year, this difference was significant ($p < .001$); in particular, significantly more MMGs than EOFGs used cannabis in the previous year ($p < .001$; Figure 10 includes the breakdown of frequency of use).

Mixed-Mode Gamblers were more likely to have used cannabis products in the past year than Exclusively Offline Gamblers.

Looking to mental health, 15.1% of Pennsylvania adults indicated having experienced symptoms of a mental health disorder over the past year. Comparing rates across gambling types, we found that approximately 14.0% of non-gamblers, 15.8% of EOFGs, 11.6% of EONGs, and 16.2% of MMGs had experienced symptoms of a mental health disorder over the previous year, with no significant differences based on mode of gambling. The most commonly reported mental health disorders were depression and anxiety across all gambling modes (Figure 11).

Exclusively Offline Gamblers, Exclusively Online Gamblers, and Mixed-Mode Gamblers were all equally as likely to have experienced symptoms of a mental health disorder over the previous year.

Figure 10. Frequency of cannabis consumption over the past year based on gambling mode.

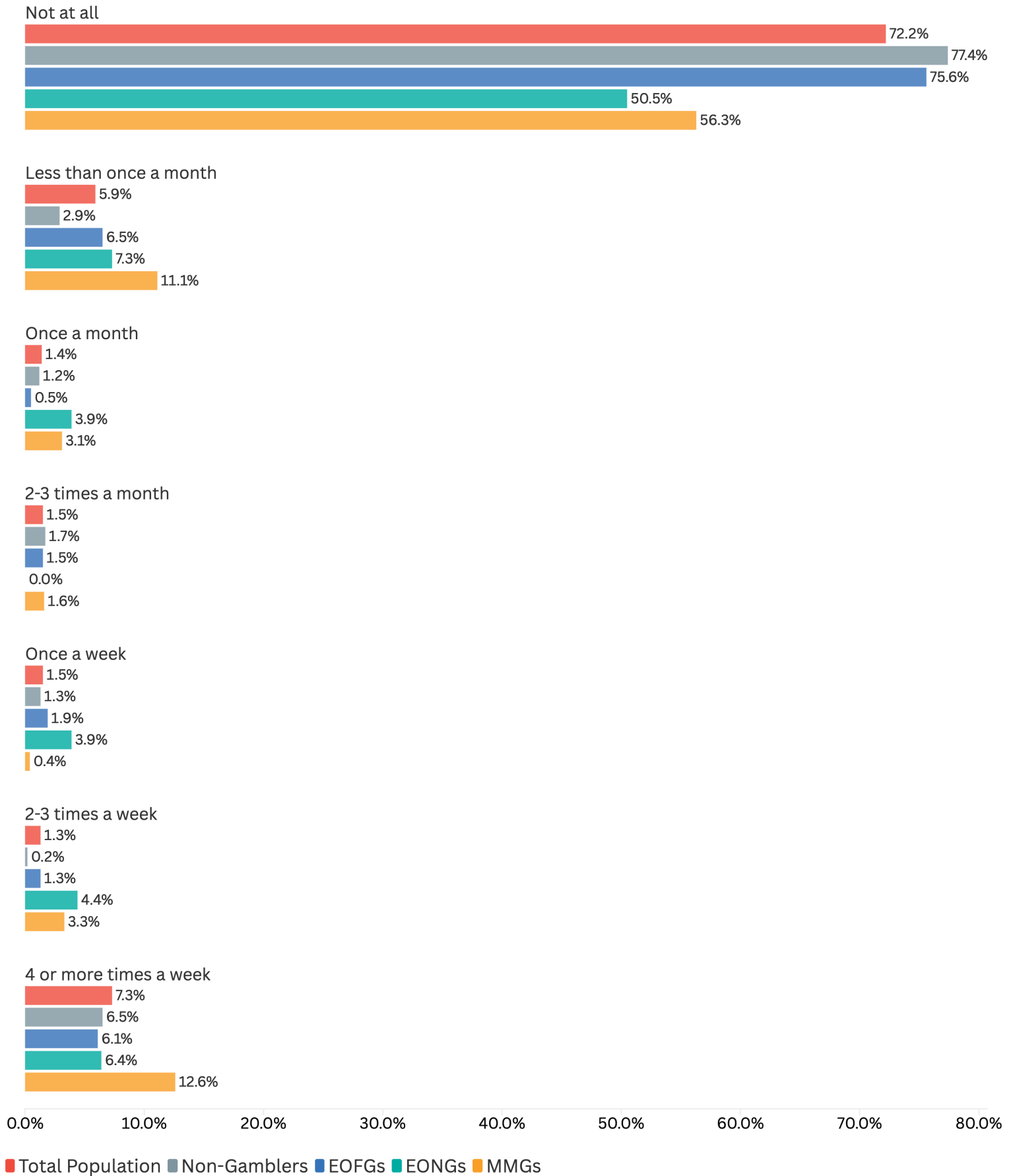
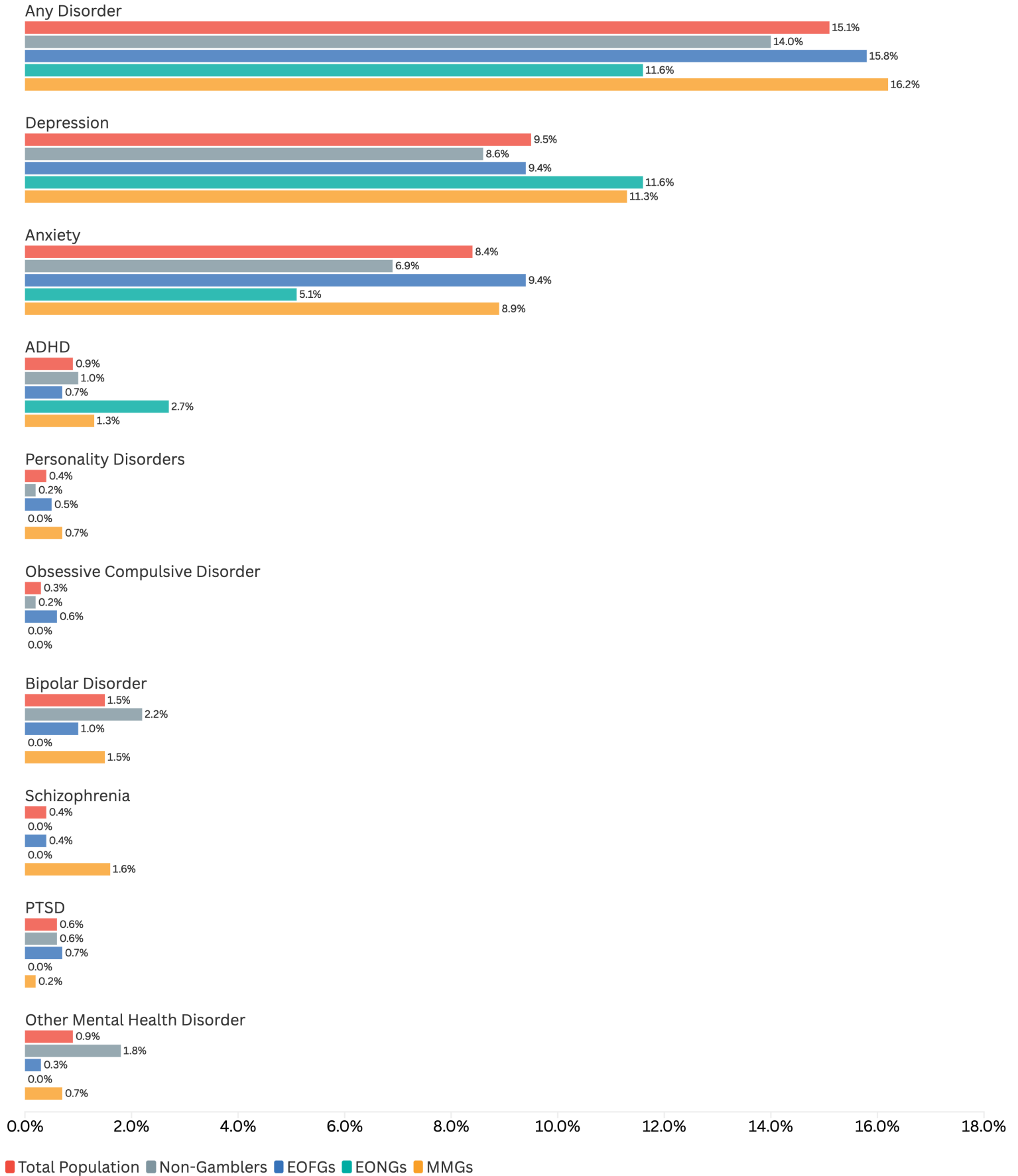


Figure 11. The proportion of individuals that indicate having experienced symptoms of a mental health disorder based on gambling modality.



PROBLEM GAMBLING AND GAMBLING-RELATED PROBLEMS

With this year's survey, those who indicated gambling at least once per month (approximately 34.2% of individuals), were divided into one of two groups: half of these individuals received the Brief Problem Gambling Screen (BPGS; Volberg & Williams, 2011), a screen for potential problem gambling that has been used in all prior iterations of the report, and the other half received the Problem and Pathological Gambling Measure (PPGM; Williams & Volberg 2010, 2014), a full assessment of problem gambling.

Within those who were asked questions from the BPGS, 15.4% of EOFGs ($n = 22$), 35.3% of EONGs ($n = 3$), and 43.4% of MMGs ($n = 34$) who gambled at least once per month presented with at least one potential problem gambling indicator according to the BPGS. This difference was significant ($p < .001$), in particular, MMGs were more likely to score one or higher than EOFGs ($p < .001$). Due to small sample sizes, these results should be interpreted with caution.

Using the PPGM, individuals were classified as recreational, at-risk, problem, or pathological gamblers. Among EOFGs who gambled at least once per month, we found 88.7% to be recreational gamblers ($n = 124$), 8.1% to be at-risk gamblers ($n = 11$), 0.5% to be problem gamblers ($n = 1$), and 2.6% to be pathological gamblers ($n = 4$). Among EONGs, 63.1% were recreational gamblers ($n = 5$) and 36.9% were pathological gamblers ($n = 3$). Finally, among MMGs, 60.1% were recreational gamblers ($n = 54$), 27.0% were at-risk gamblers ($n = 24$), 6.1% were problem gamblers ($n = 5$), and 6.8% were pathological gamblers ($n = 6.8$). As with the BPGS results, due to the small number of EONGs represented in these analyses, results should be interpreted with caution; in particular, the proportion of EONGs identified as pathological gamblers. These distributions were significantly different ($p < .001$). MMGs ($p < .001$) and EONGs ($p < .05$) were more likely to be classified as problem or pathological gamblers than EOFGs.

Comparing the results of the two assessments, approximately 8.7% of the adult population of Pennsylvania scored 1 or higher on the BPGS versus 7.8% classified as either an at-risk, problem, or pathological gambler according to the PPGM. Taken together, these results place the potential population prevalence of at-risk or problem gambling in the range of 7.8-8.7%.

Examining self-reported calls to 1-800-GAMBLER, approximately 1.8% of residents had ever made a call to the helpline; 0.6% of residents' calls were for oneself and 1.2% of residents' calls were regarding someone else.

The potential population prevalence of at-risk or problem gambling among Pennsylvania adults is likely in the range of 7.8-8.7%.

SUMMARY AND RECOMMENDATIONS

This report detailed the results of the fourth year of the interactive gaming assessment, undertaken to best understand the impacts of the legalization of online gambling in the state of Pennsylvania. This year's survey included several significant changes to the assessment concerning methodology, which have been detailed throughout.

This year, the prevalence of online gambling continued to increase, now up to nearly 20%, compared to 16% in the third year of the assessment (Sternier et al., 2023) and 11% in both the first (Russell, et al., 2023; Sternier, et al., 2021) and second (Russell et al., 2024; Sternier et al., 2022) year's assessments. Comparatively, offline gambling increased only slightly, up to 63.1% from 62.4% in the third report. Overall, these increases only represented a minor increase in gambling overall, up to 65.8% of Pennsylvania adults reported gambling compared to 65.5% in the third report. Comparing these rates to neighboring New Jersey with more established gambling provision, we found that while a greater a proportion of Pennsylvania adults engage in gambling (65.8% versus 61%; Nower et al., 2023), the distribution of gambler types does differ significantly with respect to those who engaged in online gambling. In New Jersey, 49% of all gamblers exclusively gamble offline, compared to 69.9% in Pennsylvania. However, this figure is likely influenced by the timing of data collection during the COVID-19 pandemic shutdowns (Nower et al., 2023), as well as the differing distributions of casino-style gambling. New Jersey represents more of a destination market, while Pennsylvania has casino-style gambling more widely distributed across the state.

We also found a rise in illegal or unregulated online gambling, with now up to 6.2% of Pennsylvania adults participating in either underage or some form of online gambling that is not currently licensed or regulated in Pennsylvania. This increase may be in part due to consumers' lack of understanding which types of online gambling is legal. In Pennsylvania, gambling is regulated by multiple agencies (i.e., Pennsylvania Gaming Control Board, Pennsylvania Lottery, and Pennsylvania State Horse Racing Commission), leading to a lack of consistent practices of labeling legal online sites. In addition, many offshore gambling websites operate in a legal "gray" area, advertising themselves as completely legal for Pennsylvania residents to gamble on with advertisements featured across various online platforms and social media.

As with the last report, due to the finding that most individuals that gamble online also gamble offline, we elected to classify individuals that gamble into one of three designations: Exclusively Offline Gamblers (EOFGs), Exclusively Online Gamblers (EONGs), and Mixed-Mode Gamblers (MMGs).

1.8%

1.8% of Pennsylvania adults made a call to the 1-800-GAMBLER helpline over the past year.

Exclusively Online Gamblers (EONGs)

This group was the smallest, with the minority of online gamblers only gambling online. Within this group, gambling behaviors were in the middle of the pack. EONGs tended to gamble on fewer formats than both MMGs and EOFGs. They spent significantly more hours gambling per month and gambled significantly more often than EOFGs. Their monthly spending on gambling was significantly less than MMGs. Demographically, this group was significantly younger than EOFGs, and this group had significantly more men than EOFGs. This group was less likely to be white-only than EOFGs and significantly more likely to indicate being of Hispanic, Latino/a, or Spanish origin. There was significantly less substance use in this group than MMGs, with EOFGs being less likely to have consumed alcohol, cannabis, or products containing tobacco or nicotine in the past year. Examining the results from the BPGS and PPGM conditions, we found that more of these individuals scored 1 or higher on the BPGS, though this was not significant. In the PPGM condition, we did find that they were significantly more likely to be problem or pathological gamblers than EOFGs.

Exclusively Offline Gamblers (EOFGs)

As with last year, this group represented the majority of gamblers. The gambling behaviors of this group were largely the lowest risk. Though they gambled on more formats than EONGs, they gambled on less formats than MMGs. They gambled statistically less frequently and spent fewer hours gambling per month than both EONGs and MMGs. Their average monthly spending on gambling was significantly lower than MMGs. Demographically, this group was the oldest, and this group had the greatest proportion of women. This group was the least racially diverse, with the majority identifying as only being white. There was significantly less substance use in this group than MMGs, with EOFGs being less likely to have consumed alcohol, cannabis, or products containing tobacco or nicotine in the previous year. Looking at the results from both of our problem assessment groups, we found EOFGs to be those least likely to score 1 or higher on the BPGS and least likely to be classified as a problem or pathological gambler.

Mixed-Mode Gamblers (MMGs)

This group represented the highest risk group. They engaged in gambling on the greatest number of formats, significantly more than both EONGs and EOFGs. They spent significantly more hours gambling per month and gambled more frequently than EOFGs. They reported the highest monthly spending, which was significantly more than EOFGs. Demographically, this group was also significantly younger than EOFGs and predominantly men (significantly more than EOFGs). This group was significantly less white than EOFGs and contained significantly more individuals that identified as black or African American only than EOFGs, and had a significantly higher proportion of Hispanic, Latino/a, or Spanish origin individuals than EOFGs. Substance use was the greatest in this group, with significantly more MMGs than EOFGs having consumed alcohol, cannabis, or products containing tobacco or nicotine in the previous year. Examining the results of the problem assessments, in both conditions, we found these individuals to be most likely to fall into the highest risk categories. MMGs were significantly more likely to score 1 or higher on the BPGS or be classified as a problem or pathological gambler compared to EOFGs.

As with the previous report, it was evident throughout this report that MMGs are at an enhanced risk of problem gambling. These findings are similar to New Jersey (Nower et al., 2023), where a clear hierarchy was found with EOFGs having the lowest prevalence of probable gambling disorder (1.1%), followed by EONGs (11.3%), and MMGs with the greatest proportion of probable disorder (19.9%). This finding underscores the risk of gambling on more formats. We estimated at-risk to problem gambling to be somewhere around 7.8-8.7% among Pennsylvania adults. This estimate of overall at-risk or problem gambling were similar to findings from Massachusetts where it is estimated that 1.4% of the population aged 18 and over were problem gamblers and an additional 8.5% were at-risk gamblers (Volberg et al., 2023).

Applications to Practice and Policy

Looking to practice, there is clear enhanced risk for problem gambling behaviors among those engaging in online gambling, in particular for those who gamble both online and offline. Messaging should be clear regarding the enhanced risk that individuals may incur from engaging in mixed-mode gambling, and even just from gambling on multiple formats. Efforts should be made to find ways to target younger individuals that these products appeal to most, ideally through online platforms. Special efforts should be made to target this messaging to those who identify as Black or African American and/or those who identify as being of Hispanic, Latino/a, or Spanish origin, as these populations tend to engage in online gambling more than white populations and may be at higher risk of problem gambling behaviors. Prevention and educational efforts should include coordination with key mental and behavioral health stakeholders within the community to encourage screening for gambling problems and referrals to community resources such as the 1-800-GAMBLER helpline and trained gambling treatment providers through the Single County Authorities. Considering screening practices, we would recommend being clear in the definition of gambling (including the full range of potential gambling activities that is flexible to account for new and emerging forms of gambling), so that individuals are not mistakenly screened out. This recommendation extends to problem gambling prevention, where messaging should be clear in defining gambling to middle and high school youth.

On a policy level, one key recommendation is that Pennsylvania legislators should seek to work to encourage collaborative oversight and standards regarding online gambling. Illegal and unregulated online gambling is increasingly prevalent, and due to no central oversight, it makes sourcing information regarding legal gambling options for consumers all the more difficult. We recommend unified advertising standards, that include responsible gambling messaging including the 1-800-GAMBLER helpline and a clear identifier for legal online gambling on sites for Pennsylvania residents that would be consistent across products for consumers to easily recognize. The PGCB currently requires all its licensed online operators to display a 'Licensed and Regulated' logo on their websites (see Figure 12). However, lottery and horse racing do not follow these same standards. Implementing a singular badge across all licensed online formats would help establish this consistency. While enforcement of illegal and unregulated gambling is not common, these forms often do come with enhanced risks to the gambler. Gambling through legal means can mitigate some of the risks that are associated with online gambling.

Figure 12. Licensed and regulated logo that is required for all operators licensed under the PGCB.



Future Directions

Based on the results of the experimental manipulations within this year’s survey and procedure, there are several changes we plan to implement moving forward. First, we will continue using a dual sampling frame with 80% cell phones and 20% landlines (as compared to prior years that had 50% of each type of phone). This change in sampling frame brought in a higher proportion of younger participants than previous years, increasing our accuracy of population estimates associated with online gambling prevalence. Second, by introducing the survey as recreation and leisure versus online gambling, respondents were more likely to agree to take the survey and less likely to refuse the survey compared to introducing it as an online gambling survey; we will continue to use this description to introduce the survey. Third, regarding the impacts of using the PPGM versus the BPGS on the length of the survey, we found no significant difference in response rates. Moving forward, we will be including the updated version of the PPGM, the Problem Gambling Measure (PGM; Gooding et al., 2024) in order to obtain population prevalence of problem gambling. Finally, due to its significant impact on sampling success, we will use and continue to investigate the use of pre-incentives to increase the response rate of our sample.

Through future assessments, we will continue to monitor the prevalence of online gambling in the state of Pennsylvania. With the inclusion of an assessment of problem gambling for all gamblers we also hope to better examine contributors to problem gambling in Pennsylvania.

APPENDIX A: METHODOLOGY

A dual frame random digit dial (DFRDD), including a combination of 20% landline and 80% cellular random digit dial (RDD) samples, was used to represent adults aged 18 years or older across Pennsylvania who have access to either a landline or cellular telephone. We used a total active block measurement of size stratification in which the sample was distributed by county in proportion to the total eligible blocks in the exchanges assigned to that county. Samples were drawn six times over the course of the study period.

RDD Landline Sample Methodology

Twenty percent of the sample was generated using a directory-list assisted database of “active” or “working” blocks in which each block is a set of 100 contiguous numbers identified by the first two digits of the last four digits of a telephone number (i.e., for the telephone number 814-777-2333, “23” is the 2-digit block). A block (area code + exchange + 2-digit block number) is termed to be working if three or more listed telephone numbers are found in that block. Numbers for the landline sample were drawn with equal probabilities from working blocks. Then, these numbers were screened by the sampling company and removed if they were identified as disconnected.

A total of 22,000 landline numbers were sampled with 13,417 remaining following sampling screening. Landline samples were drawn four times over the course of data collection. Table 4 details the landline samples drawn.

Table 4. Landline Numbers Selected, Screened, and Included in the Sample

	Landline		
	Draw	Disconnected	Included
September	10,000	3,177	6,823
October	4,000	1,321	2,679
February	4,000	2,032	1,968
March	4,000	2,053	1,947
Total	22,000	8,583	13,417

To better manage the sampling frame and close out numbers with final dispositions faster, smaller batches of landlines were uploaded to the calling portal throughout the year. In total, 11,969 landline numbers were uploaded to the calling portal across 12 batches ranging from 200 to 1,500 landlines.

RDD Cell Phone Sample Methodology

Eighty percent of the sample was drawn through systematic sampling from dedicated wireless blocks. Like the landline sample, numbers for the cell phone sample were drawn with equal probabilities from working blocks. The RDD cell sample then had the activity code appended to denote how long numbers have been active or inactive. Numbers that had been inactive for three months or more at the time of the sample drawing were excluded as inactive by the sampling company.

A total of 88,000 cell phone numbers were sampled with 51,168 remaining after removing inactive numbers. Samples were drawn six times over the course of data collection. Table 5 details the samples drawn.

To better manage the sampling frame and close out numbers with final dispositions faster, smaller batches of cell phones were uploaded to the calling portal throughout the year. In total, 48,542 cell phone numbers were uploaded to the calling portal across 44 batches ranging from 224 to 3,000 cell phones.

Table 5. Cell Phone Numbers Selected, Screened, and Included in the Sample

	Cell Phone		
	Draw	Inactive	Included
September	10,000	3,086	6,914
October	16,000	4,900	11,100
November	20,000	7,029	12,971
January	10,000	3,500	6,500
February	16,000	5,660	10,340
March	16,000	6,157	9,843
Total	88,000	30,332	51,168

Contact Procedures

Calls were staggered over days of the week and times of day to maximize the chance of contact with potential respondents. Apart from numbers that were able to be assigned a final disposition on the first or second call (e.g., phone number disconnected on first call, participant completed survey on second call), all numbers were attempted a minimum of three times, once during each calling period (i.e., weekday day from 10 am and 5 pm, weekday evening from 5 to 9 pm, and weekends from 10 am to 9 pm) with maximum call attempts capped at 6 calls for cell phones and 8 calls for landlines. Participants could receive additional call attempts if they requested additional call backs. Call attempts with no answer or that were not diverted to an answering device were allowed to ring between 7 and 10 times. A message was left on answering devices providing the name of the interviewer calling, the reason for the call, and a number for the participant to call back. If potential participants called back or texted and indicated that they did not wish to be contacted, calls to their number were ended.

Landline Sampling Frame and Selection

Approximately 80% of calls to landline numbers occurred on weekday evenings or weekends, and 20% of calls occurred on weekday days. For the eight calls made to each landline this year, this meant that two calls were made during the weekday day period, and the other six calls were made during either the weekday evening or the weekend time periods. The first three calls were each made during a different time period in no particular order, then the next five calls were made.

Non-working or unassigned numbers, modem and fax, and business numbers were screened on each call attempt and removed. Individuals who were deemed mentally or physically unfit to participant or

did not speak English were also screened out of the sample. All remaining numbers were presumed to be households with someone aged 18 years or older qualified to complete the interview, and, as such, continued to receive up to eight calls. One eligible respondent (aged 18 or over) from the household was randomly selected per household to be interviewed using the most recent birthday method. The anticipated response rate was 10%.

Cell Phone Sampling Frame and Selection

Cell phones were called approximately equal times in each of the three time periods: weekdays days, weekday evenings, and weekends. For the six calls made to each cell phone this year, this meant two calls were made in each of the time periods. The first three calls were each made during a different time period in no particular order, then the next three calls were made.

Non-working or unassigned numbers and business-only cell phone numbers were screened on each call attempt and removed. When individuals answered cell phone numbers, a screening question was asked to ensure that they were over 18 years old and that they were residents of Pennsylvania. Individuals who were under 18, not living in Pennsylvania, deemed mentally or physically unfit to participant, or did not speak English were screened out of the sample. The anticipated response rate was 10%.

Data Collection and Sample

Data collection began in September 2023 and continued through April 2024 with 248,096 calls made to 60,511 numbers (Landline = 11,969; Cell Phone = 48,542). An average of 3.761 ($SD = 2.898$) calls were made to landline numbers and 4.184 ($SD = 1.803$) calls were made to cell phone numbers.

Call Dispositions and Response Rates

Each number in the sample was assigned a final disposition code to indicate the result of calling the number. Dispositions, consistent with American Association for Public Opinion Research (AAPOR, 2023), were assigned after each call attempt. Dispositions and final assignment rules are detailed in Table 6.

The resolution rate (i.e., percentage of numbers in the total sample for which eligibility has been determined) was calculated for landline and cell phones separately using the following equation: $((ELIG + INELIG) / (ELIG + INELIG + UNKELIG)) * 100$. Resolution rates were 9.7% and 11.8% for landlines and cell phones respectively.

Response rates (i.e., contact, cooperation, refusal, and response rate) were calculated using the AAPOR survey rate calculator 5.1 (2023) for RDD. Final dispositions and response rates are detailed in Table 7. In comparison, other DFRDD studies conducted in Pennsylvania since 2020, reported response rates of less than 1% (Catt & Hroncich, 2020) and 1-4% (Collins et al., 2020). Similarly, a recent national study reported a response rate of 6% (Ferguson et al., 2022).

Research by the Pew Research Center indicates that response rates for all telephone-based surveys have declined, and response rates are generally lower for telephone surveys than for surveys conducted in

person (Pew Research Center, 2012). Federal surveys have similarly experienced declining response rates (CDC, 2021). According to Lindemann (2021), industry averages for response rates by for in-person, mail, email, online, and telephone surveys average 57%, 50%, 30%, 29%, and 18% respectively.

Table 6. Final Disposition Assignments

AAPOR Category	Final Disposition	AAPOR Code	Final Disposition Assignment
Interviewed	Complete	1.10	Assigned after completion of survey via phone
	Complete via Web	1.10	Assigned after completion of survey online
	Partial Complete	1.20	Assigned after partial completion of survey via phone and maximum call attempts
	Partial Complete via Web	1.20	Assigned after partial completion of survey online and maximum call attempts
Eligible, Not Interviewed	Refusal	2.11	Assigned after two refusals with interviewers trained in refusal conversion
	Not Complete	2.21	Assigned after confirming eligibility and maximum call attempts
Unknown Eligibility	Household Status Unknown	3.10	Assigned after maximum call attempts
	Non -Contact	3.12	Assigned after confirming household status and maximum call attempts
	Screener Incomplete	3.21	Assigned after speaking to a person who does not confirm or deny eligibility and maximum call attempts
Not Eligible	Non -Eligible	4.10	Assigned upon learning that the intended participant is under 18, not living in Pennsylvania, a non-English speaker, or physically or mentally unable to participate
	Non -Working	4.30	Assigned after three attempts dispositioned as non-working
	Non -Residential	4.50	Assigned upon learning the number is assigned to a business, used only for business purposes, or is a fax line

Table 7. Frequency of Summary Dispositions and Response Rates

Final Disposition	Landline	Cell Phone	Combined
Complete	232	983	1,215
Complete via Web	3	195	198
Partial Complete	24	135	159
Partial Complete via Web	0	18	18
Refusal	154	798	952
Not Complete	69	856	925
Household Status Unknown	1,108	15,250	16,358
Non-Contact	2,025	3,309	5,334
Screener Incomplete	1,743	16,203	17,946
Non-Eligible	44	1,675	1,719
Non-Working	5,775	8,696	14,471
Non-Residential	792	424	1,216
AAPOR Contact Rate 2	50.8%	20.2%	25.3%
AAPOR Cooperation Rate 2	62.7%	62.5%	62.5%
AAPOR Refusal Rate 2	18.9%	7.6%	9.5%
AAPOR Response Rate 3	28.9%	11.2%	14.2%

Survey Length and Completions

For our first experiment, we wanted to determine whether including a full assessment of problem gambling, versus a shorter problem screen that has been used in the first three years of the assessment, would decrease the number of participants to complete the survey. Overall, comparing the number of completed surveys to partially completed surveys, it appears that if participants begin the survey, they are likely to finish the survey. In fact, out of a total of 1,590 surveys started (1,375 via phone and 215 via web), approximately 89% ($n = 1,413$) were finished. Looking to partial completes, there were 159 partially completed surveys via phone and 18 partially completed surveys via web. Out of the 159 participants who partially completed the survey on the phone, 47 participants answered some of the introductory demographic items, but never responded to any items about their gambling behaviors, and as such never had the opportunity to be sorted into the either the full assessment or problem screen condition.

Continuing to drill down, out of the 159 partially completed surveys via phone, 56 participants reported at least one type of gambling and were asked to respond to items about their gambling behaviors (e.g., spending, hours, motivations, gambling context, etc.). Eighteen were eligible and sorted into the PPGM condition (i.e., gambled at least once per month on some format and randomly assigned to the PPGM condition). Out of this group of 18 eligible participants, 8 completed the full PPGM. Comparatively, out of the 56 participants that reported at least one type of gambling, 7 participants were eligible for and sorted into the BPGS condition (i.e., gambled at least once per month on some format and randomly assigned to the BPGS condition). Of this group, 4 individuals

completed the entire BPGS. While more than half assigned to the PPGM group did terminate during the measure, compared to less than half of the BPGS group, there is no statistically significant difference between those assigned to the PPGM group (mean progress of 69.9%) and those assigned to BPGS group (mean progress of 73.7%); however this finding should be interpreted with caution due to the surveys being of different lengths. In conclusion, these results suggest inclusion of the full assessment of problem gambling did not have any effect on participants' likelihood of completing the survey.

Contact Procedure Experiments

This year's survey utilized two experimental procedures related to contact procedures to determine the impacts on response rates: language used in invitations to complete the survey and the use of incentives.

With our scripting experiment, we randomly assigned numbers to be in either the "online gambling" or "recreation and leisure" groups. For the online gambling group, when individuals were invited to participate in the survey (either via the phone or through mail invitations), they were informed that they were invited to participate in a study about online gambling in Pennsylvania. For our recreation and leisure group, instead the script invited participants to participate in a survey about recreation and leisure activities in Pennsylvania. This experiment was based on prior research by Williams and Volberg (2010) that described their survey as a "gambling survey" to half their sample and "health and recreation" to the other half of their sample. In their study, they found that the prevalence rates of problem gambling were found to be 1.5 to 2.2 times higher in "gambling" versus "health and recreation" surveys, as it was proposed that a gambling survey was likely to be intrinsically more interesting to gamblers and problem gamblers, resulting in them participating at significantly higher rates.

Within our survey results, first we found that while participants in the recreation and leisure group were not more likely to complete the survey, they were more likely to agree to take the survey and less likely to refuse the survey compared to those in the online gambling group (Table 8). However, we were less likely to get in contact with participants in the recreation and leisure group. This slight decrease in contact with participants may be due to individuals in the online gambling condition being more likely to refuse the survey.

Examining responses from the surveys, we first wanted to determine whether the script impacted our recruitment of individuals who gamble and also specifically those who gamble online. There were slightly fewer gamblers in the recreation and leisure group (65.3%) compared to the online gambling group (66.4%); however, this difference was not statistically significant (Table 9). Similarly, in the recreation and leisure group, there were slightly fewer online gamblers (19.2%) compared to the online gambling group (20.6%), but this difference was also not statistically significant.

Expanding analyses to frequency of gambling engagement, while the recreation and leisure group had slightly fewer individuals that engaged in gambling monthly or more (33.0% versus 35.9%), using a Kruskal-Wallis test to account for non-normality, there was again no significant difference between the conditions (Table 10).

Table 8. Response, Cooperation, Contact, and Refusal Rates Comparison

	Recreation and Leisure (<i>n</i> = 32,657)	Online Gambling (<i>n</i> = 27,854)	<i>p</i>
Response Rate 3	14.1	14.0	.803
Cooperation Rate 2	64.6	60.15	< .001
Refusal Rate 2	8.8	10.3	< .001
Contact Rate 2	24.9	25.8	.009

Note. All rates were calculated in accordance with AAPOR Response Rate Calculator 5.1 (2024).

Table 9. Proportion of individuals that gamble and online gamble in both scripting groups and chi-square tests.

	Recreation and Leisure (<i>n</i> = 887)	Online Gambling (<i>n</i> = 661)	Chi-Square	<i>p</i>
Gamble in past 12 months?			.195	.659
Yes	65.3%	66.4%		
No	34.7%	33.6%		
Gamble online past 12 months?			.404	.525
Yes	19.2%	20.6%		
No	80.8%	79.4%		

There were also no statistically significant differences in problem gambling or gambling problems between the online gambling and recreation and leisure groups. We had a total of 232 individuals complete the BPGS, with 131 in the recreation and leisure condition and 101 in the online gambling condition. Comparing the responses of these two conditions, 25.5% of those to in recreation and leisure group scored 1 or higher (indicating problem gambling) compared to 26.0% in the online gambling group; this difference was not significant ($\chi^2(1, 231) = .004, p = .951$). We had 237 individuals complete the PPGM, with 126 in the recreation and leisure group and 111 in the online gambling group. Based on the PPGM, 7.6% of individuals who completed the PPGM in the recreation and leisure group were problem or pathological gamblers compared to 8.1% in the online gambling group; here too there was no significant difference in the distribution based on group according to a Kruskal-Wallis test (Table 11).

These analyses provide evidence to support using only the recreation and leisure language in future iterations of the project, due to the increase in cooperation, decrease in refusals, and no difference in gambling behaviors or gambling problems.

With our second experiment we wanted to explore the impacts of incentive on response rates. Here we divided participants into four groups: control, pre-notification of the survey, pre-incentive, and promised incentive. In the control group, these individuals had addresses that were appended to the sample via the sampling company, but instead of receiving mail or any incentive were called as usual to conduct the survey. In the pre-notification group, individuals received a letter notifying them they were selected to participate in the survey (again half had the survey described as recreation and leisure and the other half online gambling), including a QR code for them to complete the survey online if they so choose, but also notifying them that they would be receiving calls from the Survey Research Center. With the pre-incentive group, along with the letter inviting them to participate, individuals

received \$2 in cash. Finally, with the promised incentive participants were notified in the letter that upon completion they would receive \$5 in the form of an Amazon e-gift card.

The pre-incentive appears to have worked the best, with the highest response, cooperation, and contact rates as well as the lowest refusal rates (Table 12). In addition, it does appear that the control group differs from the remainder of the sample, which also did not get anything in the mail. This is likely due to the fact that the control group had an available address that we could have mailed to, yet we did not. Thus, potential participants for whom an address is available to be appended appear to be different than those in the remainder of the sample in some systematic way.

Table 10. Distribution of maximum frequency of engagement in gambling based on scripting condition and Kruskal-Wallis analysis.

	Recreation and Leisure	Online Gambling	Chi-Square	<i>p</i>
Maximum gambling frequency in the past 12 months			1.489	.222
Not at all	34.7%	33.6%		
Less than once per month	32.4%	30.6%		
Once per month	10.1%	8.8%		
2-3 times a month	7.0%	8.6%		
Once a week	5.6%	7.8%		
2-3 times a week	5.8%	7.6%		
4 or more times a week	4.5%	3.1%		

Table 11. Distribution of PPGM classifications among those who completed the PPGM based on scripting condition and Kruskal Wallis analysis.

	Recreation and Leisure	Online Gambling	Chi-Square	<i>p</i>
PPGM Classification			.038	.846
Recreational Gambler	77.4%	76.7%		
At-Risk Gambler	15.0%	15.1%		
Problem Gambler	0.6%	4.9%		
Pathological Gambler	7.0%	3.2%		

*only given to monthly or greater

Table 12. Response, Cooperation, Contact, and Refusal Rates, and Price per Complete Comparison.

	Control (<i>n</i> = 998)	Pre- Notification (<i>n</i> = 998)	Pre- Incentive (<i>n</i> = 998)	Promised Incentive (<i>n</i> = 999)	Remainder of the Sample (<i>n</i> = 56,518)
Response Rate 3	7.3	12.0	15.5	10.9	13.9
Cooperation Rate 2	73.5	64.8	84.5	65.8	61.2
Refusal Rate 2	3.3	7.1	3.1	6.1	9.9
Contact Rate 2	12.4	20.2	20.1	17.7	25.6

Questionnaire

The questionnaire underwent several changes between the third and fourth years of the study. This year, the survey utilized the following measures:

Gambling Participation Instrument (GPI). The Gambling Participation Instrument (GPI; Williams et al., 2017) was designed to assess the frequency of gambling engagement, gambling spending, and the amount of time spent gambling across various formats. Frequency is assessed over the past 12 months, asking for each format (including instant lottery, lottery/raffle tickets, games of skill, electronic gambling including things like video poker and slot machines, table games, sports betting, fantasy sports, dog/horse racing, bingo, and other forms of gambling). Frequency options ranged from 0 (not at all), to 6 (4 or more times per week). For each format that individuals engaged in, they were asked which mode they had gambled on that format: online, offline, or via both modalities. For those that gambled online, they were asked which websites they had gambled on for each respective format. Individuals that gambled at all over the past 12 months were also asked to report how many hours they believed they spent gambling in a typical month and how much they believe they had spent (also considering whether they believed they were ahead) gambling in a typical month. For those who had gambled online, they were also asked which devices they had used to gamble online.

Gambling Motivation. Those who had gambled in the past 12 months were asked what their primary motivation for gambling was: to win money, for enjoyment/fun, to develop my skills, to compete or for the challenge, to socialize, to support worthy causes, to escape/relax/relieve stress, it makes them feel good about themselves, or other reasons.

Gambling Context. Individuals were asked whether they preferred to gamble alone or with friends/family, ranging from 1 (always alone) to 5 (always with friends/family).

Gambling Loyalty Program Membership. Individuals were asked if they were currently a member of any gambling rewards or loyalty programs, and specifically which programs they were enrolled in.

Importance of Gambling as a Leisure or Recreational Activity. Participants were asked how important gambling is as a leisure or recreational activity ranging from 1 (not at all) to 4 (very important).

Brief Problem Gambling Screen (BPGS). For half of those participants who had engaged in gambling at least once per month in the previous 12 months, we used the Brief Problem Gambling Screen (BPGS; Volberg & Williams, 2011) to assess gambling problems. The BPGS is a five-item measure that assesses preoccupation with gambling, needing to gamble with larger amounts of money to achieve same level of excitement, gambling longer/with more money than intended, borrowing and/or selling possessions to get money to gamble, and attempts to reduce or cease one's involvement in gambling. The measure has both high sensitivity and specificity, and a classification accuracy of 95.9%. The measure was modified to include a follow-up question (as is used in the PPGM; Williams and Volberg, 2010, 2014), to assess whether individuals were successful in their attempts to reduce their gambling or quit gambling.

Pathological and Problem Gambling Measure (PPGM). For the other half of those participants who had engaged in gambling at least once per month in the previous 12 months, we utilized the Pathological and Problem Gambling Measure (PPGM; Williams and Volberg, 2010, 2014) to assess problem gambling. The PPGM is a 17-item yes or no measure that uses a 12-month time frame and classifies people into recreational, at-risk, problem, and pathological gamblers. The measure is broken into three subscales assessing: problems, impaired control, and other issues. To be designated a problem gambler utilizing the PPGM, an individual must report evidence of impaired control of their gambling plus significant problems deriving from impaired control with their gambling (relationships, mental health, physical health, work/school, financial, or legal harms). The PPGM was designed to minimize false positives and false negatives and has demonstrated very good internal consistency, test–retest reliability, convergent validity, and discriminant validity as well as excellent classification accuracy for both treatment-seeking and non-treatment seeking problem gamblers (Back et al., 2015; Christensen et al., 2019; Williams and Volberg, 2014).

1-800-GAMBLER Contact. Individuals were asked whether they had ever called the 1-800-GAMBLER helpline themselves or for someone else. Follow up questions probed as to who they had called for (self or someone else) and whether any calls made were in the past 12 months.

Substance Use. Participants were asked to report how frequently they had consumed alcohol, products containing nicotine, and products containing cannabis in the past 12 months. In addition, we asked whether they had consumed any illegal drugs in the past 12 months and if they had, to identify what those substances were.

Mental Health. Participants were asked if in the past 12 months they had experienced any symptoms of a mental health disorder and the follow-up question asking them to indicate which disorder(s) this was.

Demographics. Participants were asked to indicate the following demographics: age, gender, race, ethnicity, county of residence, marital status, highest level of education, employment status, military service, sexual orientation, and personal income.

Data Weighting

The final weighted sample is representative of adults ages 18 and older living in Pennsylvania. Data raking procedures were conducted, and weights were calculated using the following factors: age, race, ethnicity, gender, and county of residence. Weights (spread = 0.22-7.04) were calculated in 100 iterations with 73.75% efficiency. Individuals with data missing on any of the selected variables had their weight replaced with the series mean (1.00). Tables 13-17 demonstrate the weighting schema achieved targets based on Pennsylvania populations estimates from the 2022 American Community Survey (U.S. Census Bureau, 2023a, 2023b).

Table 13. Actual, Target, and Weighted Proportions for Gender Identity

Gender Identity	Unweighted Proportions	Target Proportions	Weighted Proportions
Man	48.50%	49.35%	49.50%
Woman	50.70%	50.65%	49.70%
Other gender identity	0.40%		0.40%
Prefer not to answer	0.40%		0.40%
Total	100%	100%	100%

Table 14. Actual, Target, and Weighted Proportions for Race.

Race	Unweighted Proportions	Target Proportions	Weighted Proportions
Race 2 or more	2.6%	7.20%	6.8%
White only	83.2%	74.40%	73.5%
Black or African American only	7.0%	10.50%	10.5%
Asian only	1.8%	3.80%	3.7%
American Indian or Native Alaskan only	0.3%	0.30%	0.2%
Native Hawaiian or Pacific Islander only	0.1%	0%	0.1%
Other only	3.4%	3.80%	3.8%
None provided	1.6%		1.6%
Total	100%	100%	100%

Table 15. Actual, Target, and Weighted Proportions for Ethnicity

Ethnicity	Unweighted Proportions	Target Proportions	Weighted Proportions
Not of Hispanic, Latino, or Spanish origin	94.3%	91.40%	91.0%
Hispanic, Latino, or Spanish origin	5.1%	8.60%	8.4%
Prefer not to answer	0.7%		0.7%
Total	100%	100%	100%

Table 16. Actual, Target, and Weighted Proportions for Age

Age Group	Unweighted Proportions	Target Proportions	Weighted Proportions
18 to 19 years	2.0%	3.57%	3.4%
20 to 24 years	5.3%	8.02%	7.7%
25 to 29 years	4.2%	8.10%	7.8%
30 to 34 years	5.3%	8.34%	7.8%
35 to 39 years	5.7%	7.86%	7.4%
40 to 44 years	6.1%	7.38%	7.1%
45 to 49 years	6.5%	7.42%	7.2%
50 to 54 years	6.7%	8.15%	8.0%
55 to 59 years	9.8%	8.71%	8.3%
60 to 64 years	9.0%	8.87%	8.5%
65 to 69 years	11.5%	7.61%	7.3%
70 to 74 years	10.3%	6.00%	6.0%
75 to 79 years	6.1%	4.10%	4.2%
80 to 84 years	4.2%	2.72%	2.7%
85 years and over	4.0%	3.15%	3.3%
Prefer not to answer	3.3%		3.3%
Total	100%	100%	100%

Table 17. Actual, Target, and Weighted Proportions for County of Residence

County of Residence	Unweighted Proportions	Target Proportions	Weighted Proportions
Adams County	0.7%	0.80%	0.8%
Allegheny County	10.7%	9.50%	9.7%
Armstrong County	0.8%	0.51%	0.5%
Beaver County	1.6%	1.28%	1.4%
Bedford County	0.7%	0.37%	0.4%
Berks County	3.4%	3.29%	3.2%
Blair County	1.4%	0.95%	1.0%
Bradford County	0.4%	0.47%	0.4%
Bucks County	4.7%	4.91%	5.0%
Butler County	1.4%	1.47%	1.4%
Cambria County	0.9%	1.02%	1.1%
Cameron County	0.1%	0.03%	0%
Carbon County	0.4%	0.50%	0.5%
Centre County	1.8%	1.27%	1.3%
Chester County	3.5%	4.10%	4.2%
Clarion County	0.4%	0.30%	0.3%
Clearfield County	1.0%	0.62%	0.6%
Clinton County	0.7%	0.30%	0.3%
Columbia County	0.9%	0.51%	0.5%
Crawford County	0.7%	0.66%	0.6%
Cumberland County	2.4%	1.98%	2.0%
Dauphin County	3.4%	2.1%	2.3%
Delaware County	3.9%	4.43%	4.3%
Elk County	0.4%	0.23%	0.2%
Erie County	3.1%	2.11%	2.1%
Fayette County	1.0%	1.01%	1.1%
Forest County	0%	0.06%	0%
Franklin County	1.4%	1.21%	1.1%
Fulton County	0.2%	0.11%	0.1%
Greene County	0.4%	0.28%	0.3%
Huntingdon County	0.6%	0.35%	0.3%
Indiana County	0.7%	0.66%	0.7%
Jefferson County	0.3%	0.34%	0.3%
Juniata County	0.3%	0.19%	0.2%
Lackawanna County	1.3%	1.64%	1.5%
Lancaster County	3.7%	4.26%	4.1%
Lawrence County	0.7%	0.67%	0.6%
Lebanon County	1.0%	1.11%	1%
Lehigh County	2.1%	2.88%	2.9%
Luzerne County	2.7%	2.48%	2.6%
Lycoming County	1.0%	0.89%	0.8%
McKean County	0.5%	0.32%	0.3%
Mercer County	0.8%	0.85%	0.8%
Mifflin County	0.5%	0.36%	0.3%
Monroe County	0.9%	1.3%	1.3%
Montgomery County	5.7%	6.49%	6.6%
Montour County	0.4%	0.14%	0.1%
Northampton County	1.3%	2.38%	2.4%
Northumberland County	0.9%	0.71%	0.7%
Perry County	0.5%	0.36%	0.3%


Table 17. continued

County of Residence	Unweighted Proportions	Target Proportions	Weighted Proportions
Philadelphia County	7.3%	12.37%	12.2%
Pike County	0.3%	0.44%	0.4%
Potter County	0.1%	0.13%	0.1%
Schuylkill County	1.1%	1.10%	1.1%
Snyder County	0%	0.32%	0%
Somerset County	0.7%	0.57%	0.5%
Sullivan County	0.1%	0.05%	0%
Susquehanna County	0.2%	0.32%	0.3%
Tioga County	0.5%	0.32%	0.3%
Union County	0.7%	0.35%	0.3%
Venango County	0.8%	0.40%	0.4%
Warren County	0.3%	0.31%	0.3%
Washington County	2.1%	1.62%	1.7%
Wayne County	0.1%	0.40%	0.4%
Westmoreland County	3.0%	2.73%	2.6%
Wyoming County	0.1%	0.21%	0.2%
York County	3.3%	3.51%	3.4%
Prefer not to answer	1.0%		1.0%
Total	100%	100%	100%

Data Coding

In order to conduct analyses, several variables required researcher coding in order to be used. With gambling frequency, participants were asked to indicate how frequently they engaged in each specific format. Here we collapsed responses across categories to generate the maximum gambling frequency that each individual indicated. For gambling spending, for individuals that indicated they were ahead and had not spent any money on gambling, these responses were re-coded into a new variable indicating the amount they were ahead, and spending was recoded to \$0; true missing values for spending were imputed with the series mean. For gambling modality, individuals were assigned their designation based on responses to all gambling formats: individuals classified as EOFGs were those who had only participated in gambling offline for every format they had engaged in, EONGs were those who had only participated in gambling online for every format they had engaged in, and MMGs were those who had participated in at least one form of gambling online and one format offline (or alternatively the same format both online and offline).

Open-ended responses to websites that individuals indicated they had gambled on were categorized by a trained research assistant as either legally regulated online gambling or illegal/unregulated online gambling. Legally regulated online gambling included websites that are recognized and licensed by their respective authorities (i.e., PGCB, Pennsylvania Lottery, or Department of Agriculture). For responses in which we were uncertain, a conservative approach was used; that is, in instances where individuals left the response blank, could not remember where they had gambled, or were generic (i.e., “casino website” or “app”), these responses were coded as legally regulated online gambling. The exception to this was online gambling formats that are not currently legally available online in Pennsylvania such



as online bingo, where these responses were coded by default as illegal/unregulated online gambling. This category also included responses that indicated use of peer-to-peer transfers of funds for online gambling (such as the use of Venmo for fantasy football leagues that utilize free platforms such as ESPN to run fantasy leagues), use of social gambling websites, and use of cryptocurrency or real money to gamble through these social casinos.

Mental health was assigned into categories by a trained research assistant: ADHD, autism, depression, mood disorders (e.g., bipolar disorder), personality disorders, anxiety disorders, substance use disorders/addiction, obsessive-compulsive disorder, dementia, schizophrenia, or other disorders.

APPENDIX B: DETAILED ANALYSES

This section includes a detailed breakdown of the results of analyses conducted throughout the report.

Gambling Prevalence

Expanding on the previous findings comparing participation in formats, regardless of modality, there was a significant difference in participation based on modality for all formats (Table 18). Post-hoc tests found that: a significantly higher proportion of MMGs than both EOFGs ($p < .01$) and EONGs ($p < .001$), as well more EOFGs than EONGs ($p < .001$) engaged in instant lottery; significantly more MMGs and EOFGs engaged in lottery and raffles than EONGs ($p < .001$); significantly more MMGs engaged in games of skill than EOFGs ($p < .001$; Note: games of skill are not online, only offline, so only compared between EOFGs and MMGs); significantly more MMGs than EOFGs ($p < .001$) and EONGs ($p < .01$) engaged in EGM play; MMGs were significantly more likely than both EOFGs and EONGs to gamble on table games ($p < .001$); a significantly higher proportion of MMGs bet on sports than EOFGs and EONGs ($p < .001$); significantly more MMGs than EOFGs ($p < .001$) and EONGs ($p < .01$) bet on fantasy sports; significantly more MMGs and EOFGs had bet on bingo than EONGs ($p < .01$); significantly more MMGs had bet on racing than EOFGs; and, significantly more EONGs and MMGs had bet on other forms of gambling than EOFGs ($p < .001$).

Table 18. Participation in gambling formats based on gambling modality and Chi-Square analyses.

Format	Gambling Modality			Chi-square	df	p
	EOFGs	EONGs	MMGs			
Instant Lottery	66.0%	26.4%	77.9%	44.668	2	< .001
Lottery/Raffles	79.1%	18.4%	77.2%	79.851	2	< .001
Games of Skill ^a	11.9%	N/A	29.7%	43.273	1	< .001
EGMs	17.0%	13.4%	45.0%	85.687	2	< .001
Table Games	11.6%	8.8%	47.8%	161.126	2	< .001
Sports	8.0%	16.6%	50.2%	229.140	2	< .001
Fantasy Sports	2.7%	3.5%	23.9%	120.086	2	< .001
Bingo	19.3%	3.0%	19.8%	7.312	2	.026
Racing	3.5%	0%	11.8%	28.275	2	< .001
Other Gambling	4.5%	41.6%	25.2%	118.825	2	< .001

^aGames of skill as defined are not available online.

Expanding on the number of formats individuals gamble on, there was significant difference in the average number of formats an individual engaged in based on their modality, ($\chi^2 (2, 1058) = 393.460, p < .001$). EOFGs gambled on average on 2.23 ($SD = 1.22$) formats, EONGs gambled on 1.32 ($SD = 0.77$) formats, while MMGs gambled on 5.02 ($SD = 2.39$) formats on average. Post-hoc Dunn-

Bonferroni comparisons determined that MMGs gambled on significantly more formats than both EONGs ($p < .001$) and EOFGs ($p < .001$), and EOFGs gambled on significantly more formats than EONGs ($p < .001$).

Comparing how frequently these individuals gambled, there was a significant difference in the frequency that individuals engaged in gambling ($\chi^2 (2, 1058) = 104.913, p < .001$) with EOFGs reporting the least frequent gambling, on average participating once per month ($M = 2.03; SD = 1.42$). EONGs engaged slightly more frequently, at almost 2 to 3 times per month ($M = 2.75; SD = 1.93$). Finally, the most frequent gambling was found among MMGs, with these individuals gambling almost once per week ($M = 3.22; SD = 1.83$). Post-hoc Dunn-Bonferroni comparisons determined that MMGs ($p < .001$) and EONGs ($p < .01$) gambled significantly more frequently than EOFGs.

There was significant variation in the average number of hours spent gambling in a typical month following the same pattern ($\chi^2 (2, 1058) = 146.684, p < .001$). EOFGs spent the fewest hours on average gambling per month at an average of 2.41 hours ($SD = 10.97$), EONGs spent 5.10 hours gambling on average ($SD = 9.01$), and MMGs indicated the highest number of hours spent gambling per month on average at 10.26 hours ($SD = 29.68$). Post-hoc Dunn-Bonferroni comparisons determined that MMGs spent significantly more hours gambling than EOFGs ($p < .001$) and EONGs spent significantly more hours gambling than EOFGs ($p < .001$).

There was significant variation in the average monthly spending on gambling reported based on gambling modality ($\chi^2 (2, 1058) = 72.329, p < .001$). EOFGs had the lowest median spending at \$10, followed by EONGs with a median spending of \$20 per month, and MMGs reported the highest median monthly spending of \$50. Post-hoc Dunn-Bonferroni comparisons determined that MMGs spent significantly more on gambling in an average month than both EONGs ($p < .01$) and EOFGs ($p < .001$).

Demographics

First, there was a significant difference in the age of those who engaged in each mode of gambling, $\chi^2 (2, 1024) = 154.422, p < .001$. Post-hoc Dunn-Bonferroni comparisons found that EOFGs were significantly older than both EONGs and MMGs ($p < .001$). Second, there was a significant gender difference based on modality, $\chi^2 (2, 1005) = 24.453, p < .001$. Follow-up tests using Bonferroni corrected p-values found that for both EONGs ($p < .01$) and MMGs ($p < .001$) there was a significantly higher proportion of men represented in these modalities than for EOFGs. Third, there was a significant difference in the race of individuals based on their chosen modality, $\chi^2 (4, 1012) = 34.87, p < .001$. Follow-up tests using a Bonferroni corrected p-value found that there was a significantly higher proportion of EOFGs that identified as white only than EONGs ($p < .05$) and MMGs ($p < .001$), there was also significantly more MMGs that identified as Black/African American only than EOFGs ($p < .001$). Relatedly, fourth, there was a significant difference in the ethnicity of individuals based on modality, $\chi^2 (2, 1005) = 15.551, p < .001$. Follow-up tests using a Bonferroni corrected p-value found a significantly higher proportion of MMGs and EONGs identifying as being of Hispanic, Latino/a, or Spanish origin than EOFGs ($p < .01$). Due to large portions of the sample, particularly EONGs missing data for income, employment, education, marital status, sexuality, and military status we did not conduct analyses comparing these demographics based on gambling modality.

Gambling Context

Looking to the gambling context, there was a significant difference in whether individuals gambled alone or with others based on modality; $\chi^2(2, 914) = 17.144, p < .001$. Post-hoc Dunn-Bonferroni comparisons found that EONGs tended to gamble less socially than both EOFGs ($p < .001$) and MMGs ($p < .01$), and MMGs tended to gamble slightly less socially than EOFGs ($p < .01$). Second, there was a significant difference in the proportion of individuals that belonged to a gambling loyalty or rewards program based on modality, $\chi^2(2, 950) = 71.158, p < .001$. Follow-up tests using Bonferroni corrected p-values found that for MMGs were significantly more likely than EOFGs ($p < .001$) and EONGs ($p < .05$). Finally, looking to the importance of gambling as a recreation or leisure activity, there was also a significant difference, $\chi^2(2, 993) = 43.827, p < .001$. Post-hoc Dunn-Bonferroni comparisons found that MMGs tended to rate gambling as more important than both EONGs ($p < .01$) and EOFGs ($p < .001$).

Substance Use and Mental Health

Expanding on the previous findings comparing substance use and mental health based on gambling modality, there were several significant differences in terms of substance use. With alcohol consumption, whether individuals had consumed alcohol in the past year there was a significant difference based on gambling modality, $\chi^2(2, 922) = 10.048, p < .01$. Follow-up tests using Bonferroni corrected p-values found that MMGs were more likely to consume alcohol in the past year than EOFGs ($p < .01$). Consumption of products containing tobacco or nicotine also varied significantly based on gambling mode, $\chi^2(2, 923) = 67.780, p < .001$. Follow-up tests using Bonferroni corrected p-values found that MMGs were more likely than EOFGs to have consumed these products in the past year ($p < .001$). Finally with cannabis products, there was a significant difference based on gambling modality, $\chi^2(2, 923) = 67.780, p < .001$. Follow-up tests using Bonferroni corrected p-values found that MMGs were more likely to consume cannabis products in the past year than EOFGs ($p < .001$). With mental health, all gamblers of all modality types were equally as likely to have expressed experiencing symptoms of a mental health disorder over the previous year, $\chi^2(2, 919) = 0.255, p = .880$.

Gambling Problems and Problem Gambling


Within our BPGS condition, the proportion of individuals that scored one or higher on the BPGS differed significantly based on modality, $\chi^2(2, 231) = 21.295, p < .001$. Follow-up tests using Bonferroni corrected p-values found that MMGs were more likely to score one or higher on the BPGS than EOFGs ($p < .001$).

With the PPGM due to the application to only half the sample and the small number of EONGs results should be interpreted with caution, in particular the proportion of EONGs identified as pathological gamblers. These distributions differed significantly based on modality, $\chi^2(2, 246) = 30.281, p < .001$. Follow-up tests using Bonferroni corrected p-values found MMGs ($p < .001$) and EONGs ($p < .05$) were more likely to be classified at problem or pathological gamblers than EOFGs.

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