Gambling and Problem Gambling in Massachusetts: Results of a Follow-up Population Survey

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SEIGMA

SOCIAL AND ECONOMIC IMPACTS OF GAMBLING IN MASSACHUSETTS

UNIVERSITY OF MASSACHUSETTS SCHOOL OF PUBLIC HEALTH AND HEALTH SCIENCES

Authorship and Acknowledgements

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Acronyms and Abbreviations

AAPOR	American Association of Public Opinion Research
ABS	Address Based Sampling
ADW	Advance Deposit Wagering
BGPS	Baseline General Population Survey
CATI	Computer Assisted Telephone Interview
CI	Confidence Interval
CPGI	Canadian Problem Gambling Index
DFS	Daily Fantasy Sports
DSM	Diagnostic and Statistical Manual of Mental Disorders
EBH	Encore Boston Harbor
EGM	Electronic Gambling Machine
FGPS	Follow-up General Population Survey
FOPS	Follow-up Online Panel Survey
IRB	Institutional Review Board
MGC	Massachusetts Gaming Commission
MGM	MGM Springfield
NSF	Not Sufficient Information (refers to cells in tables with estimates that are considered unreliable due to large relative standard errors)
OPGS	Office of Problem Gambling Services, Massachusetts Department of Public Health
OPS23	Online Panel Survey 2023
PASPA	Professional and Amateur Sports Protection Act of 1992
PPC	Plainridge Park Casino
PPGM	Problem and Pathological Gambling Measure
PUMS	Public Use Microdata Sample
RSE	Relative Standard Error
SAQ	Self Administered Questionnaire
SE	Standard Error
SEIGMA	Social and Economic Impacts of Gambling in Massachusetts
SFTP	Secure File Transfer Protocol
SOGS	South Oaks Gambling Screen
UMass	University of Massachusetts Amherst

Executive Summary

Background

In November, 2011, an Act Establishing Expanded Gaming in the Commonwealth was passed by the Legislature and signed by Governor Deval Patrick (Chapter 194 of the Acts of 2011). This legislation permitted casinos and slot parlors to be introduced in Massachusetts under the regulatory auspices of the Massachusetts Gaming Commission (MGC). Section 71 of the Expanded Gaming Act requires the MGC to establish an annual research agenda to understand the social and economic impacts of these new venues. In March 2013, the MGC selected a research team from the University of Massachusetts Amherst (UMass) School of Public Health and Health Sciences to carry out the Social and Economic Impacts of Gambling in Massachusetts (SEIGMA) study to monitor these impacts over time.

The main purpose of the present report is to determine whether and how gambling attitudes, gambling behavior, and problem gambling prevalence changed in Massachusetts following the introduction of casinos. Results from the Follow-up General Population Survey (FGPS) are directly comparable to survey data collected in Massachusetts in 2013 and 2014, before any of the casinos had opened. In addition to these overall assessments, the report addresses the question of whether the demographic and behavioral patterns of gambling and problem gambling prevalence changed in Massachusetts between 2013 and 2021.

The question of when to field the FGPS required balancing opposing considerations. These included concerns about the ability to attribute changes in attitudes and behaviors specifically to the introduction of casinos given the passage of time, the likely impact of COVID-19 on gambling behavior given casino closures and capacity restrictions in 2020 and 2021, and the pending legalization of sports betting in Massachusetts which made it desirable to carry out the survey sooner rather than later. The final decision on when to field the survey was made with input from the MGC and members of the MGC's Research Review Committee.

Methods

The SEIGMA team obtained a probability sample of all Massachusetts households and allowed survey respondents aged 18 and over to complete the survey online, on paper, or by telephone. The sample included targets for Asians, Hispanics, Blacks, and adults aged 18-29, groups that are less likely to participate in surveys than other groups in the population. The survey launched in September 2021 and concluded in April 2022, had a weighted response rate of 27.5% and achieved a final sample size of 6,293 respondents. This report presents a comprehensive compilation of descriptive results from the survey. Comparisons described as 'higher' or 'lower' are based on statistical tests of significance. This report does not include deeper explorations of the data; the SEIGMA research team will conduct in-depth analyses in the future and release findings as they become available.

Key Findings

Attitudes about Gambling in Massachusetts

There is a range of opinion among Massachusetts adults concerning the legalization, availability, and impact of gambling in the Commonwealth.

- The majority of Massachusetts adults (67.5%) believed that some forms of gambling should be legal and some should be illegal, with only a minority reporting that all forms should be legal (22.6%) or all forms should be illegal (9.9%).
- The majority of Massachusetts adults (67.5%) believed that the availability of gambling in Massachusetts was too high, with 20.6% reporting that it was not available enough, and 11.8% reporting that the current availability was fine. It is notable that this attitude prevailed prior to the legalization of sports betting in the Commonwealth.
- Massachusetts adults had mixed opinions about the impact of casinos in the state, with almost equal numbers of people believing the casinos had been harmful (25.1%) or beneficial (29.1%).
- The most positive impacts of casinos in Massachusetts were viewed as employment (36.7%) followed by retaining money that was leaving Massachusetts (17.3%) and increased government revenue (14.3%).
- The most negative impacts of casinos in Massachusetts were viewed as increased gambling addiction (45.1%) followed by increased traffic congestion (18.8%) and increased crime (10.7%).

Gambling in Massachusetts

We define gambling as betting money or material goods on an event with an uncertain outcome in the hopes of winning additional money or material goods. This includes things such as lottery games, bingo, betting against a friend on a game of skill or chance, and betting on sports or horse racing. Overall, 60.2% of Massachusetts adults reported participating in one or more of these gambling activities in the past year. This compares to 73.1% in 2013.

- A total of 39.8% of the population did not gamble in the past year, whereas 33.5% gambled 1-11 times in the past year, 14.6% gambled monthly, and 12.1% gambled weekly.
- Past-year gambling participation among Massachusetts adults was lower in 2021 compared to 2013 for all gambling activities except daily lottery games and online gambling. The steepest declines were for raffles, private wagering, and bingo. Our analyses suggest that part of this decline was due to the lingering effects of COVID-19 restrictions.
- One-sixth (15.7%) of Massachusetts adults reported visiting casinos to gamble in 2021. Of these, about one-third only gambled at Massachusetts casinos, about one-quarter only gambled at out-of-state casinos (mostly Connecticut and Rhode Island) and the remainder gambled at casinos both in Massachusetts and out-of-state.
- Although the survey was carried out before sports betting was legalized in Massachusetts, 9.9% of Massachusetts adults reported betting on sports in the past year. Sports bettors in Massachusetts were most likely to be male, aged 25-54, White, employed, and with annual household incomes of $150,000 or over.
- Past-year gamblers in Massachusetts were most likely to say that winning money was the main reason they gambled, followed by excitement and/or entertainment, to socialize with family or friends, and to support worthy causes.
- Self-reported gambling expenditures are an important measure of gambling participation although such reports tend to be unreliable when compared to known gambling revenues. Massachusetts adults in 2021 reported spending the largest proportion of self-reported expenditures on lottery games (42%) followed by casino gambling (21%) and sports betting (16%). The only form of sports betting that was legal in Massachusetts in 2021 was daily fantasy sports (DFS).

Problem Gambling in Massachusetts

Based on their answers to a standard set of questions, we classified people who gambled in the past year as recreational gamblers, at-risk gamblers, and problem gamblers. Recreational gamblers gamble because they enjoy these activities. At-risk gamblers engage in a range of behaviors that place them at greater risk of

experiencing a gambling problem, such as persistently betting more than planned, spending more time gambling than intended, chasing losses, and borrowing money to gamble. Problem gamblers are individuals who experience significant impaired control over their gambling and negative consequences as a result of their impaired control.

- The prevalence of problem gambling in Massachusetts in 2021 was 1.4% of the population aged 18 and over. An additional 8.5% of the population aged 18 and over were classified as at-risk gamblers. It should be noted that because gambling participation was suppressed to some extent in 2021 by COVID-19, it is reasonable to assume that problem gambling may also have been suppressed to some extent.
- Based on these percentages, we estimate that between 54,389 and 114,217 Massachusetts adults were problem gamblers in 2021. An additional 402,481 to 533,015 Massachusetts adults were at-risk gamblers.
- The prevalence of problem gambling in Massachusetts in 2021 was not significantly different from the prevalence rate of 2.0% identified in Massachusetts in 2013. The rate of at-risk gambling was also not significantly different from the rate of 8.4% identified in 2013.
- The prevalence of problem gambling in Massachusetts in 2021 was mid-range compared to prevalence rates identified in other U.S. states since 2015.
- Compared to recreational gamblers, problem gamblers in Massachusetts in 2021 were most likely to be:
    - Male
    - Non-White
    - Have a high school diploma or less
    - Have annual household income under $50,000
- Problem gamblers accounted for approximately 20% of total gambling expenditure in Massachusetts in 2021.

Comparing Recreational, At-Risk, and Problem Gamblers in Massachusetts

There were notable differences between recreational, at-risk, and problem gamblers in Massachusetts in 2021. At-risk and problem gamblers in Massachusetts were more likely than recreational gamblers to be:

- Male
- Non-White
- Have a high school diploma or less
- Unemployed

Results of the survey show that, compared to recreational gamblers, at-risk and problem gamblers were more likely to report:

- Most or all of their friends and family gambled regularly
- Poor or fair physical health as opposed to good or excellent health
- Using tobacco

Awareness of Problem Gambling Services in Massachusetts

Awareness of problem gambling prevention initiatives in Massachusetts was quite low in 2021. About two in 10 Massachusetts adults (20.9%) were aware of media campaigns to prevent problem gambling and 9.2% were aware of programs to prevent problem gambling offered in schools, workplaces, or in the community. By way of comparison, awareness of media campaigns to prevent problem gambling in 2013 was 41.0% and awareness of non-media prevention programs was 13.1%.

Changes Since 2013 and Future Directions

There have been changes in gambling attitudes and gambling behavior in Massachusetts since the baseline survey was carried out in 2013. More specifically:

- Significantly more people now believe that some types of gambling should be legal and some should be illegal (an increase from 55.2% to 67.5%), with corresponding decreases in the percentage of people who believe all types should be illegal or all types should be legal.
- Considerably more people now believe that gambling is too widely available (increase from 15.6% to 67.5%).
- Considerably more people now believe that the benefits of casinos are about equal to the harms (increase from 18.9% to 45.8%), with corresponding decreases in the percentage of people who believe that casinos are predominantly harmful or beneficial.
- There has been a significant decrease in past year participation in most types of gambling from 2013 to 2021, and an increase in the percentage of people who report not gambling at all (38.7% non-gamblers in 2021 compared to 26.6% in 2013). The exception to this pattern is that no significant declines were seen in daily lottery games, horse racing, and online gambling. The lingering effects of COVID-19 and the associated restrictions are likely partly responsible for these broad declines.
- Decreased past year gambling participation includes decreased casino participation, which declined from 21.5% to 15.7%, despite the introduction of three casinos in Massachusetts in 2015 (Plainridge Park Casino), 2018 (MGM Springfield), and 2019 (Encore Boston Harbor). However, one of the reasons for the introduction of casinos in Massachusetts was to recapture out-of-state expenditure, and there has been a significant decrease in out-of-state casino patronage from 21.5% in 2013 to 10.2% in 2021, with most of the reduction occurring in the patronage of Connecticut casinos.
- There has been no significant change in the rate of problem gambling from 2013 (2.0%) to 2021 (1.4%), which is again notable considering the introduction of three casinos.

In our comparison of recreational, at-risk, and problem gamblers in Massachusetts in 2021, we noted that at-risk and problem gamblers in 2021 were more likely to gamble for excitement or entertainment and less likely to gamble to win money compared to 2013. Other important changes from 2013 are that at-risk gamblers accounted for a much larger proportion of total gambling expenditures in 2021 and that there are no longer significant differences in rates of depression, anxiety and other mental health problems between recreational gamblers and at-risk and problem gamblers. We also noted changes between 2013 and 2021 in tobacco, alcohol, and drug use of different groups of gamblers with less tobacco use and alcohol bingeing but more drug use among recreational gamblers and less alcohol bingeing among problem gamblers. Finally, we identified a substantial reduction in awareness of problem gambling prevention media and non-media campaigns between 2013 and 2021.

The data presented in this report tell us a great deal about gambling attitudes, behavior, problems, and prevention awareness in Massachusetts in 2021. These data will continue to enrich our understanding of gambling and problem gambling in Massachusetts through additional analyses and research activities. Additionally, all of these data will be made public over time to enable other researchers and stakeholders to conduct their own analyses and add to the body of knowledge about gambling in Massachusetts.

Introduction

Background to the 2021 Follow-up General Population Survey

In November, 2011, an Act Establishing Expanded Gaming in the Commonwealth was passed by the Legislature and signed by Governor Deval Patrick (Chapter 194 of the Acts of 2011). This legislation permitted casinos and slot parlors to be introduced in Massachusetts under the regulatory auspices of the Massachusetts Gaming Commission (MGC). Three casino licenses were available, with one allocated for the Greater Boston area, one for Western Massachusetts, and one for Southeastern Massachusetts. A single license for a slot parlor was also available, with no geographic restriction as to its location.

Section 71 of the Expanded Gaming Act requires the MGC to establish an 'annual research agenda' and identifies three essential elements of this research agenda:

- A baseline study of problem gambling and the existing prevention and treatment programs that address its harmful consequences;
- Comprehensive studies of the social and economic impacts of gambling in the commonwealth; and
- Individual studies relative to the neuroscience, psychology, sociology, epidemiology, and etiology of gambling.

Section 71 required the MGC to conduct a baseline study of problem gambling prevalence and available treatment services before any of the new gaming facilities became operational. To this end, the MGC issued a Request for Response for Research in November, 2012. In March of 2013, the MGC selected a research team from the University of Massachusetts Amherst (UMass) School of Public Health and Health Sciences to carry out a comprehensive research agenda that included both the baseline study of problem gambling and a study of the social and economic impacts of casino gambling in Massachusetts. The study, titled the Social and Economic Impacts of Gambling in Massachusetts (SEIGMA), was originally envisioned as a before-after evaluation of the impacts of the introduction of casinos in Massachusetts. However, the gradual introduction of the casinos over an extended period between 2015 and 2019 led to the decision to produce periodic reports that comprehensively documented the known impacts *every two to three years,* with the first report occurring in 2018 (for more information, visit: www.umass.edu/seigma).

The question of when to field the Follow-up General Population Survey (FGPS) required balancing opposing considerations. First, the original research plan was a before-and-after study to measure attitudes and behaviors before the introduction of casinos and after their introduction with any changes attributed to the casinos. While the Baseline General Population Survey (BGPS) was fielded in 2013 and 2014, casino construction took far longer than anticipated and there was concern that further delays would weaken the ability to attribute changes to the introduction of casinos. Second, the largest casino in Massachusetts did not open until June 2019 which, according to the original research plan, would have meant fielding the follow-up survey in mid-2020; with COVID-19 lockdowns starting in March 2020 and continued capacity restrictions even after the casinos re-opened, it seemed advisable to wait until the worst of the pandemic was over before fielding the survey. Third, fielding a survey of the proposed size and scope requires lengthy preparation, which meant that the decision about when to field the survey needed to be made far in advance of going into the field. Finally, it was clear by early 2021 that the legalization of sports betting in Massachusetts would occur soon and it was deemed important to field the survey before legalization to establish the rate of sports betting participation before

legalization occurred. The final decision on fielding the survey was made with input from the MGC and members of the MGC's Research Review Committee.

Legal Forms of Gambling in Massachusetts

Legal gambling in Massachusetts includes a state lottery, charitable gambling, casino gambling, parimutuel wagering on horse and dog races, and most recently retail and online sports betting. Other types of gambling available to Massachusetts residents include casino gambling in Connecticut and other out-of-state locations, and remote gambling by telephone, on mobile devices, and online. In this section, we provide background on the legal forms of gambling in Massachusetts.

Horse and Dog Racing

Parimutuel wagering involves betting among a pool of players rather than betting against the house, as happens at a casino (Tidwell, Welte, Barnes, & Dayanim, 2015). Parimutuel wagering on horse and dog races was legalized in Massachusetts in 1934 and live racing was held at four racetracks as well as at agricultural fairs around the state until well into the present century. Wagering on horse and dog races declined steadily over the 20th century and many tracks have struggled to survive as purses, attendance, and the number of races have fallen and competition from other forms of gambling has grown (Tidwell et al., 2015). One innovation adopted in Massachusetts in 2009 is Advance Deposit Wagering (ADW) which allows bettors to deposit funds into an account and place bets on races taking place in other jurisdictions using a mobile device, with winnings deposited back into the account.

Live dog racing was banned in Massachusetts in 2009 and the state's two greyhound tracks closed at the end of that year (Moskowitz, 2009). Simulcast wagering on greyhound, harness, and thoroughbred racing, which involves satellite broadcasts of races from other tracks so that wagers from multiple tracks can be combined, is still offered at Raynham Greyhound Park, Suffolk Downs in East Boston, and Plainridge Racecourse. Harness racing, which began in Massachusetts in 1947, continues today at Plainridge Racecourse (Temple, 2010). In 2012, oversight of the horse racing industry was taken over by the newly established Massachusetts Gaming Commission.

In 2013, the handle (or total amount of money wagered) at Suffolk Downs, Plainridge Racecourse, and the two dog tracks where simulcast wagering was still offered totaled $277 million. In 2021, the handle at Suffolk Downs, Plainridge Racecourse, and the two dog tracks where simulcast wagering is still offered totaled $294 million (representing a 6.1% increase over approximately a decade) (Massachusetts Gaming Commission, 2014, 2021). The legal age to participate in parimutuel wagering on horse and dog races in Massachusetts is 18.

Massachusetts Lottery

The Massachusetts Lottery was created in 1971 to generate local aid for the 351 cities and towns in the Commonwealth. Using a formula established by the Legislature, the cities and towns of Massachusetts receive approximately 20% of total lottery sales on an annual basis. Because these funds are not earmarked for specific programs, cities and towns are able to decide how they wish to spend the funds.

Starting with a weekly draw game in 1972, the Lottery has added numerous other products to its mix including instant tickets in 1974 (the first state to do so), a daily numbers game in 1976, and a variety of traditional, large jackpot games in the 1980s and 1990s. In 1993, the Lottery introduced Keno, a casino-style game offered every few minutes on monitors in approximately 1,200 bars, restaurants, and similar establishments around the state. In 1996, the Lottery joined five other states to create an early multi-state lottery game that allowed for much larger maximum prizes. The Massachusetts Lottery is overseen by the Lottery Commission in the Office of the

State Treasurer and maintains a statewide network of over 8,000 retail sales agents, including chain stores, supermarkets, gas stations, convenience stores, and corner stores (Pugh, 2022). These retailers earn commissions on lottery sales and bonuses on prizes claimed. In FY2022, the average retailer earned nearly $42,000 from lottery products.

In FY2014, Massachusetts Lottery revenues totaled $4.9 billion with 70% of these revenues accounted for by instant games (Massachusetts Lottery Commission, 2014). In FY2022, Massachusetts Lottery revenues totaled $5.86 billion (representing a 19.6% increase over the decade) with 66% of these revenues accounted for by instant games. In the same fiscal year, the Lottery paid out a total of $4.3 billion in prizes; this 73.5% return to players is one of the highest in the country. Massachusetts residents also spend the most per capita on the lottery in the United States (i.e., $805.30 per capita in 2020 with New York next at $455.93) (LendingTree, 2022). Direct local aid generated by lottery sales in FY2022 was $1.193 billion. The legal age to purchase lottery products in Massachusetts is 18 (www.masslottery.com).

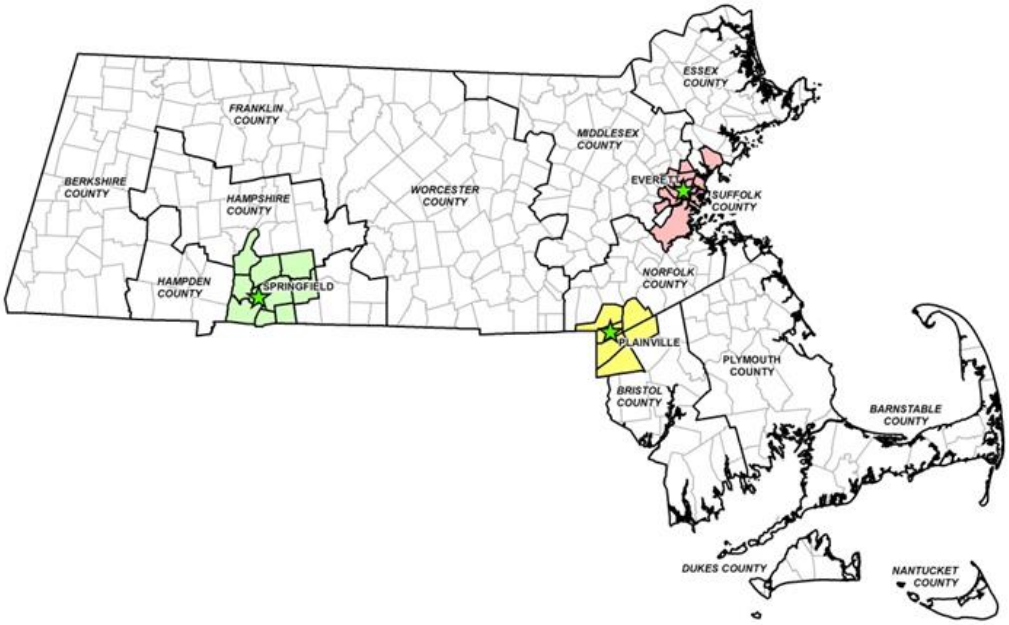
Charitable Gambling

Charitable gambling in Massachusetts in the form of bingo (sometimes called "Beano") was legalized in 1971 with oversight transferred in 1973 from the Department of Public Safety to the Massachusetts Lottery Commission. Other forms of charitable gambling, including raffles and 'casino nights' held as fundraisers by charitable organizations, churches, and schools, have been legal since 1969. The Massachusetts Lottery is responsible for collecting taxes on gross receipts from all bingo games, raffles, and casino nights. There are approximately 150 licensed charitable bingo operators in Massachusetts and several poker rooms operate under the casino night law with daily games benefiting a rotating set of charities. In 2013, gross revenues from charitable gambling included $33 million from bingo games and another $33 million from other charitable gambling activities (https://archives.lib.state.ma.us/handle/2452/208718). In 2022, gross revenues from charitable gambling included $12.7 million from bingo games and another $25.2 million from other charitable gambling activities (Massachusetts Lottery Commission, 2022). This represents a 42.6% decrease over the decade. The legal age to participate in charitable gambling in Massachusetts is 18.

Casino Gambling

Following passage of the Expanded Gaming Act, two casinos and one slot parlor were ultimately approved by the MGC. The slot parlor, Plainridge Park Casino (PPC), is located in the Town of Plainville and opened on June 24, 2015. The Western Massachusetts casino, MGM Springfield (MGM), is located in the City of Springfield and opened on August 24, 2018. The Greater Boston casino, Encore Boston Harbor (EBH), is located in the City of Everett and opened on June 23, 2019. To date, no casino application has been approved for Southeastern Massachusetts. The locations of the three Massachusetts casinos and their associated surrounding communities are shown below in Figure 1.

Figure 1. Location of the Massachusetts casinos



PPC is the only slot parlor in Massachusetts and is located in the southeastern portion of the state close to Providence, Rhode Island. PPC features just under 44,000 square feet of gambling space with 904 slot machines as well as video poker, video blackjack, and other electronic table games. Amenities include six food and beverage outlets and a lounge hosting live entertainment. PPC is the only location in Massachusetts with live racing of any kind. Live harness races occur between April and November each year, and the venue hosts parimutuel wagering on horse and dog races outside of Massachusetts throughout the year. In February 2023, PPC opened a sportsbook operated by Barstool.

MGM was the first casino resort to open its doors in Massachusetts. It is located in downtown Springfield on approximately 14 acres on the north side of Interstate 91. The property features 126,000 square feet of gambling space with 1,527 slots, 62 table games including 14 poker tables and, since February 2023, a sportsbook operated by BetMGM. Amenities include a 241-room hotel, eight food and beverage outlets, 26,000 square feet of retail space, a bowling alley, and a cinema.

EBH is the newer of the two casino resort locations in Massachusetts. It is located on a 33-acre parcel on the banks of the Mystic River in Everett on the site of the former Monsanto plant. EBH features 190,000 square feet of gambling space, with 2,728 slot machines, 199 table games including 12 poker tables and, since February 2023, a sportsbook operated by WynnBET. Amenities include a full-service hotel, over 7,000 square feet of retail space, 13 food and beverage outlets as well as four bars and lounges, a spa, and convention space. The property includes extensive outdoor and waterfront space, known as the Harborwalk, which features walking paths along the river and an indoor garden.

Tax assessments on gross gaming revenue differ between the casino resorts and the slot parlor. The tax rate at the slot parlor is 49% of gross gaming revenues but the tax rate at the resort casinos is 25% of gross gaming revenues. In FY2022, the three properties generated $1.1 billion in gross gaming revenue with $311.5 million collected by the Commonwealth in tax revenues (Massachusetts Gaming Commission, 2022). The legal age to gamble at a casino in Massachusetts is 21.

Sports Betting

Fantasy sports betting, where bettors assemble virtual teams that accumulate points based on players' performances, is widely considered a game of skill rather than a form of gambling and has been popular in the U.S. since the early 2000s. In 2016, Massachusetts became the one of the first states to regulate daily fantasy sports betting (DFS) in the wake of highly visible efforts by DraftKings and FanDuel to recruit customers during the first weeks of the NFL season as well as a potential insider trading scandal. At that time, DraftKings (founded in 2011) and FanDuel (founded in 2009) controlled approximately 95% of the North American DFS market which was valued at $2.5 billion (O'Keeffe, 2015; Redford, 2015). The statute that governs DFS betting in Massachusetts is primarily focused on consumer protection and oversight is the responsibility of the Office of the Attorney General. The DFS betting statute bans any contests based on college or amateur sports events, limits participant deposits to $1,000 per month, and restricts employees of DFS operators from participating in DFS contests. The legal age to participate in DFS betting in Massachusetts is 21.

Following the Supreme Court decision in May 2018 striking down the 1992 Professional and Amateur Sports Protection Act (PASPA), states moved quickly to legalize sports betting around the country. By 2022, sports betting was legal in 35 states and the District of Columbia and was under active consideration in an additional four states, including Massachusetts. In August, 2022, an Act to Regulate Sports Wagering was passed by the Legislature and signed into law by Governor Charlie Baker. This legislation allows for up to 15 sports betting licenses in the Commonwealth with eight of the licenses tied to a land-based partner (licensed casinos and racetracks) and the other seven online licenses open to competitive bidding. The tax rate for retail sports betting is 15% but the tax rate for online sports betting is 20%. Individuals physically located in Massachusetts can wager on most professional sports leagues but cannot bet on in-state college teams unless the teams are playing in a tournament with four or more teams. The MGC is responsible for overseeing the establishment and regulation of the Massachusetts sports betting industry.

Retail sports betting at the state's three casinos launched at the end of January 2023, followed by the launch of online sports betting in March 2023. As of this writing, each of the three casinos in Massachusetts has been granted a Category 1 license to offer retail sports betting and there are five 'tethered' Category 3 licenses associated with these operators (BetMGM with MGM, Caesars Sportsbook and WynnBet with EBH, Fanatics Betting and Gaming and Penn Sports Interactive with PPC). An additional five 'untethered' licenses for online sports betting have been issued to Bally Bet, Betway, Betr, DraftKings and FanDuel but only three (Betr, DraftKings and FanDuel) are in operation.

Principal Study Questions

The main purpose of the Follow-up General Population Survey (FGPS) was to determine whether and how gambling attitudes, gambling behavior, and problem gambling prevalence changed in Massachusetts following the introduction of casinos. Results from the survey are directly comparable to survey data collected in Massachusetts in 2013 and 2014, before any of the casinos had opened (Volberg et al., 2017). In addition to these overall assessments, the report addresses the question of whether the demographic and behavioral patterns of gambling and problem gambling prevalence changed in Massachusetts between 2013 and 2021.

Theories and key findings of previous studies informed the development of research questions for the Follow-up General Population Survey (FGPS). Throughout the remainder of this report, we intend to test the following specific hypotheses:

H1. Attitudes towards gambling will be **less negative** in the follow-up survey (FGPS) than in the baseline survey (BGPS), reflecting Massachusetts adults' experience with casino gambling in the Commonwealth (Delfabbro & King, 2020).
H2. Participation in casino gambling will be **higher** in the follow-up survey than in the baseline survey, reflecting the impact of the introduction of casinos in Massachusetts (Jacques, Ladouceur, & Ferland, 2000; Zoglauer, Czernecka, Bühringer, Kotter, & Kräplin, 2021).
H3. Participation in lottery games will be **lower** in the follow-up survey than in the baseline survey, reflecting shifts in gambling participation and expenditures following the introduction of casinos in Massachusetts (Flessig, 2020; Humphreys, 2021).
H4. The prevalence of problem gambling will be **higher** in the follow-up survey than in the baseline survey, reflecting the increase in gambling availability in Massachusetts (Abbott, 2020).

In response to research requirements in the Sports Wagering Act of 2022, we intend to test one additional hypothesis related to the expansion of sports betting in the United States since 2018:

H5. Individuals participating in sports betting in Massachusetts will **differ** from individuals participating in other types of gambling.

Two additional research topics are specified in the Sports Wagering Act including (a) whether individuals experiencing problems with sports betting in Massachusetts **differ** from individuals experiencing problems with other types of gambling and (b) whether the impacts of sports betting are **higher** among Massachusetts adults aged 18 to 24 compared to those aged 25 and over. The challenge with each of these topics is that the number of individuals in the groups of interest in the FGPS is too small to support such analyses.[1] However, we anticipate that results from the Follow-up Online Panel Survey (FOPS) carried out in 2022 and the Online Panel Survey 2023 (OPS23) will support these analyses and yield useful information in the future.

This report presents a comprehensive compilation of descriptive results from the FGPS. The report is organized into several sections for clarity of presentation. Following this *Introduction*, an *Overview of Methods* details how we conducted the survey. The next five chapters present findings from the survey in the following areas:

- Attitudes toward gambling in Massachusetts
- Gambling behavior in Massachusetts
- Prevalence of problem gambling in Massachusetts
- Comparing recreational, at-risk, and problem gamblers in Massachusetts
- Awareness of problem gambling services in Massachusetts

The report concludes with a summary of the findings of the study and a discussion of the study's strengths and limitations, and considers possible future directions for analysis. There are several appendices to the report, including a detailed explanation of the study methodology, a copy of the questionnaire, and comprehensive tables that summarize the findings from most of the items in the survey.

[1] Thirteen respondents classified as problem gamblers had bet on sports in the past year and 23 respondents were sports bettors aged 18 to 24.

Overview of Methods

The Follow-up General Population Survey (FGPS) was completed in several stages. In the first stage of the project, the SEIGMA research team and staff from NORC at the University of Chicago worked together to finalize the questionnaire and sampling frame. Ethical approval for the study was obtained from both the NORC and the UMass Amherst Institutional Review Boards (IRBs). NORC programmed the questionnaire for computer-assisted web interviewing (CAWI) and computer-assisted telephone interviewing (CATI) administration, as well as creating a self-administered paper-and-pencil questionnaire (SAQ) and advance materials such as letters, postcards, and brochures. All materials were translated into Spanish and back-translated to verify consistency. In the second stage of the project, the surveys were administered and completed by 6,293 respondents between September 2021 and March 2022. The third stage of the project involved data cleaning and data weighting to increase confidence in generalizing results to the adult population of Massachusetts. The final stage of the project entailed drafting and finalizing this report.

In this section, we present an overview of the research methods used in the study. Additional information on the study methodology, intended for technical readers, is provided in Appendix B: Methods.

Ethical and Peer Review

The research protocol for the survey was reviewed separately by NORC's internal IRB and by the UMass Amherst IRB. All materials that respondents were expected to see (letters, brochures, postcards, and questionnaire) were submitted for review. These reviews ensured that the selection of respondents was appropriate, privacy was protected, informed consent was obtained, and safeguards were in place to protect the data. The NORC IRB approved the study protocol in July 2021 and the UMass Amherst IRB approved the protocol in September 2021. As data collection progressed, materials requiring modification or new materials not included in the original submissions were sent as amendments for review by both IRBs. In addition to IRB approval, NORC obtained a federal Certificate of Confidentiality for the survey from the National Institutes of Health.

The research plan and draft versions of this report were reviewed by the MGC's Research Review Committee. All of the feedback was carefully considered and incorporated in this final report.

Questionnaire Development and Description

The questionnaire for the FGPS was similar to questionnaires fielded in previous general population surveys carried out for the SEIGMA study. Some minor text changes were made to reflect changes in the availability of particular games or gambling venues. A number of items were added to enable an assessment of relative deprivation and to obtain information about sports betting participation, non-gambling expenditures at Massachusetts casinos, and the impact of the COVID-19 pandemic on gambling behavior. Several items were added to the survey to obtain information about smokeless tobacco and cannabis consumption.

The survey was offered in two versions which differed in the wording of several of the questions about gambling. In one version, all of the gambling participation questions were identical to the questions included in the Baseline General Population Survey. In the other version, questions about several gambling activities were modified to reflect the emergence of new forms or modes of gambling since the baseline survey was conducted. Half of the respondents received the original questions and half received the modified questions to allow for an assessment of the impact of wording changes on responses to questions about these types of gambling.

Once the questionnaire was finalized, the additional survey materials (any materials with changes from the baseline survey materials) were translated into Spanish. Both the English and Spanish language versions of the questionnaire were converted to a self-administered online format, self-administered paper-and-pencil format, and a computerized telephone format.

The FGPS was introduced to potential respondents as a survey of 'health and recreation,' to ensure that all adults contacted (both those who participated in gambling and those who did not) would be equally interested in completing the survey, as 'gambling surveys' reliably over-recruit heavy gamblers and under-recruit non-gamblers (Williams & Volberg, 2009). To increase the number of survey responses, the survey could be completed in three modes. First, the contacted adult was asked to complete the survey online using a key-code provided in the contact letter. If the survey was not completed online, a paper-and-pencil copy of the survey was sent to the household. Finally, if a response was not received to either the online survey or the paper-and-pencil survey, an attempt was made to complete the survey by telephone. This sequence of survey offerings maximized the opportunity for the survey to be self-administered, which is known to reduce the potential for bias.

Questionnaire Content

The questionnaire included sections on recreation, physical and mental health, alcohol and drug use, gambling attitudes, gambling behavior, gambling motivations, importance of gambling as a recreational activity, awareness of problem gambling services, gambling-related problems, and demographics. The sections of the questionnaire are described in more detail in Appendix B2: Fielding the SEIGMA Follow-up General Population Survey, and a copy of the questionnaire is included in Appendix C: Survey Questionnaire.

The Problem and Pathological Gambling Measure (PPGM) was the main instrument used to assess problem gambling in the survey (Williams & Volberg, 2010, 2014). The PPGM is a relatively new instrument that has superior construct validity as well as sensitivity, positive predictive power, diagnostic efficiency, and overall classification accuracy compared to other problem gambling instruments (Christensen, Williams, & Ofori-Dei, 2019; Molander & Wennberg, 2022; Williams & Volberg, 2010, 2014).[2] The Problem Gambling Severity Index (PGSI) was also included in the survey (Ferris & Wynne, 2001) to allow for comparisons with surveys in other jurisdictions that have included this widely used problem gambling instrument.

Sampling Strategy

To obtain a probability sample of all Massachusetts adults, Address Based Sampling (ABS) was used to ensure that all Massachusetts households had a positive probability of selection into the sample regardless of telephone ownership (landline, cell phone, or no telephone). Within each sampled dwelling unit, the adult with the most recent birthday was selected as the survey respondent.

The original sample for the survey included 30,740 housing units with a targeted yield of approximately 26% or 8,000 completes. Targets of 1,000 each were established for Asian non-Hispanics or Latinos and African-American non-Hispanics or Latinos. Targets of 1,120 and 1,400 were established for Hispanics or Latinos and young adults aged 18-29 years old regardless of race/ethnicity respectively. Because several of the targeted groups are comparatively rare in the state, predictive modeling and third-party auxiliary data were used to increase the likelihood of reaching individuals belonging to these groups.

[2] An updated version of the PPGM has recently been published (Gooding, Williams, & Volberg, in press).

Sample was initially released in two batches to allow for adjustments to the final batch in case yield rates across strata and demographic categories were lower than projected. When the first two batches returned fewer completes than projected, primarily because of oversampling of demographic groups with lower response propensity, an additional 16,500 cases were released for the web survey only starting in February 2022.

There were three primary considerations in determining the composition and sample size of the survey (see Appendix B1: Sample Size and Composition for detailed calculations). These included:

- The need to produce reliable estimates (i.e., relative standard error (RSE) of less than 30%) of problem gambling as a function of gender, age, and race/ethnicity.
- The need to be able to detect a minimum increase of 25% in the overall prevalence rate of problem gambling from the baseline survey.[3]
- The need to include a large enough subsample from (a) the Everett Host and Surrounding Communities so that a comparison could be made with the baseline targeted survey of Everett (which was a subsample from the baseline survey in 2013/2014) and (b) the Springfield Host and Surrounding Communities so that a comparison could be made with the baseline targeted survey of Springfield in 2015.

Data Collection Procedures

The survey launched in September 2021 and concluded in April 2022. Each sampled address followed a sequence of contacts until a completed survey was obtained, or some other final status (e.g., non-residential address, unscreened likely household, ineligible, partial interview) was determined. Mailings were scheduled approximately two weeks apart to give respondents enough time to receive and complete the questionnaire so that NORC could remove completed cases from follow-up mailings. Once selected, addresses were matched with landline telephone numbers to allow for telephone contact (the overall telephone match rate, including matches only to a street address for a multi-unit building, was approximately 74%).

All respondents were initially mailed a letter inviting them to participate in the survey online. The letter contained a $5 incentive and offered respondents a $10 Amazon gift-code if the survey was completed within 14 days. A thank-you or reminder postcard was mailed out one week after the advance letter. Two weeks later, a follow-up web letter was mailed out. If respondents had not completed the survey online four weeks after the advance letter, they were sent an SAQ along with an explanatory letter, a $5 incentive, and a return envelope. Two weeks later, a thank-you or reminder postcard was mailed out. After another two weeks, households received a second invitation letter along with a second copy of the questionnaire. Every address that failed to complete the survey via mail or online and whose household had been matched with a landline telephone number was then called and given the opportunity to complete the survey over the telephone as well as reminded of the online option. Telephone interviews were conducted by trained interviewers using a CATI system. A survey was considered complete if the individual responded to at least 7 of the 10 primary questions on participation in gambling.

The supplemental batch of addresses released in February 2022 was a web and CATI-only batch. These households received a pre-notification mailing, a reminder postcard, a follow-up web letter, and a final reminder postcard.

[3] The question of whether problem gambling prevalence **increased** in the wake of an increase in gambling availability was critical in the present study. To also detect a minimum **decrease** of 25% in the overall prevalence rate of problem gambling would have required a far larger sample (~12,000 respondents).

Sample Response Rate

A survey's response rate refers to the proportion of eligible individuals in the sample who actually complete a survey. The response rate is an important indicator of the potential for bias in surveys because it is possible that individuals who choose not to complete a survey may differ from those who do in meaningful ways. The weighted response rate for the FGPS was 27.5%. Interested readers can find additional information about response rates in Appendix B: Methods.

A total of 74.7% (n=4,701) of the questionnaires in the final sample were self-administered online, 23.6% were completed using the self-administered paper-and-pencil format (n=1,488), and 1.7% (n=104) were completed by telephone interview. In total, 98.3% of the Baseline Population Survey questionnaires were self-administered. A total of 718 self-administered questionnaires and/or telephone interviews (11.4% of the completed interviews) were completed in Spanish. Additional information about the sample and the data collection process is provided in Appendix B2: Fielding the SEIGMA Follow-up General Population Survey. Information about the sample construction and response rate is provided in Appendix B3: Sample Implementation and Response Rate.

Weighting and Imputation

The ultimate goal of a survey is to generate unbiased estimates of behaviors in the target population. We followed a standard survey research approach to weight the data so as to align the sample more closely with the target population. Data from the survey were weighted to account for the stratified survey design (wt1), differential screening rates associated with address characteristics (wt2), and response completion rates (wt3). Three additional steps were taken to create the final weights. First, weights were added to account for the number of household members aged 18 and over (wt4). Next, 2021 Census estimates of the MA 18+ population from PUMS data were used to form raking variables. An iterative raking process was used until marginal weights converged to PUMS totals (wt5). Finally, the impact of trimming the weight range was evaluated based on the accuracy of estimates of key variables. Weights were trimmed so that the minimum weight was 1/8th the average weight, and the maximum weight was 8 times the average weight (wt6). A detailed description of our data weighting procedures is included Appendix B4: Data Weighting Procedures.

Table 1 compares key demographic characteristics of the sample, both weighted and unweighted, along with information about the Massachusetts adult population. This is helpful to understand the impact of weighting on the results of the survey. A comparison of percentages in the weighted column and the Massachusetts 2021 column in the table shows a close match for gender and ethnicity. This is to be expected because these variables were used in the weighting. The comparison of percentages between columns for age and education is not as close, because the number of age and education groups used in weighting the sample was smaller than the number of groups displayed in Table 1.[4] A comparison for income shows a larger proportion of subjects with lower incomes in the weighted sample than occurs in the Massachusetts population. These observations suggest that the weighted survey results over-represent adults in lower income households in the population.

[4] Four age categories were used in the weighting procedure (18-34, 35-49, 50-64, 65+). Three education categories were used in the weighting procedure (high school or less, some college/college graduate, some postgraduate education).

Table 1. Demographics of follow-up general population survey sample

		FGPS sample						Massachusetts 2021[3]	
		Unweighted			Weighted				
		N[1]	%	SE	N[2]	%	SE	%	SE
Gender	Male	2,541	41.0	0.6	2,604,903	46.9	1.0	48.2	0.3
	Female	3,613	58.3	0.6	2,906,406	52.4	1.0	51.8	0.3
	Other	39	0.6	0.1	40,549	0.7	0.2	.	.
Age	18-20	105	1.8	0.2	156,355	3.0	0.4	5.6	0.1
	21-24	261	4.6	0.3	365,513	7.1	0.7	6.6	0.1
	25-34	990	17.4	0.5	959,051	18.6	0.9	17.5	0.2
	35-54	1,841	32.3	0.6	1,523,945	29.5	1.0	31.5	0.2
	55-64	981	17.2	0.5	986,020	19.1	0.9	17.1	0.2
	65-79	1,211	21.2	0.5	888,795	17.2	0.7	16.7	0.2
	80+	310	5.4	0.3	283,878	5.5	0.5	5.0	0.1
Ethnicity	Hispanic	855	15.0	0.4	593,414	11.5	0.6	11.1	0.2
	White alone	3,163	55.6	0.6	3,656,853	70.8	0.9	70.4	0.2
	Black alone	566	10.0	0.3	319,518	6.2	0.5	6.0	0.1
	Asian alone	867	15.3	0.4	382,217	7.4	0.4	7.1	0.1
	Some other race alone	50	0.9	0.1	47,496	0.9	0.2	1.3	0.1
	Two or more races	184	3.2	0.2	167,035	3.2	0.4	4.1	0.1
Education	Less than high school	188	3.2	0.2	304,315	5.7	0.6	9.0	0.2
	HS or GED	631	10.7	0.4	1,268,049	23.7	1.1	23.6	0.2
	Some college	1,392	23.5	0.5	1,087,210	20.3	0.8	24.1	0.2
	BA	1,652	27.9	0.6	1,592,447	29.8	0.9	24.4	0.2
	Graduate or professional degree	1,593	26.9	0.6	856,964	16.0	0.6	16.1	0.2
	PHD	463	7.8	0.3	242,294	4.5	0.3	2.8	0.1
Income	Less than $15,000	450	9.1	0.4	452,224	10.1	0.8	6.1	0.1
	$15,000 - <$30,000	488	9.9	0.4	481,979	10.8	0.8	6.6	0.1
	$30,000 - <$50,000	635	12.9	0.5	576,440	12.9	0.8	9.1	0.2
	$50,000 - <$100,000	1,356	27.6	0.6	1,175,773	26.3	1.0	23.4	0.2
	$100,000 -<$150,000	881	17.9	0.5	773,364	17.3	0.8	19.7	0.2
	$150,000 or more	1,109	22.5	0.6	1,005,561	22.5	0.9	35.1	0.2

[1] Unweighted N refers to the total number of respondents who selected this category for this question
[2] Weighted N is the total number of respondents who selected this category for this question weighted to the MA population
[3] Source: U.S. Census Bureau, 2021 American Community Survey PUMS

Item non-response was not a major issue in any of the data collection modes. Respondents were allowed to refuse to answer any question or to give a 'don't know' response. The percentage of complete responses was extremely high for nearly all items. For interested readers, the response rate for individual questions by data collection mode is shown in Appendix B5: Item Response Rate by Data Collection Mode. Household income was the only measure that had a non-response rate greater than 20%. Although household income is a candidate for imputation, no imputation was done for this report.

Data Cleaning and Statistical Analysis

NORC delivered the data to the SEIGMA research team via a secure file transfer protocol (SFTP). The dataset contained 47,240 records and included both complete and incomplete questionnaire responses. After review, incompletes were separated from the completed surveys and a partial dataset of incomplete surveys was

created (n=40,947). A second dataset of complete surveys (n=6,293) was created, carefully reviewed and cleaned. Several constructed variables were then created and added to the final dataset (n=6,293).

Statistical analysis of survey data where respondents have unequal weights is more complex than standard statistical analysis due to the need to properly account for the weights in estimating parameters and their variance. Special software and statistics have been developed for such situations and were used for this project. Details are provided in Appendix B4: Data Weighting Procedures.

Chi-square analysis and other nonparametric techniques were used to test for statistical significance in the sections of the report addressing gambling behavior, problem gambling prevalence and correlates of problem gambling. Descriptive statistics across the survey are presented in the sections of the report that follow. Multivariate analyses of these data are planned and results will be published in future reports and academic publications.

Reporting

In reporting results, we have used several conventions to make the interpretation of our results easier. For example, we adopted the approach used by the National Center for Health Statistics to identify and flag all estimates with a relative standard error (RSE) greater than 30% as not meeting standards for reliability. Standard error (SE) measures the extent to which a survey estimate is likely to deviate from the true value in the population; relative standard error is expressed as a percentage of the survey estimate. Within the report, estimates with RSE greater than 30% are suppressed and these cells are flagged as having not sufficient information (NSF). In appendices to the report, estimates with RSE greater than 30% are flagged with an asterisk but not suppressed to allow readers to judge these data for themselves. Another measure taken to enhance confidence in the results of the survey was to suppress values in any cells that contained less than five respondents. This was done in both the body of the report and in the appendices.

We have also chosen to present many of our results in graphic form. We have not included the categories of "Don't Know," "Refused," and "Other" in these graphics to make them easier to read. We have included all of the data in tables in the various appendices for readers who prefer a tabular format. In the body of the report, we have focused on six major demographic groups (i.e., gender, age, race/ethnicity, education, employment, annual household income). The tables in the appendices include additional demographic groups. Finally, we discuss differences between groups only when the overall test for group differences is statistically significant based on a chi-square or t-test with alpha of 0.05. The p-values for such tests are presented in the tables accompanying the text and in the appendices. Tables in the body of the report only include information about the size of unweighted groups to aid comprehension; all tables in the appendices include the sizes of weighted and unweighted groups.

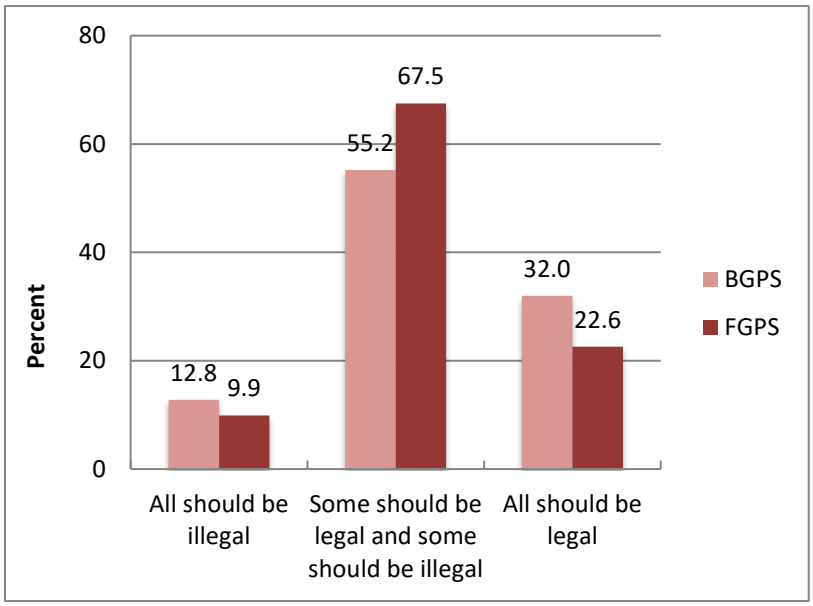
Attitudes toward Gambling in Massachusetts

Before examining gambling participation in the Massachusetts population, it is helpful to consider differences in attitudes toward gambling in Massachusetts. Respondents in the FGPS were asked several questions about their views of gambling. Questions assessed respondents' beliefs about legalized gambling in general, the availability of gambling in Massachusetts, the overall benefit or harm of gambling in society, and the most positive and negative impacts of casino gambling in Massachusetts.

Attitudes about Gambling Legalization

The majority of Massachusetts adults (67.5%) believed that some forms of gambling should be legal and some should be illegal, with only a minority reporting that all forms should be legal (22.6%) or all forms should be illegal (9.9%). Figure 2 presents changes in opinions about legalized gambling in Massachusetts since the baseline survey. All of the differences between the Baseline General Population Survey (BGPS) and the Follow-up General Population Survey (FGPS) in this figure are statistically significant although the effect sizes are small (0.25 to -0.21).[5]

Figure 2. Opinions about legalized gambling in Massachusetts



Note: This information is presented by demographics in Table 55 in Appendix D

This comparison suggests that opinions about legalized gambling in Massachusetts have changed since the baseline survey with significantly fewer people viewing legalized gambling favorably and unfavorably and significantly more people believing that some forms of gambling should be legal and some should be illegal.

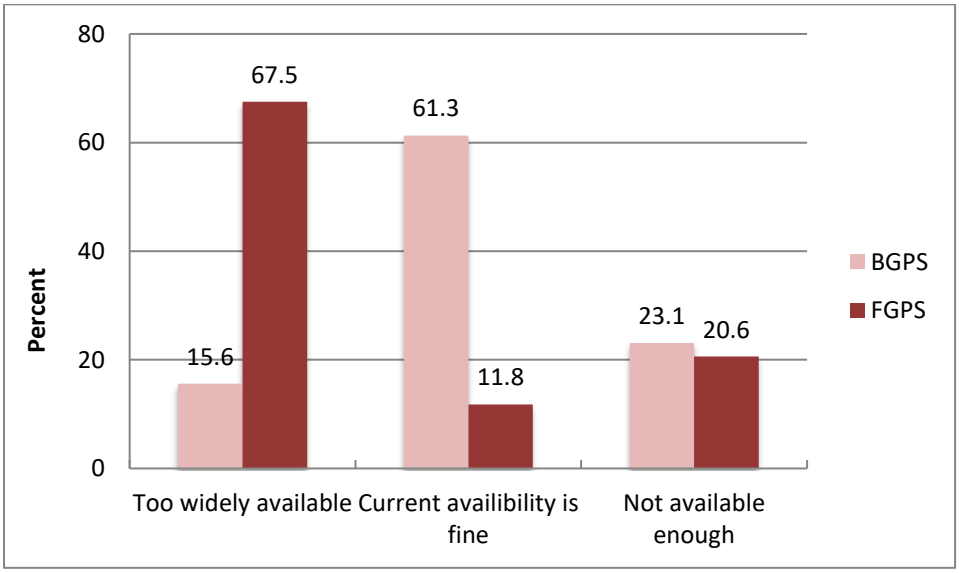
[5] Cohen's *h* was used to test for effect sizes and conventional cutoffs were used to determine whether the effects were small, medium or large (https://en.wikipedia.org/wiki/Cohen%27s_h).

Attitudes toward legalized gambling differed significantly across important subgroups in the Massachusetts population. Women in Massachusetts were significantly less likely than men to believe that all forms of gambling should be legal and more likely to believe that some forms should be legal and some forms illegal. Adults aged 21 to 24 were more likely to believe that some forms of should be legal and some illegal compared to adults aged 35 to 80. Hispanics, Blacks and Asians were more likely than Whites to believe that all forms of gambling should be illegal but Asians were significantly less likely than Hispanics, Blacks and Whites to believe that all forms of gambling should be legal. Individuals with less than a high school education were almost twice as likely as individuals with higher levels of education to believe that all gambling should be illegal. Students were significantly less likely than employed individuals to believe that all gambling should be legal and more likely to believe that some forms of gambling should be legal and some illegal. Disabled individuals were significantly less likely to believe that some forms should be legal and some illegal compared to employed individuals.

Beliefs about Gambling Availability

Figure 3 presents changes in opinions about the availability of gambling in Massachusetts since the baseline survey. The majority of Massachusetts adults (67.5%) believed that the availability of gambling in Massachusetts was too high, with 20.6% reporting that it was not available enough, and 11.8% reporting that the current availability was fine. This is a significant change compared to the baseline survey, before any casinos had become operational in Massachusetts and the effect sizes are large (1.12 to -1.10). While causation is difficult to prove, it is likely that this change reflects both the introduction of casinos in Massachusetts and the impending introduction of legalized sports betting.

Figure 3. Beliefs about gambling availability in Massachusetts



Note: This information is presented by demographics in Table 56 in Appendix D

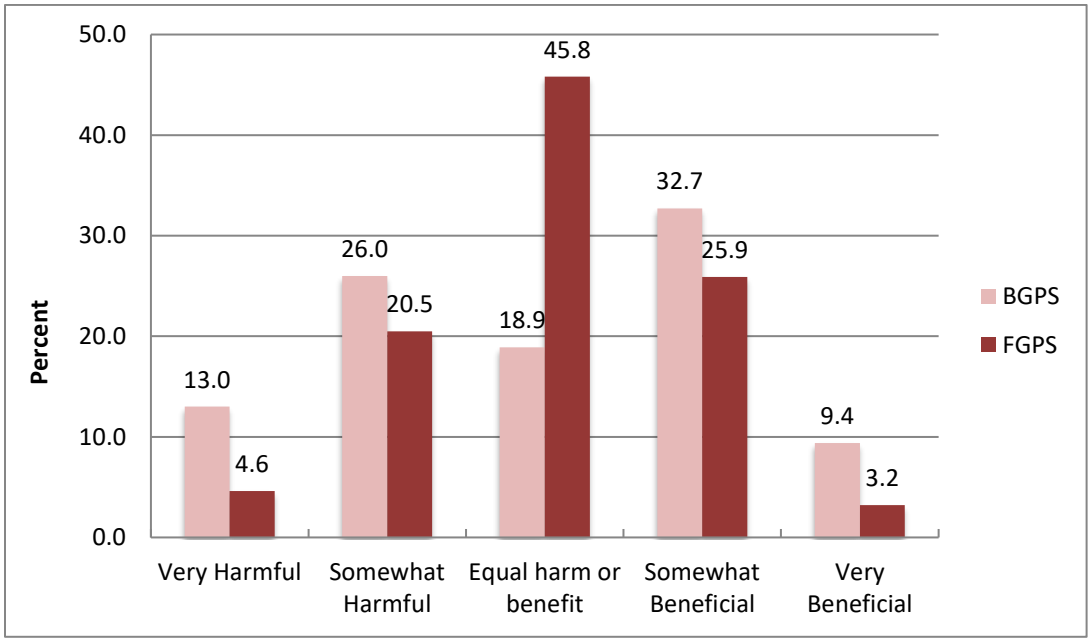
Beliefs about the availability of gambling in Massachusetts also differed significantly across subgroups in the Massachusetts population. Women were more likely than men to believe that gambling is too widely available in Massachusetts and less likely to believe that the current availability of gambling is fine. Adults aged 35 to 54 were less likely than adults aged 18 to 20 to say that gambling is too widely available in Massachusetts. Adults aged 25 to 54 were more likely than adults aged 65 to 79 to believe that the current availability of gambling is fine. Asians were more likely than Hispanics to believe that gambling is too widely available in Massachusetts and less likely than Hispanics or Whites to believe that the current availability of gambling is fine. Individuals

with less than a high school education were less likely than individuals who graduated high school to believe that gambling is too widely available in Massachusetts and more likely than those who graduated high school and those who graduated college to believe that gambling is not available enough. Retired individuals were less likely than employed individuals to believe that the current availability of gambling is fine. Employed individuals were less likely than retired and unemployed individuals to believe that gambling is not available enough. Individuals with annual household incomes of $100,000 to $150,000 were less likely than those with incomes less than $30,000 to believe that gambling is not available enough.

Perceived Impact of Expanded Gambling in Massachusetts

Massachusetts adults had mixed opinions about the impact of casinos in the state, with almost equal numbers of people believing the casinos had been harmful (25.1%) or beneficial (29.1%). Compared to the baseline survey, the largest change regarding the impact of expanding gambling in Massachusetts was in the proportion of adults who viewed the harms and benefits of casino gambling in the state as about equal. Nearly half of Massachusetts adults (45.8%) viewed the harms and benefits as about equal compared to only 18.9% of Massachusetts adults prior to the introduction of casinos in the state. It is worth noting that opinions in the baseline survey were based on expectations while opinions in the follow-up survey were based on observations. Figure 4 presents these results for the entire sample. All of the differences between the BGPS and the FGPS in this figure are statistically significant and effect sizes range from small to medium (-0.31 to 0.59).

Figure 4. Perceived impact of expanded gambling in Massachusetts



Note: This information is presented by demographics in Table 57 in Appendix D

Men were more likely than women to see the casino expansion in Massachusetts as beneficial. Asians were less likely than Whites, Hispanics or Blacks to see the expansion as beneficial. Individuals with a high school diploma were less likely than those with a doctorate to see casino expansion as harmful and more likely than those with a Master's degree or doctorate to see casino expansion as beneficial. Employed individuals as well as retired and disabled individuals were more likely to see casino expansion as beneficial compared to students. There were no differences in views about the impact of casinos in relation to age or household income. Table 57. Perceived impact of expanded gambling in Massachusetts in Appendix D presents the results with the responses grouped into three rather than five options.

Perceived Positive and Negative Impacts

All respondents were asked to identify the single most positive impact and the single most negative impact of casinos in Massachusetts. The most positive impacts of casinos in Massachusetts were viewed as employment (36.7%) followed by retaining money that was leaving Massachusetts (17.3%) and increased government revenue (14.3%). One in eight Massachusetts adults (12.6%) believed that there were no positive impacts of casinos in Massachusetts. The most negative impacts of casinos in Massachusetts were viewed as increased gambling addiction (45.1%) followed by increased traffic congestion (18.8%) and increased crime (10.7%). Similar to positive impacts, about one in ten Massachusetts adults (11.8%) believed that there were no negative impacts of casinos in Massachusetts. Table 58 and Table 59 in Appendix D present this information in tabular form.

Hypothesis Testing: H1

In considering how attitudes toward gambling might have changed between baseline and follow-up, we hypothesized that attitudes toward gambling would be **less negative** in the FGPS compared with the BGPS, reflecting Massachusetts adults' experience with casino gambling in the Commonwealth. To assess changes in attitudes toward gambling, we considered responses to the questions about the availability of gambling and the benefits or harms of expanded gambling in Massachusetts. This hypothesis is only **not supported** because a significantly greater proportion of Massachusetts adults believed that the current availability of gambling in the state was too high in 2021 compared with 2013. However, there was a noticeable shift toward the center in views about the harms and benefits of expanded gambling in Massachusetts with fewer people viewing expanded gambling as beneficial but also fewer people viewing expanded gambling as harmful.

Summary

In this section of the report, we have presented information about attitudes toward gambling in Massachusetts. Taken together, these results paint an incongruous picture of gambling attitudes in the Commonwealth; although most people support some legalization, they have mixed views about the benefits and harms of gambling. The most striking change since the introduction of casino gambling in Massachusetts is the increase in the proportion of Massachusetts adults who believed that gambling was too widely available. It is notable that this attitude prevailed prior to the legalization of sports betting in the Commonwealth.

In the next section of the report, we present detailed information about gambling involvement in Massachusetts.

Gambling in Massachusetts

This chapter examines gambling participation among adults in Massachusetts. To assess the full range of gambling available to Massachusetts residents, the survey included questions about 13 different activities. At the beginning of the survey, all respondents were given the same definition of gambling to assure comprehension and comparability of the results. Respondents were told:

> *We define gambling as betting money or material goods on an event with an uncertain outcome in the hopes of winning additional money or material goods. It includes things such as lottery tickets, scratch tickets, bingo, betting against a friend on a game of skill or chance, betting on horse racing or sports, investing in high risk stocks, etc.*

Respondents were then asked detailed questions about their participation in specific gambling activities, including whether they had:

- Purchased lottery tickets such as MegaMillions, Powerball, or Lucky for Life
- Purchased instant tickets or pull tabs
- Purchased daily lottery games such as Mass Cash, Keno, All or Nothing, or Numbers Game
- Purchased raffle tickets
- Bet money on sporting events (including sports pools)
    - Bet money on sports (including social betting, online betting, fantasy sports, and esports)[6]
- Gone to a bingo hall to gamble
- Gambled at a casino or slots parlor in Massachusetts
- Gambled at a casino, racino, or slots parlor outside of Massachusetts
- Bet on a horse race, at a racetrack or at an off-track site
- Bet money against other people on things such as card games, golf, pool, darts, bowling, video games, board games, or poker outside of a casino
- Purchased high risk stocks, options or futures, or day traded on the stock market
- Gambled online on things such as playing poker, buying lottery tickets, betting on sports, bingo, slots or casino table games for money, or playing interactive games for money

Questions about each activity covered past-year participation, frequency of participation, and amount spent in a typical month. In assessing participation in casino gambling, additional questions assessed whether respondents spent money on non-gambling activities, which casino they went to most often, and whether they gambled on electronic gambling machines (EGMs) and/or casino table games. Only past-year participation and typical monthly spending on online gambling were assessed; information was not obtained regarding frequency of participation in online gambling.

[6] Half of the survey respondents were asked about sports betting in the same way as in the BGPS; the other half were asked about sports betting in more detail. The SEIGMA team plans to examine the impact of these wording differences on reported behavior in future analyses.

Gambling Participation

Table 2 presents past-year participation for all of the types of gambling included in the survey (except high-risk stocks, which is not universally viewed as a form of gambling). In addition to summing yearly participation in all forms of gambling, the table provides a sum of participation in the three major forms of lottery in the state: traditional lotteries, instant games (scratch tickets and pull tabs), and daily lottery games. The table shows that past-year participation among Massachusetts adults was highest for lottery games, raffles and casino gambling. Four in ten Massachusetts adults (43.3%) purchased traditional lottery tickets and about one quarter (26.6%) purchased instant tickets. Participation in daily lottery games (14.5%) was substantially lower than other forms of lottery but about the same as at baseline. One in five Massachusetts adults (18.6%) purchased raffle tickets in the past year; one in six Massachusetts adults (15.7%) gambled at a casino in the past year; one in ten Massachusetts adults bet on sports; and one in fifteen Massachusetts adults wagered privately. Past-year participation rates for horse race betting, bingo, and online gambling were even lower.

Table 2. Percentage of past-year gambling participation by gambling activity

		Past Year Participation	
	Unweighted N[1]	%[2]	95% CI[2]
All gambling	6,184	60.2	(58.3, 62.2)
All lottery	6,258	47.6	(45.6, 49.6)
Traditional	6,281	43.3	(41.3, 45.3)
Instant games	6,268	26.6	(24.8, 28.4)
Daily games	6,258	14.5	(13.1, 16.0)
Raffles	6,267	18.6	(17.2, 20.2)
Casinos either in or out of state[3]	5,957	15.7	(14.3, 17.3)
Only casinos out of state	5,944	4.3	(3.6, 5.3)
Only casinos in MA	5,940	5.1	(4.3, 6.1)
Casinos both in & out of state	6,071	5.6	(4.7, 6.7)
Sports betting	6,259	9.9	(8.6, 11.2)
Private wagering	6,234	6.7	(5.7, 7.8)
Horse racing	6,236	2.6	(2.0, 3.3)
Bingo	6,268	2.1	(1.5, 2.8)
Online	6,232	2.7	(2.0, 3.5)

[1] Unweighted N refers to the total number of respondents who answered this question

[2] Percentages and 95% CI are calculated using the weighted N

[3] This group includes 30 individuals with a missing answer for one of the questions about gambling at casinos in MA or out of state

Table 3 presents changes in past-year participation for all of the types of gambling included in the Baseline General Population Survey (BGPS) and the Follow-up General Population Survey (FGPS). The table shows that past-year participation among Massachusetts adults declined significantly for the majority of gambling activities although all of the effect sizes are small (-0.30 to 0.07). Daily lottery games and online gambling were the only types of gambling where past-year participation did not decline significantly. Although overall gambling participation declined by 17.7%, the greatest declines were in raffles (41.0%), private wagering (39.6%), and bingo (38.2%). Declines in past-year purchases of instant lottery tickets and traditional lottery tickets as well as participation in casino gambling, horse racing, and sports betting ranged from 21.4% to 28.5%.

Table 3. Changes in past-year gambling participation by gambling activity

	BGPS Past Year Participation		FGPS Past Year Participation		% Change[1]
	%[3]	95% [3]CI	%[3]	95% [3]CI	
All gambling	73.1	(71.8, 74.4)	60.2*	(58.3, 62.2)	17.7
All lottery	61.7	(60.2, 63.1)	47.6*	(45.6, 49.6)	22.9
Traditional	58.1	(56.6, 59.5)	43.3*	(41.3, 45.3)	25.5
Instant games	37.2	(35.8, 38.7)	26.6*	(24.8, 28.4)	28.5
Daily games	14.1	(13.1, 15.2)	14.5	(13.1, 16.0)	-2.8
Raffles	31.5	(30.2, 32.8)	18.6*	(17.2, 20.2)	41.0
Casinos either in or out of state[2]	21.5	(20.3, 22.7)	15.7*	(14.3, 17.3)	27.0
Only casinos out of state			4.3	(3.6, 5.3)	
Only casinos in MA	NA		5.1	(4.3, 6.1)	
Casinos both in & out of state	NA		5.6	(4.7, 6.7)	
Sports betting	12.6	(11.6, 13.7)	9.9*	(8.6, 11.2)	21.4
Private wagering	11.1	(10.1, 12.2)	6.7*	(5.7, 7.8)	39.6
Horse racing	3.4	(2.9, 4.0)	2.6	(2.0, 3.3)	23.5
Bingo	3.4	(2.9, 4.0)	2.1*	(1.5, 2.8)	38.2
Online	1.6	(1.2, 2.1)	2.7	(2.0, 3.5)	-68.8

*Indicates significant change from Baseline

[1] Percent change calculated by subtracting FGPS from BGPS and dividing result by BGPS

[2] This group includes 30 individuals with a missing answer for one of the questions about gambling at casinos in MA or out of state

[3] Percentages and 95% CI are calculated using the weighted N

For context, it is helpful to compare gross gaming revenues derived from different types of gambling in Massachusetts in the two survey periods (2013-2014 and 2021-2022). The table below (Table 4) presents this information for the main types of gambling in the Commonwealth. The table shows that charitable gambling revenues declined substantially between 2013 and 2021, racing revenues remained stable and lottery revenues grew. While the change in revenues for charitable gambling aligns with a reduction in participation in this type of gambling, this is not true for either racing or the lottery.

Table 4. Comparing gross gaming revenues in 2013-2014 and 2021-2022

	Year Type	Gross Gaming Revenue 2013-2014	Gross Gaming Revenue 2021-2022	% Change
Charitable	Calendar Year	$66 million	$37.9 million	-42.6
Horse and dog racing	Calendar Year	$277 million	$294 million	6.1
Lottery	Fiscal Year	$4.9 billion	$5.86 billion	19.6

Hypothesis Testing: H2

In considering how gambling participation might have changed between 2013 and 2021, we hypothesized that participation in casino gambling would be **higher** in the follow-up survey compared with the baseline survey, reflecting the impact of the introduction of casinos in Massachusetts. This hypothesis is **not supported** because past-year participation in casino gambling declined significantly between the two surveys. However, as discussed below, we believe that the COVID-19 pandemic had some influence on these decreased rates.

Hypothesis Testing: H3

We also hypothesized that participation in lottery games would be **lower** in 2021 than in 2013, reflecting shifts in gambling participation and expenditures following the introduction of casinos in Massachusetts. Because participation in traditional, large-jackpot lottery games and instant scratch tickets was lower in the FGPS compared with the BGPS, this hypothesis is **partly supported** although it is not clear whether these changes were due to the introduction of casinos in Massachusetts or to the lingering impacts of COVID-19 in 2021 and 2022 when the FGPS was in the field.

Impact of COVID-19 on Gambling Participation

Three things were examined in order to evaluate the potential impact of COVID-19 on FGPS survey results. The first was an examination of the specific time frames involved:

- The FGPS was fielded between September 2021 and April 2022. However, 75% of participants completed the survey between September 2021 and January 2022 (50% between September 2021 and November 2021). It must also be remembered that survey participants were reporting on their past 12 months of behavior. This means that 75% of people were reporting on gambling behavior that occurred between September 2020 and January 2022.
- Phase III COVID -19 restrictions that were in effect from July 2020 until March 2021 limited indoor gatherings to 8 people per 1,000 square feet and no more than 25 people in a single enclosed indoor space (e.g., casinos still had a 40% capacity limit) and limited outdoor gatherings in enclosed spaces to 25% of the facility's maximum permitted occupancy, with a maximum of 100 people in a single enclosed outdoor space. There was also a major resurgence in COVID-19 in November 2020 that resulted in new statewide restrictions for capacity, mask compliance and distancing. It was not until May 2021 that all COVID-19 restrictions were rescinded for all gaming establishments (which is also the month that casino revenue returned to pre-COVID-19 levels).

The second was an examination of how well changes in the general population surveys (BGPS, FGPS) were correlated with changes in the online panel surveys: the Baseline Online Panel Survey (BOPS) that was fielded in the same time frame as the BGPS (i.e., October 2023 – March 2014) and the Follow-Up Online Panel Survey (FOPS), that was fielded in a similar time frame as the FGPS (i.e., March 2022). If gambling participation rates in the online panel surveys changed in ways similar to the general population surveys, we anticipated that data from our most recent online panel survey completed in March/April 2023 (Online Panel Survey 2023; OPS23) would be helpful in understanding whether the differences between the BGPS and the FGPS were better explained by COVID-19 (in which case gambling participation rates would be higher in OPS23 compared with FOPS) or by longer term trends (in which case gambling participation rates would remain steady or decline further in OPS23 compared to FOPS). The caveat is that online panel participants constitute heavier gamblers, and thus, decreases were expected to be more modest:

- We identified a strong relationship (r = .88) in changes in the BGPS – FGPS compared to changes in the BOPS – FOPS. A total of nine out of 11 types of gambling decreased in the FGPS compared to the BGPS (8/11 significantly) and four out of 11 types of gambling decreased in the FOPS compared to the BOPS (4/11 significantly) (see Table 61 in Appendix E).
- Importantly, 12/12 types of gambling increased in the OPS23 relative to the FOPS (10/12 significantly).

The third involves answers specifically to several questions pertaining to COVID-19 impacts. Table 5 presents responses to several questions included in the FGPS to try and directly assess the impact of the pandemic on overall gambling participation and on online gambling specifically as well as whether respondents spent COVID-19 stimulus funds on gambling. The table shows that approximately two in ten past-year online gamblers (19.7%) felt that COVID-19 increased their online gambling participation, which is supported by the apparent,

but not statistically significant, increase in past-year online gambling participation. The majority of past-year gamblers (80.3%) felt that the pandemic had no impact on their gambling in the past year, a larger proportion (12.3%) reported they gambled less due to the pandemic compared to the proportion (3.7%) who gambled more due to the pandemic. This is supported by the overall decrease in past-year gambling participation as well as decreases in specific types of gambling in Massachusetts between 2013 and 2021. Finally, it is notable that the majority of past-year gamblers (57.5 %) used money from their COVID-19 stimulus payments to gamble.

Table 5. Impact of COVID-19 on past-year gamblers

		Unweighted N[1]	%	95% CI[2]
COVID increased online gambling in past year	NO	111	80.3	(70.6, 87.4)
	YES	44	19.7	(12.6, 29.4)
Impact COVID had on gambling in past year	It has had no impact on my gambling	2,944	80.3	(82.1, 85.8)
	Overall, I have gambled less	475	12.3	(10.7, 14.1)
	Overall, I have gambled more	155	3.7	(2.9, 4.8)
Use any $ from COVID stimulus check to gamble	No	856	25.2	(23.1, 27.5)
	Yes	2,213	57.5	(54.9, 60.0)
	I did not receive any stimulus money	666	17.3	(15.5, 19.3)

[1] Unweighted N refers to the total number of respondents who answered this question

[2] Percentages and 95% CI are calculated using the weighted N

Taken together, the above results confirm that COVID-19 and the associated restrictions almost certainly had some impact on prevalence rates of gambling participation in the FGPS and that gambling participation has likely increased since the FGPS was completed. That said, there is evidence that some of the FGPS decreases have likely continued, as only six out of 11 types of gambling were higher in the OPS23 compared to the BOPS but past-year participation in raffles remained significantly lower in OPS23 compared with the BOPS. It is worth noting that COVID-19 likely affected the behavior of recreational gamblers to a greater extent than those experiencing gambling problems because it is more difficult for heavy gamblers to change their behavior in response to changing circumstances.

Gambling Expenditures

Gambling expenditure is an important measure of gambling participation. However, surveys have consistently obtained significant mismatches between self-reports of gambling expenditure and actual gambling revenue (Volberg, Gerstein, Christiansen, & Baldridge, 2001; Williams & Wood, 2007; Wood & Williams, 2007). There are several reasons for this lack of correspondence between reported expenditure and actual revenue, including the way in which expenditure questions are asked, respondents' needs to appear socially desirable, and faulty perceptions of wins and losses (Blaszczynski, Dumlao, & Lange, 1997; Volberg et al., 2001; Williams, Belanger, & Arthur, 2011; Wood & Williams, 2007). Despite these limitations, research has shown that there are certain ways of asking gambling expenditure questions that produce a better match to actual revenue (Williams, Volberg, Stevens, Williams, & Arthur, 2017; Wood & Williams, 2007). These wordings have been used in SEIGMA since its inception. A detailed summary of the limitations of self-reported expenditure data is presented in Appendix E1: Gambling expenditure data.

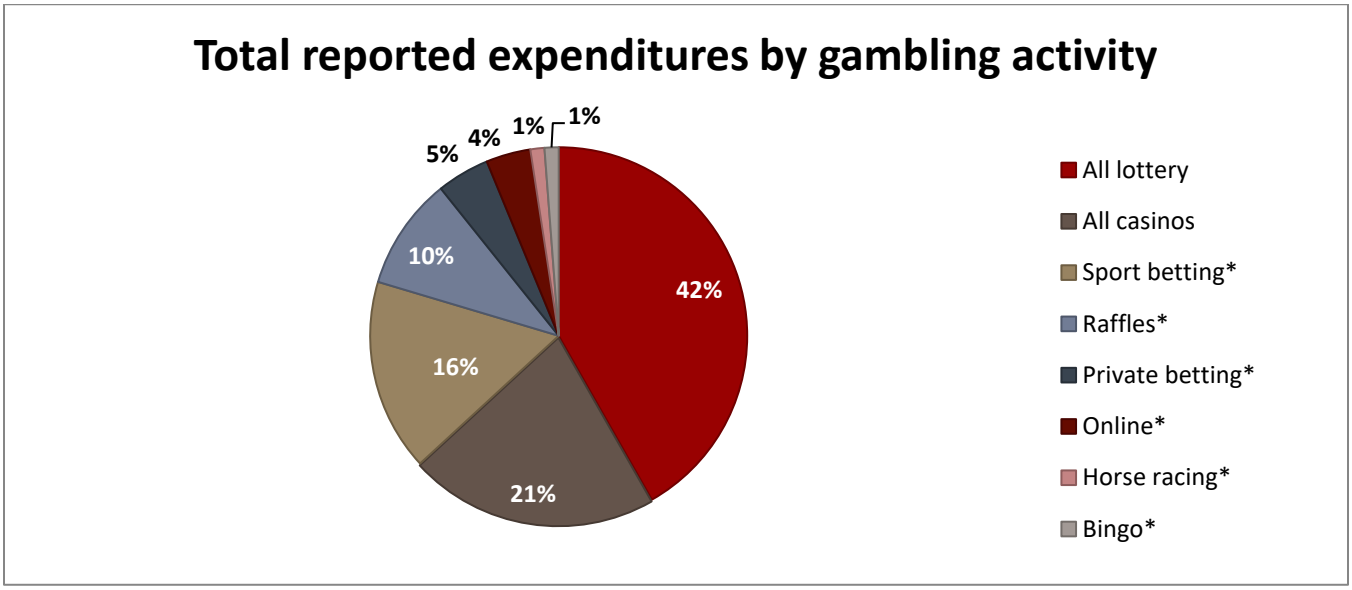
Assessing Gambling Expenditures in Massachusetts

To assess gambling expenditures in Massachusetts, respondents in the survey who reported participating in a specific form of gambling in the past year were asked "Roughly how much money do you spend on [gambling activity] in a typical month?" At the beginning of this section of the survey, all respondents were given the same definition of spending. Respondents were told:

Spending means how much you are ahead (+$) or behind (-$), or your net win or loss in an average month within the past 12 months.

Thus, if a respondent felt that he/she was an overall winner in a typical month, the amount could be reported as a 'win' rather than as a 'loss.' All reported wins were recoded as zero and all statistical outliers were winsorized[7] with values truncated to four standard deviations from the mean. We then examined the proportion of reported expenditures for each of the gambling activities included in the survey. Figure 5 illustrates the proportion of total reported expenditures derived from each of these activities.

Figure 5. Total reported expenditures on different gambling activities



Note: An asterisk * indicates estimates are unreliable, relative standard error > 30%
Note: These data were truncated by 4 standard deviations from the mean to account for extreme outliers
Note: This information is presented in detail in Table 60 in Appendix E

Figure 5 illustrates that relative to other gambling activities, respondents reported spending the largest proportion of money (42%) on the lottery. This is not surprising given the popularity and success of the Massachusetts Lottery. After the lottery, respondents reported spending the largest proportion of money at casinos (21%). This includes casinos in Massachusetts as well as casinos in other jurisdictions. It is interesting that respondents reported spending a substantial amount on sports betting (16%) although only daily fantasy sports (DFS) was legal in Massachusetts at the time of the survey. Taken together, this figure illustrates that relative to other forms of gambling, lottery play, casino gambling and sports betting were the gambling activities with which respondents were most engaged, followed by raffles, private wagering, online gambling, horse racing and bingo.

It is interesting to compare the proportion of total expenditures by gambling activity in the FGPS with the same results from the BGPS. Lottery expenditures accounted for the majority of spending on gambling in both surveys but the proportion spent on lottery products was much higher (65%) in the BGPS. The proportion of spending on casinos was higher in the FGPS compared to the baseline (17%) which may reflect the greater availability of casinos in Massachusetts in 2021 compared with 2013. It is notable that the proportion of spending on sports betting in the FGPS was three times greater than in the BGPS (5%). The proportion of spending on raffles, private

[7] Winsorizing is a common method for dealing with outliers by replacing these values with the nearest non-outlier values.

wagering and online gambling was also higher in the FGPS compared with the BGPS but the proportion spent on bingo was higher at baseline than at follow-up.

Demographics of Specific Gambling Activities

There were important differences in the demographic characteristics of individuals who engaged in specific gambling activities in the past year. This section of the report summarizes information presented in detail in Table 62 to Table 72 in Appendix E. For easier interpretation, demographic differences are presented for each gambling activity in tabular form. Only statistically significant differences are shown in the tables summarizing differences in player characteristics in this section of the report. In some instances, these differences relate to specific demographic subgroups rather than to the group as a whole.

Lottery

Although respondents who participated in any type of lottery game in the past year were quite similar to the general population of Massachusetts, there were nevertheless some interesting differences. The table below (Table 6) shows that there were significant differences by gender, age, race/ethnicity, education and employment among past-year lottery players.

Table 6. Significant differences among lottery players

More likely	Less likely
Men	Women
35-79	18-34
White, Hispanic, Black	Asian
Less than PhD	PhD
Employed, unemployed, retired, disabled	Student

Note: Table 62 presents this information in detail.

Respondents who had played the lottery in the past year participated in an average of 0.9 other gambling activities in the past year (see Table 73 in Appendix E). The gambling activities that past-year lottery players were most likely to have participated in within the past year included purchasing raffles (28.4%) and going to a casino (25.6%).

When it comes to specific lottery games, there were differences in the demographic characteristics of these players. The following table (**Error! Reference source not found.**) presents information about the demographic characteristics of individuals who played specific lottery games. The table shows that there were significant differences by gender, age, race/ethnicity, education, employment and household income among past-year players of specific lottery games.

Table 7. Significant differences among players of specific lottery games

	More likely	Less likely
Traditional lottery (MegaMillions, Powerball, Lucky for Life)	Men	Women
	35 -79	21-34
	White	Asian
	Some college	BA and higher
	Employed, unemployed, retired, disabled	Student

	More likely	Less likely
Instant lottery	35 and older	25-34
	White, Hispanic, Black	Asian
	Some college or less	BA and higher
	Employed, unemployed, retired, disabled	Student
	Disabled	Employed
	HH income up to $100K	HH income $150K+
Daily lottery (MassCash, Keno, All or Nothing, Numbers Game)	Men	Women
	35 and older	25-34
	55-64	35-54
	HS to BA	Master's

Note: Table 63 to Table 65 present this information in detail.

Raffles

The table below (Table 8) shows that there were significant differences by age, race/ethnicity, education and household income among individuals who had purchased raffle tickets in the past year. In contrast to many other gambling activities, there was no gender difference in purchase of raffle tickets in the past year.

Table 8. Significant differences among raffle players

More likely	Less likely
35-79	25-34
White	Hispanic, Black, Asian
Some college, BA or MS	Less than HS
HH income $150,000+	HH income up to $100,000

Note: Table 66 presents this information in detail.

Respondents who purchased raffle tickets in the past year participated in an average of 1.4 other gambling activities in the past year (see Table 73 in Appendix E). The gambling activities that past-year raffle participants were most likely to have participated in include playing the lottery (72.5%) and going to a casino (26.0%).

Casino

The table below shows that there were significant differences by education and employment status among individuals who had gambled at a casino in the past year. In contrast to many other gambling activities, there was no gender difference among people who gambled at a casino in the past year. There were also no significant differences in past-year casino gambling by age or race and ethnicity.

Table 9. Significant differences among casino gamblers

More likely	Less likely
Bachelor's or less	Master's, PhD
Employed	Student

Note: Table 67 Table 62presents this information in detail.

The demographic characteristics of past-year casino players in 2021 are different than the demographic characteristics of past-year casino gamblers in 2013 when males were more likely than females and young adults (25-34) were more likely than other age groups to have gambled at a casino in the past year. In 2013, respondents with a high school diploma and those with a graduate degree were less likely to have gambled at a

casino in the past year compared to respondents who had attended some college or attained a Bachelor's degree.

As shown in Table 2, there was a proportion of past-year casino gamblers who patronized both Massachusetts and out-of-state casinos as well as a proportion who patronized only out-of-state casinos (5.6% and 4.3% of Massachusetts adults respectively). When asked which state they most often went to for casino gambling, the majority of past-year casino gamblers who had patronized casinos outside of Massachusetts (42.7%) reported going to Connecticut. Another 11.3% reported going to Rhode Island and 6.7% reported going to Nevada to gamble at a casino. Table 10 shows differences in the states that past-year casino gamblers were most likely to have patronized in 2013 and 2021. Effect sizes for these comparisons were all small (-0.42 to 0.03) except for Missing (which had a medium effect size of 0.60). In both 2013 and 2021, casino gamblers were most likely to have patronized casinos in Connecticut and Rhode Island, followed by Nevada.

Table 10. States in which respondents most often visited casinos

	BGPS		FGPS	
	%[1]	95% CI[1]	%[1]	95% CI[1]
Massachusetts	NA		11.0	(9.8, 12.4)
Outside Massachusetts	21.5	(20.3, 22.7)	10.2*	(9.0, 11.6)
Connecticut	63.3	(60.1, 66.4)	42.7*	(36.2, 49.4)
Rhode Island	11.3	(9.4, 13.7)	11.3	(8.1, 15.6)
Nevada	6.9	(5.4, 8.8)	6.7	(4.4, 9.9)
Other	13.9	(11.9, 16.1)	15.1	(11.6, 19.4)
Missing	4.6		24.3	

[1] Percentages and 95% CI are calculated using the weighted N
*Indicates significant change from BGPS
Note: Numbers from BGPS recalculated to take missing into account

One important reason for the introduction of casinos in Massachusetts was to recapture out-of-state spending on casino gambling. It is clear from the responses above that there was a significant decrease in out-of-state casino patronage (from 21.5% in 2013 to 10.2% in 2021) with most of the reduction occurring in the patronage of Connecticut casinos.

Respondents who had gambled at a casino in the past year participated in an average of 1.7 other gambling activities in the past year (see Table 73 in Appendix E). The gambling activities that past-year casino gamblers were most likely to have engaged in were playing the lottery (77.0%) and purchasing raffles (30.8%).

Sports Betting

Table 11 below shows that there were significant differences by gender, age, race/ethnicity, employment status and household income among individuals who had bet on sports in the past year. When compared to sports bettors in 2013, there were no differences in sports bettors based on education in 2021. In 2013, sports bettors were less likely to be homemakers, disabled, or retired and more likely to be employed. Differences in household income were similar in 2013 and 2021.

Past-year sports bettors participated in an average of 2.1 other gambling activities in the past year (see Table 73 in Appendix E). The gambling activities that past-year sports bettors were most likely to have done include playing the lottery (69.5%) and going to a casino (40.1%). In 2013, past-year sports bettors were most likely to have played the lottery (82.5%) and purchased raffles (55.4%).

Table 11. Significant differences among sports bettors

More likely	Less likely
Men	Women
25-54	65 and over
White	Hispanic, Asian
Employed	Retired
HH income $150,000+	HH income $30,000-$50,000

Note: Table 68 presents this information in detail.

Additional information about sports betting in Massachusetts is available in a separate SEIGMA report (Volberg, Evans, Zorn, & Williams, 2022).

Private Wagering

The table below shows that there were significant differences by gender, age, and employment status among individuals who had wagered privately in the past year.

Table 12. Significant differences among private wagerers

More likely	Less likely
Men	Women
25-34	65 and over
Employed, student	Retired

Note: Table 69 presents this information in detail.

Respondents who wagered privately in the past year participated in an average of 2.0 other gambling activities in the same timeframe (see Table 73 in Appendix E). The gambling activities that past-year private gamblers were most likely to have done include playing the lottery (61.7%) and betting on sports (45.0%). Other gambling activities that respondents who wagered privately in the past year were likely to have done include going to a casino (34.3%) and purchasing raffles (32.6%).

Horseracing

Like sports bettors and private gamblers, men were significantly more likely to be past-year horse race bettors than women. Due to the low overall rate of participation, we were unable to detect any other differences in the demographic characteristics of horse race bettors.

Respondents who gambled on horse races in the past year participated in an average of 3.0 other gambling activities in the same period (see Table 73 in Appendix E). The gambling activities that past-year horse race bettors were most likely to have done include playing the lottery (79.4%), going to a casino (66.2%), wagering on sports (58.3%) and purchasing raffles (41.6%).

Bingo

Bingo is the only gambling activity included in the survey where women were more likely to be past-year participants than men. As with horse racing, the low overall rate of participation in bingo made it impossible to detect any other differences in the demographic characteristics of bingo players.

Past-year bingo players participated in an average of 2.5 other gambling activities in the same timeframe (see Table 73 in Appendix E). The gambling activities that bingo players were most likely to have done include playing the lottery (67.9%), going to a casino (61.1%), and purchasing raffles (56.5%).

Online Gambling

The profile of online gamblers in Massachusetts is similar to the profile of online gamblers in many other jurisdictions (Williams, Wood, & Parke, 2012) with men more likely to gamble online than women. As with horse racing and bingo, the low overall rate of online gambling made it impossible to detect any other differences in the demographic characteristics of online gamblers.

Online gamblers tend to be heavily involved land-based gamblers who have added online gambling to their established repertoire of gambling activities. In the present study, respondents who gambled online in the past year participated in an average of 2.6 other land-based gambling activities in that period (see Table 73 in Appendix E). The gambling activities that online gamblers were most likely to have participated in include playing the lottery (72.6%), wagering on sports (63.4%), and going to a casino (38.5%).

Patterns of Gambling Participation

To understand patterns of gambling participation, it is helpful to examine the demographics of respondents who wager at increasing levels of frequency. To analyze levels of gambling participation, respondents were divided into four groups:

- ***non-gamblers*** who have not participated in any type of gambling in the past year (39.8% of the total sample);
- ***past-year gamblers*** who have participated in one or more types of gambling in the past year but not on a monthly or weekly basis (33.5% of the total sample);
- ***monthly gamblers*** who participate in one or more types of gambling on a monthly, but not weekly basis (14.6% of the total sample); and
- ***weekly gamblers*** who participate in one or more types of gambling on a weekly basis (12.1% of the total sample).

Table 13 presents past-yearly, monthly, and weekly participation for all of the types of gambling included in the Massachusetts survey (except high-risk stocks, which is not universally viewed as a form of gambling). The table shows that the majority of monthly and weekly gambling participation among Massachusetts adults is explained by lottery participation, including traditional lottery games and instant games. Very few Massachusetts adults gambled at casinos more than a few times a year. After lottery play, betting on sports was the most common weekly and monthly gambling activity followed by raffles and private wagering.

Table 13. Frequency of gambling participation by gambling activity

	Unweighted N[1]	Past year participation[3] %[2]	95% CI[2]	Monthly participation[4] %[2]	95% CI[2]	Weekly participation %[2]	95% CI[2]
All gambling	6,184	60.2	(58.3, 62.2)	26.7	(24.9, 28.6)	12.1	(10.8, 13.5)
All lottery	6,258	47.6	(45.6, 49.6)	21.6	(20.0, 23.4)	9.3	(8.2, 10.6)
Traditional	6,281	43.3	(41.3, 45.3)	18.3	(16.7, 20.0)	7.3	(6.3, 8.4)
Instant games	6,268	26.6	(24.8, 28.4)	11.3	(10.1, 12.7)	4.5	(3.7, 5.4)
Daily games	6,258	14.5	(13.1, 16.0)	5.5	(4.6, 6.5)	2.5	(1.9, 3.3)
Raffles	6,267	18.6	(17.2, 20.2)	2.7	(2.2, 3.4)	0.8	(0.5, 1.1)
Casinos either in or out of state[5]	5,957	15.7	(14.3, 17.3)	1.0	(0.6, 1.5)	NSF	
Only casinos out of state	5,944	4.3	(3.6, 5.3)	NSF		NSF	
Only casinos in MA	5,940	5.1	(4.3, 6.1)	NSF		NSF	
Casinos both in & out of state	6,071	5.6	(4.7, 6.7)	NSF		NSF	
Sports betting	6,259	9.9	(8.6, 11.2)	4.6	(3.7, 5.7)	2.8	(2.1, 3.7)
Private wagering	6,234	6.7	(5.7, 7.8)	2.3	(1.7, 3.1)	0.7	(0.4, 1.3)
Horse racing	6,236	2.6	(2.0, 3.3)	NSF		NSF	
Bingo	6,268	2.1	(1.5, 2.8)	0.8	(0.5, 1.3)	NSF	
Online	6,232	2.7	(2.0, 3.5)	NA		NA	

[1] Unweighted N refers to the total number of respondents who answered this question
[2] Percentages and 95% CI are calculated using the weighted N
[3] Includes respondents who participate yearly, monthly or weekly
[4] Includes respondents who participate monthly or weekly
[5] This group includes 30 individuals with a missing answer for one of the questions about gambling at casinos in MA or out of state
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Like specific gambling activities, gambling frequency in Massachusetts was associated with gender, age, race/ethnicity, educational attainment, employment status, and household income. Table 74 in Appendix E presents the results summarized below in tabular form.

Table 14. Significant differences among gamblers by frequency

	More likely	Less likely
Non-gamblers	Women	Men
	18-34	55 and older
	Hispanic, Black, Asian	White
	Students, homemakers	Employed, retired
	$15,000 or less	$150,000 or more
Past year gamblers	Women	Men
	White	Hispanic, Black
	Some college or higher	HS or less
	Employed	Retired, disabled
Monthly gamblers	White, Hispanic, Black	Asian
	HS or GED	Bachelor's or Master's
	Some college	Bachelor's
	Employed, unemployed, retired, disabled	Students
Weekly gamblers	Men	Women
	55 and older	25-34
	White, Black	Asian
	HS or GED	Bachelor's or Master's
	Retired	Employed

Note: Table 74 presents this information in detail.

Monthly Participation

Table 15 presents information about monthly gambling participation rates in the BGPS and the FGPS for all of the types of gambling included in the Massachusetts surveys (except high-risk stocks). This table shows that rates of monthly participation for almost all forms of gambling in Massachusetts were significantly higher in 2013 than in 2021 although effect sizes were small (-0.27 to 0.03). The only forms of gambling where monthly participation was *not* significantly lower in 2021 were daily lottery games, casinos, sports betting and bingo.

Table 15. Changes in monthly gambling participation by gambling activity

	BGPS Monthly Participation		FGPS Monthly Participation	
	%[2]	95% [2]CI	%[2]	95% [2]CI
All gambling	38.5	(37.1, 40.0)	26.7*	(24.9, 28.6)
All lottery	33.5	(32.1, 35.0)	21.6*	(20.0, 23.4)
Traditional	29.7	(28.3, 31.1)	18.3*	(16.7, 20.0)
Instant games	18.7	(17.5, 19.9)	11.3*	(10.1, 12.7)
Daily games	6.5	(5.8, 7.4)	5.5	(4.6, 6.5)
Raffles	5.9	(5.2, 6.7)	2.7*	(2.2, 3.4)
Casinos[1]	1.0	(0.8, 1.4)	1.0	(0.6, 1.5)
Sports betting	4.1	(3.5, 4.8)	4.6	(3.7, 5.7)
Private wagering	4.5	(3.8, 5.3)	2.3*	(1.7, 3.1)

	BGPS Monthly Participation		FGPS Monthly Participation	
	%[2]	95% [2]CI	%[2]	95% [2]CI
Horse racing	1.0	(0.7, 1.4)	NSF	
Bingo	1.2	(0.9, 1.6)	0.8	(0.5, 1.3)

[1] BGPS only had out-of-state casinos, FGPS had both in-state and out-of-state casinos

[2] Percentages and 95% CI are calculated using the weighted N

*Indicates significant change from Baseline

Reasons for Gambling

An important question in studies of gambling is why people choose to gamble. Respondents who gambled in the past year were asked to identify the main reason that they chose to gamble. Respondents could only select one answer to this question. Table 16 presents information about the main reported reason for gambling among past-year gamblers, monthly gamblers, and weekly gamblers in Massachusetts.

This table shows that past-year gamblers in Massachusetts were most likely to say that winning money was the main reason they gambled, followed by excitement and/or entertainment, to socialize with family or friends, and to support worthy causes. As gambling participation increased, excitement and/or entertainment became an increasingly important reason for gambling as did winning money. Also as gambling participation increased, socializing with family or friends and supporting worthy causes became less important reasons for gambling.

Table 16. Reasons for gambling among Massachusetts gamblers

	Past-year gamblers		Monthly gamblers		Weekly gamblers		
	%[2]	95% CI[2]	%[2]	95% CI[2]	%[2]	95% CI[2]	p-value[3]
Unweighted N[1]	2,055		797		642		
Reasons for gambling							
For excitement/entertainment	24.9	(21.9, 28.2)	33.2	(27.7, 39.3)	36.6	(30.6, 43.0)	<0.0001
To win money	30.3	(26.9, 33.9)	30.9	(25.7, 36.7)	43.3	(37.1, 49.8)	
To escape or distract yourself	1.5	(0.8, 3.0)	4.7	(2.3, 9.4)	2.7	(1.7, 4.4)	
To socialize with family or friends	18.3	(15.7, 21.4)	18.2	(14.0, 23.4)	11.7	(7.9, 17.1)	
To support worthy causes	10.0	(8.1, 12.1)	1.5	(0.9, 2.6)	1.4	(0.7, 2.7)	

[1] Unweighted N refers to the total number of respondents who were in this category for this question

[2] Percentages and 95% CI are calculated using the weighted N

[3] P-value from chi-square test for differences across groups

Hypothesis Testing: H5

Section 23 of the Sports Wagering Act required the MGC to develop an annual research agenda to understand the social and economic effects of sports betting in the Commonwealth. One issue that legislators in Massachusetts were particularly interested in was whether individuals participating in sports betting in Massachusetts **differ** from individuals participating in other types of gambling. In this section, we focus on differences in the demographics and gambling behavior of sports bettors in Massachusetts compared with individuals who gambled in the past year but not on sports.

The table below presents differences in the demographics of sports bettors in Massachusetts compared with individuals who gambled in the past year but not on sports. The table shows that sports bettors in Massachusetts were more likely than non-sports gamblers to be male, under the age of 35, White, have a Bachelor's degree or higher and to be employed. Overall, Massachusetts sports bettors were similar to sports

bettors in many other jurisdictions: more likely to be male, young, well-educated and employed or attending school fulltime (Armstrong & Carroll, 2017b; Russell, Hing, Li, & Vitartas, 2019; Winters & Derevensky, 2019).

Table 17. Comparing non-sports gamblers and sports bettors by demographics

		Non-sports gamblers			Sports bettors			
		Unweighted N[1]	%[2]	95% CI[2]	Unweighted N[1]	%[2]	95% CI[2]	p-value
Overall		2,985	83.3	(81.1, 85.3)	483	16.7	(14.7, 18.9)	
Gender								<0.0001
	Male	1,166	46.2	(43.3, 49.1)	311	68.5	(61.7, 74.5)	
	Female	1,773	53.4	(50.5, 56.3)	170	31.5	(25.5, 38.3)	
	Other	10		NSF	0	0.0	(,)	
Age								<0.0001
	1=18-20	25	1.9	(1.1, 3.4)	7		NSF	
	2=21-24	84	4.3	(3.1, 5.9)	16		NSF	
	3=25-34	352	14.9	(12.7, 17.3)	110	25.0	(19.3, 31.8)	
	4=35-54	913	30.0	(27.4, 32.7)	158	38.3	(31.3, 45.8)	
	5=55-64	542	23.7	(21.2, 26.5)	74	16.2	(12.0, 21.6)	
	6=65-79	666	19.8	(17.8, 22.0)	62	9.2	(6.4, 13.0)	
	7=80+	147	5.4	(4.2, 6.9)	16		NSF	
Ethnicity								<0.0001
	Hispanic	401	10.9	(9.3, 12.7)	40	6.4	(3.7, 11.0)	
	Black	332	7.4	(6.0, 9.1)	25		NSF	
	White	1,645	75.0	(72.6, 77.3)	307	85.8	(81.0, 89.5)	
	Asian	318	5.5	(4.6, 6.6)	59	5.3	(3.6, 7.7)	
	Other	27		NSF	3		NSF	
Education								0.0211
	Less than high school	84	5.1	(3.8, 7.0)	11		NSF	
	HS or GED	324	25.7	(22.7, 29.0)	37	18.7	(12.6, 26.8)	
	Some college	776	23.5	(21.3, 25.8)	103	18.6	(14.0, 24.4)	
	BA	788	28.1	(25.7, 30.6)	162	38.8	(32.3, 45.9)	
	MS or professional degree	706	14.9	(13.5, 16.6)	111	15.5	(11.9, 19.8)	
	PHD	143	2.6	(2.1, 3.3)	28	4.6	(2.7, 7.8)	
Employment								<0.0001
	1=employed	1,722	62.3	(59.5, 65.1)	327	75.2	(68.4, 80.9)	
	2=unemployed	106	4.5	(3.3, 6.2)	14		NSF	
	3=homemaker	57	2.1	(1.5, 3.0)	2		NSF	
	4=student	116	5.4	(4.0, 7.1)	16		NSF	
	5=retired	676	21.4	(19.3, 23.7)	75	11.7	(8.5, 15.9)	
	6=disabled	120	4.3	(3.2, 5.7)	13		NSF	
Income								<0.0001
	1=Less than $15,000	184	8.7	(6.9, 10.8)	21		NSF	
	2=$15,000-<$30,000	258	11.3	(9.3, 13.6)	25		NSF	
	3=$30,000-<$50,000	314	13.1	(10.9, 15.5)	43	10.8	(6.7, 16.9)	
	4=$50,000-<$100,000	697	28.3	(25.5, 31.3)	93	20.9	(15.3, 27.9)	
	5=$100,000-<$150,000	440	17.5	(15.4, 19.9)	87	21.6	(16.0, 28.6)	
	6=$150,000 and more	500	21.2	(18.8, 23.8)	139	38.0	(31.0, 45.5)	

[1] Unweighted N refers to the total number of respondents who answered this question

[2] Percentages and 95% CI are calculated using the weighted N

Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 18 presents the types of gambling that sports bettors in Massachusetts had done in the past year. Compared to participation rates for all Massachusetts adults (see Table 2), sports bettors were much heavier gamblers. For example, 62.3% of sports bettors compared to 43.3% of Massachusetts adults had purchased a lottery ticket in the past year. Over a quarter of sports bettors (27.8%) compared to 5.1% of Massachusetts adults had gambled at a Massachusetts casino in the past year; the difference was even greater for gambling at

an out-of-state casino (29.4% versus 4.3%). Past year rates of private wagering, horse race betting and bingo were all much higher among sports bettors compared with all Massachusetts adults. The rate of past year online gambling among sports bettors was six times higher than the rate of online gambling among all Massachusetts adults.

Table 18. Gambling behavior of sports bettors

	Unweighted N[1]	%	95% CI[2]	Ratio to MA[3]
Sporting events	483	100	(. , .)	
Traditional lottery	316	62.3	(55.4, 68.8)	1.44
Instant games	201	38.9	(32.3, 45.9)	1.46
Daily games	165	34.3	(27.8, 41.3)	2.37
Raffles	200	32.3	(26.8, 38.4)	1.74
Out-of-state casino	133	29.4	(23.5, 36.1)	6.84
Massachusetts casino	129	27.8	(21.6, 34.9)	5.45
Private wagering	146	30.9	(24.8, 37.8)	4.61
Horse racing	82	15.1	(11.0, 20.4)	5.81
Bingo	36	6.0	(3.5, 10.3)	2.86
Online	74	17.1	(12.1, 23.5)	6.33

[1] Unweighted N refers to the total number of respondents who answered this question

[2] Percentages and 95% CI are calculated using the weighted N

[3] Ratio calculated by dividing past-year participation of sports bettors by past-year participation of MA population

Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Overall, the hypothesis that sports bettors in Massachusetts **differ** from individuals participating in other types of gambling is **supported** with significant differences in the demographic characteristics of sports bettors compared to those who gambled but not on sports in the past year as well as much higher rates of participation in every type of gambling included in the survey.

Summary

In this section of the report, we have examined gambling behavior among Massachusetts adults in 2021 along with the demographic characteristics associated with participation in gambling overall and specific types of gambling. We have noted a decline in overall gambling participation among Massachusetts adults as well as declines in participation in specific types of gambling since 2013. Our hypothesis that past year lottery participation would be lower in 2021 was supported (with the exception of daily lottery games) but our hypothesis that past year casino gambling participation would be higher was not. In 2013, we speculated that the introduction of casinos in Massachusetts would lead to increases in monthly and weekly casino gambling which could contribute to larger numbers of at-risk and problem gamblers. Instead, there was a reduction in the rate of past year casino gambling among adults in Massachusetts between 2013 and 2021 and no changes in monthly or weekly participation. However, our analysis suggests that part of this overall decline was due to COVID-19 and the associated restrictions.

Turning to specific types of gambling, we identified changes in the demographic characteristics of casino gamblers between 2013 and 2021, with men and women in 2021 equally likely to have gambled at a casino in the past year and with no significant differences in past year casino gambling by age or race and ethnicity. There was still a significant difference in educational attainment among casino gamblers, with higher education

associated with a lower likelihood of gambling at a casino in the past year. We also identified changes in the demographic characteristics of sports bettors between 2013 and 2021. Although men, adults aged 25 to 54, Whites and individuals with higher household income were more likely to have bet on sports in the past year in both 2013 and 2021, there was no longer a difference in sports bettors in educational attainment compared to the adult Massachusetts population. We did identify significant demographic and behavioral differences between sports bettors in 2021 and the Massachusetts adult population.

In the next section of the report, we present detailed information about problem gambling in Massachusetts.

Problem Gambling in Massachusetts

One of the main negative social impacts of expanded gambling availability tends to be an increase in problem gambling (Williams, Rehm, & Stevens, 2011). The Baseline General Population Survey (BGPS) established the baseline prevalence of problem gambling in Massachusetts prior to the opening of any casinos and informed about the number of problem gamblers currently in Massachusetts (Volberg et al., 2017). The Follow-up General Population Survey (FGPS) provides up-to-date information about problem gambling in Massachusetts, including problem gambling prevalence rates among important demographic groups and among past-year participants in different gambling activities.

In this section of the report, we discuss how problem gambling was measured in the FGPS and then present information about the prevalence of problem gambling and the number of problem gamblers in Massachusetts. We then present information about the demographic distribution of at-risk and problem gambling as well as differences in problem gambling prevalence among people who have participated in specific types of gambling. In the next section of the report, we discuss differences between recreational, at-risk, and problem gamblers including demographics, game preferences, gambling expenditures, and comorbid conditions.

Appendix A: Definitions of Terms provides definitions of several of the terms used in this section of the report, including at-risk and problem gambling, as well as a discussion of the various terms used to describe problem gambling.

Measuring Problem Gambling in Massachusetts

As indicated previously, many instruments exist for the population assessment of problem gambling. Worldwide, the most commonly used instruments are the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987), the Problem Gambling Severity Index (PGSI) (Ferris & Wynne, 2001) and various scales based on the DSM diagnostic criteria for pathological gambling (e.g., Fisher, 2000; Gerstein, Volberg, Harwood, & Christiansen, 1999; Kessler et al., 2008; Petry, Stinson, & Grant, 2005). One or more of these instruments have been used in 95% of adult problem gambling prevalence surveys carried out internationally since 1975 (Williams, Volberg, & Stevens, 2012). Since 2000, the SOGS has largely been replaced by the PGSI and the DSM. In the DSM-5, the American Psychiatric Association (2013) redefined Disordered Gambling as a behavioral addiction and updated the diagnostic criteria; however, the new cutoffs and assessment of the severity levels established for the new criteria have not yet been translated into widely used assessment instruments (Molander & Wennberg, 2022). In 2013, we chose to use the newly developed Problem and Pathological Gambling Measure (PPGM) to assess gambling problems and harms in the baseline survey (BGPS) and it served as our primary instrument to assess problem gambling in the follow-up survey (FGPS) (Williams & Volberg, 2014).

The Problem and Pathological Gambling Measure (PPGM)

The PPGM is a 14-item assessment instrument with questions organized into three sections: Problems (7 questions), Impaired Control (4 questions), and Other Issues (3 questions). The instrument employs a 12-month timeframe and recognizes a continuum of gambling across four categories (Recreational, At-Risk, Problem, and Pathological). The PPGM has been field tested and refined with both clinical and general population samples.

The PPGM is different from other problem gambling instruments in several important respects. First, the PPGM comprehensively assesses *all* of the potential harms of problem gambling (i.e., financial, mental health, health,

relationship, work/school, legal), whereas only a subset of potential problems are assessed with the other instruments. Furthermore, to better capture problem gamblers who have not acknowledged they have a problem, the PPGM allows for either direct admission of a problem/harm or endorsement of something that indicates harm is occurring regardless of whether the person is willing to identify it as a problem. For example, one item in the PPGM asks if there is someone else besides the respondent who would say that their gambling has caused significant problems, even if the respondent does not agree.

Internationally, there is widespread agreement that for someone to be classified as a problem gambler there needs to be evidence of both (a) significant negative consequences, and (b) impaired control (Neal, Delfabbro, & O'Neil, 2005). This is made explicit in the PPGM which requires endorsement of one or more items from the Problems section and one or more items from the Impaired Control section to classify an individual as a **Problem Gambler**. In contrast, any pattern of item endorsement that results in a score above a certain threshold is sufficient to be designated as a problem gambler in the PGSI and DSM.[8] Endorsement of several PPGM problems and indices of impaired control is required to classify a person as a **Pathological Gambler**. Endorsement of a problem or impaired control, but not both, typically leads to classification as an **At-Risk Gambler**. This reflects the growing recognition that individuals who become problem gamblers can take a number of different pathways into the disorder (Blaszczynski & Nower, 2002; el-Guebaly et al., 2015b; Williams et al., 2015). Gamblers who do not meet the criteria for At-Risk, Problem, or Pathological Gambling are deemed to be **Recreational Gamblers**. Table 19 presents the PPGM typology and the criteria required for classification across these groups.

Table 19. Basis for classifying respondents using the PPGM

Category	Classification criteria
Non-Gambler	Has not gambled in the past 12 months
Recreational Gambler	Has gambled in past 12 months Total score 0
At-Risk Gambler	Total score 1+ Does not meet criteria for more severe categories OR Gambling frequency and expenditure ≥ PG median
Problem Gambler	Has gambled at least once a month in past 12 months Impaired Control score 1+ Problems score 1+ Total score of 2-4 OR Total score 3+ Gambling frequency and expenditure ≥ PG median
Pathological Gambler (equivalent to severe problem gambler)	Has gambled at least once a month in past 12 months Impaired Control score 1+ Problems score 1+ AND Total score of 5+

To minimize false positives (i.e., a positive test result that is incorrect), a person has to report gambling at least once a month in the past year to be classified as either a problem or pathological gambler. None of the older problem gambling instruments requires corroborating gambling behavior. To minimize false negatives (i.e., a

[8]The PGSI and DSM assessment instruments give each symptom equal weight despite the fact that some items are more serious and/or diagnostically important than others (McCready & Adlaf, 2006; Toce-Gerstein, Gerstein, & Volberg, 2003).

negative test result that is incorrect) and better identify problem gamblers who have not acknowledged they have a problem, a person can be classified as a problem gambler despite reporting sub-threshold levels of symptomatology if their gambling expenditure and frequency are equal to those of unambiguously identified problem gamblers. Although it is well recognized in the addiction field that a significant portion of people with addictions are in denial (Howard et al., 2002; Rinn, Desai, Rosenblatt, & Gastfriend, 2002; Shaffer & Simoneau, 2001), the PPGM is the only gambling instrument designed to identify these individuals.

In a comparative study of the performance of the three most frequently used problem gambling instruments (SOGS, PGSI, and NODS) and the PPGM, the PPGM demonstrated a high degree of overlap (i.e., concurrent validity) with the three other instruments as well as good association with gambling frequency and gambling expenditure (Williams & Volberg, 2014). Additional research has demonstrated that the PPGM produces consistent results across different jurisdictions and over periods of time with the same people (Back, Williams, & Lee, 2015; Williams et al., 2015). For readers interested in technical aspects of the PPGM, Appendix F1: Development and Performance of the PPGM presents a description of the development and performance of the instrument and a copy of the PPGM and scoring system is provided in Appendix F2: Problem and Pathological Gambling Measure (PPGM).

Problem Gambling Prevalence

In epidemiological research, prevalence is a measure of the number of individuals in the population with a disorder at one point in time. In epidemiology, prevalence differs from incidence, which is a measure of the number of new cases that arise over a specific period of time. Problem gambling prevalence refers to the percentage of individuals who meet the criteria for problem gambling within the past 12 months. In problem gambling prevalence surveys, individuals are classified on the basis of their responses to a valid and reliable problem gambling instrument such as the PPGM.

Prevalence rates are based on samples rather than the entire population. Even when a sample is representative of the population from which it is drawn, an identified value—such as the prevalence rate—is still an estimate and can be different, even if only slightly, from the 'true' value. One important source of uncertainty in generalizing from a sample to the population—sampling error—is generally presented as a measure of the uncertainty around the identified value. This measure is called the confidence interval and it is a gauge of how certain we are that the result we have identified is accurate. The conventional size of the confidence interval is 95% which means that if a researcher drew 100 samples from the same population, the identified value would fall between the lowest and highest values of the confidence interval 95 times.

Generally speaking, narrower confidence intervals are considered more reliable because the identified value will not be very different in other samples drawn from the same population. As sample size increases, confidence intervals typically narrow. Conversely, as sample size decreases, confidence intervals widen. Although the overall size of the sample for the FGPS is large, there are some groups in the sample that are quite small. In particular, because the prevalence of problem gambling tends to be low, we urge readers to treat estimates based on these small groups with caution and to pay particular attention to the confidence intervals surrounding these estimates.

Table 20 presents information about the distribution of the FGPS sample across the PPGM typology. The table shows that 51.3% of Massachusetts adults were recreational gamblers who gambled in the past year without any difficulties; 8.5% of Massachusetts adults were engaged in risky gambling behavior; and 1.4% of Massachusetts adults were classified as problem gamblers. We elected to collapse individuals classified as problem or pathological gamblers into one group, due to small sample sizes for these groups and the few statistically significant differences between the groups demographically or in

patterns of gambling participation. We refer to this combined group as 'problem gamblers' throughout the rest of the report.

Table 20. Classification of respondents on the PPGM

	Sample Size Unweighted N[1]	Percent[2]	95% CI[2]
Total	6,089	100	
Non-gambler	2,575	38.7	(36.7, 40.7)
Recreational gambler	2,953	51.3	(49.3, 53.4)
At-risk gambler	475	8.5	(7.4, 9.8)
Problem or pathological gambler	86	1.4	(1.0, 2.1)

[1] Unweighted N refers to the total number of respondents who were in this category for this question
[2] Percentages and 95% CI are calculated using the weighted N

Population Estimates

According to the most recent estimate, the population of Massachusetts adults (18+) in 2021 was 5,438,926 (2021 American Community Survey Public Use Microdata). Based on the point estimates and confidence intervals presented in Table 21Table 20, we estimate that between 54,389 (1.0%) and 114,217 (2.1%) Massachusetts adults were problem gamblers in 2021. An additional 402,481 (7.4%) and 533,015 (9.8%) Massachusetts adults were at-risk gamblers. If we consider that each problem gambler is responsible for social and economic impacts that ripple out to their families, friends, employers, and communities, the proportion of the Massachusetts population affected by gambling-related problems is even higher.

Hypothesis Testing: H4

In considering how problem gambling prevalence might have changed between 2013 and 2021, we hypothesized that prevalence would be **higher** in the FGPS compared with the BGPS, reflecting the increase in gambling availability in Massachusetts. This hypothesis is **not supported** because, as shown in Table 21, the prevalence of problem gambling has not changed significantly between the two surveys. Instead, there has been an increase in the proportion of non-gamblers in the Massachusetts adult population, a decrease in the proportion of recreational gamblers, and no change in the prevalence of at-risk and problem gambling. Effect sizes for all of these changes are small (-0.23 to 0.26).

Table 21. Changes in problem gambling prevalence from baseline

	BGPS		FGPS	
	Percent[1]	95% CI[1]	Percent[1]	95% CI[1]
Total	100		100	
Non-gambler	26.6	(25.3, 28.0)	38.7*	(36.7, 40.7)
Recreational gambler	62.9	(61.4, 64.4)	51.3*	(49.3, 53.4)
At-risk gambler	8.4	(7.5, 9.4)	8.5	(7.4, 9.8)
Problem or pathological gambler	2.0	(1.6, 2.6)	1.4	(1.0, 2.1)

*Indicates significant change from Baseline
[1] Percentages and 95% CI are calculated using the weighted N

Prevalence by Type of Gambling

Another way to understand the relationship between gambling involvement and gambling-related problems is to examine the prevalence of problem gambling among individuals who participate in specific types of gambling.

Table 22 shows the prevalence of at-risk and problem gambling among respondents who participated in the past year in specific types of gambling. For example, the prevalence of problem gambling was 1.4% in the adult population and 2.3% among past-year gamblers but 5.0% among past-year casino bettors, 3.8% among past-year instant lottery ticket purchasers and 4.0% among past-year players of the Lottery's daily games.

Table 22. Differences in PG prevalence by type of gambling

	Unweighted N[1]	At-risk gambling %[2]	At-risk gambling 95% CI[2]	Problem gambling %[2]	Problem gambling 95% CI[2]
Total Sample/ Population	6,089	8.5	(7.4, 9.8)	1.4	(1.0, 2.1)
All Gambling	3,494	13.7	(11.9, 15.6)	2.3	(1.6, 3.4)
All lottery	2,811	15.0	(13.0, 17.3)	2.9	(2.0, 4.2)
Traditional	2,604	15.5	(13.4, 18.0)	2.7	(1.8, 4.1)
Instant games	1,547	19.8	(16.7, 23.4)	3.8	(2.5, 5.7)
Daily games	799	25.2	(20.6, 30.4)	4.0	(2.5, 6.2)
Raffles	1,108	14.5	(11.6, 17.9)	2.5	(1.5, 4.3)
Only Casinos-out of state	226	25.9	(18.0, 35.6)		NSF
Only Casinos-MA	311	11.9	(8.0, 17.3)		NSF
Casinos both in and out of state	305	35.8	(27.5, 45.0)		NSF
Casinos in or out of state	872	25.8	(21.3, 30.9)	5.0	(3.0, 8.3)
Sports betting	483	27.1	(21.2, 33.8)	1.6	(0.9, 2.8)
Private wagering	360	23.1	(17.5, 29.8)	2.5	(1.5, 4.0)
Horse racing	125	32.3	(20.7, 46.4)		NSF
Bingo	112	27.2	(16.4, 41.5)		NSF
Online	139	44.7	(31.9, 58.3)		NSF

[1] Unweighted N refers to the total number of respondents who answered this question

[2] Percentages and 95% CI are calculated using the weighted N

Note: Not Sufficient information (NSF) indicates estimates are unreliable, relative standard error > 30%

When compared to prevalence rates of at-risk and problem gambling for specific types of gambling in 2013, there were few significant changes. The only significant change was a lower rate of problem gambling among past-year sports bettors in 2021 compared with the rate of problem gambling among past-year sports bettors in 2013 (see Table 76 in Appendix F). This is likely due to the legalization of sports betting in Massachusetts leading to an influx of participants (primarily recreational gamblers) who were previously deterred by its illegality.

Comparing Massachusetts to Other States

A final consideration concerns how the 1.4% problem gambling prevalence rate in Massachusetts in 2021 compares to other states. Table 23 shows key details of the 13 problem gambling surveys that have been conducted in other U.S. states since 2015. A study by Williams, Volberg, and Stevens (2012) identified the main methodological differences across the 202 prevalence surveys conducted internationally through 2011 and developed weights that could be applied to obtain 'standardized' prevalence rates for nearly all existing problem gambling prevalence studies.

Table 23. Recent U.S. adult problem gambling prevalence studies

Year	State	Administration Modality	Response Rate	Sample Size	Past Year Gambling Prevalence	Problem Gambling (PG) Instrument	PG Rate	Survey Description	Standardized Problem Gambling Rate
2015	New Jersey	Telephone interview (cell + landline)	5.3%	1,500	69.8%	PGSI 8+[1]	0.6%	health and recreation	0.6 * 2.17 * 2.18 * 1.0 = **2.8%**
2017	Maryland	Telephone interview (cell + landline)	6.6%	3,761	87.0%	NODS 3+	1.9%	views on gambling	1.9 * 1.19 * 2.18 * 0.51 = **2.5%**
2017	Kansas	ABS: self-administered paper or online	Not reported	1,755	48.0% (monthly)	Mix of 8 PGSI & NODS items	2.7% high risk	Kansas gambling survey	Cannot be calculated
2018	Iowa	Telephone interview (cell + landline)	26.3%	1,761	73.8%	PGSI 8+	0.8%	public attitudes and behaviors toward gambling	0.8 * 2.17 * 2.18 * 0.51 = **1.9%**
2019	Minnesota	ABS: self-administered paper or online	25.0%	8,512	67.0%	PPGM	1.3%	recreation and well-being	1.3 * 1.0 * 1.0 * 1.0 = **1.3%**
2020	New York	ABS: self-administered paper or online	27.9%	3,845	29.4%	PPGM	0.7%	health and recreation	0.7 * 1.0 * 1.0 * 1.0 = **0.7%**
2021	Illinois	ABS: self-administered online (85.7%); phone interview (14.3%)	4.1%	2,029	68.4%	PPGM	3.8%	Illinois survey of gambling	3.8 * 1.0 * 1.1 * 0.51 = **2.1%**
2021	Washington State	ABS: self-administered paper or online	19.2%	9,413	43.5%	PGSI 5+	1.5%	health and recreation	1.5 * 1.0 * 1.0 * 1.0 = **1.5%**
2021/ 2022	Massachusetts	ABS: self-administered paper or online (98.3%); phone interview (1.7%)	27.5%	6,293	60.2%	PPGM	1.4%	health and recreation	1.4 * 1.0 * 1.0 * 1.0 = **1.4%**
2022	Indiana	ABS: self-administered paper or online	19.6%	855	89.3%	NODS 5+ PGSI 8+ DSM-5 4+[3]	1.6% 1.3% 2.3%	Unclear: "invitation letter provided a description of the study"	1.6 * 2.60 * 1.0 * 0.51 = **2.1%** 1.3 * 2.17 * 1.0 * 0.51 = **1.4%**
2022	Oklahoma	Unspecified mix of multimodal ABS + online panel + social media recruitment	NA because of inclusion of convenience samples	4,035	57.9%	DSM-5 4+ (derived from PPGM questions)	6.3%	"recreation and leisure activities, including betting and gambling"	Cannot be calculated
2022	Missouri			3,259	63.9%		4.1%		
2023	Connecticut[2]	ABS: self-administered online	11.8%	5,259	69.2%	NODS 3+ PPGM	1.4% 1.8%	health and recreation	1.4 * 1.19 * 1.0 * 1.0 = **1.7%** 1.8 * 1.0 * 1.0 * 0.51 = **1.8%**

[1] The PGSI is the Problem Gambling Severity Index (Ferris & Wynne, 2001)

[2] This report is forthcoming and will be available on the CT DMHAS website in late 2023

[3] Conversion factors have not been developed for the DSM-5 criteria

Using these standardized rates, it is possible to compare the problem gambling prevalence rate obtained in Massachusetts in 2021 with rates from many other jurisdictions.[9] As the table shows, the 1.4% Massachusetts rate is mid-range between the 2.8% New Jersey rate and the 0.7% New York rate (the New York rate is anomalously low because the survey was conducted in the midst of the COVID-19 pandemic: July 2020 – December 2020). (Note that the anomalously high unstandardized Oklahoma and Missouri problem gambling prevalence rates are likely attributable to the inclusion of online panelists and people recruited via social media within the sample, as well as identifying the survey as a 'gambling study.')

Summary

In this section of the report, we have provided an overview of how problem gambling was measured in the survey as well as information about the prevalence of problem gambling and the number of problem gamblers in Massachusetts after all three casinos had opened. We have examined problem gambling prevalence among Massachusetts adults in 2021 with a focus on the overall prevalence of problem gambling among past-year participants in specific types of gambling. We found that the prevalence of at-risk and problem gambling did not change significantly between 2013 and 2021; instead, there was a notable decrease in gambling participation in this period (possibly due to the lingering impacts of the COVID-19 pandemic but also likely reflecting the much longer North American trend of declining gambling participation rates as well as problem gambling prevalence rates) but no change in the prevalence of at-risk or problem gambling. A key finding is that approximately 78,000 Massachusetts adults (between 54,389 and 114,217) were classified as problem gamblers in 2021. An additional 460,000 Massachusetts adults (between 402,481 and 533,015) were classified as at-risk gamblers.

In the next section of the report, we focus on differences between individuals who gamble, with and without problems, in order to identify subgroups in the population that are at greatest risk of experiencing gambling-related harms.

[9] Weights were developed to adjust for the higher prevalence rates that are obtained when describing the survey as a 'gambling' survey, the lower prevalence rates that are obtained when conducting a telephone interview rather than having the survey self-administered, and the different prevalence rates that are obtained using different assessment instruments (i.e., PGSI, SOGS, DSM).

Comparing Recreational, At-Risk, and Problem Gamblers

In considering how best to develop and refine policies and programs for those experiencing gambling problems, it is important to direct these efforts in an effective and efficient way. The most effective efforts at prevention, outreach, and treatment are targeted at individuals who are at greatest risk of experiencing gambling-related difficulties. Because the purpose of this chapter is to examine vulnerable individuals, our focus here is on differences between individuals who gamble, with and without problems, rather than on the entire sample of Massachusetts adults.

As shown above, recreational and at-risk gamblers far outnumber individuals in the population who experience gambling problems. Given the much greater size of the recreational and at-risk groups, some may argue that these individuals need not be examined as closely as individuals who are classified as problem gamblers. However, there is empirical evidence that some recreational and at-risk gamblers, on occasion, experience a loss of control over their gambling involvement or harm related to their gambling without developing more serious problems. There is also evidence that impaired control and subsequent problem development are a common and predictable consequence of regular, high-intensity gambling rather than something confined to a small minority of constitutionally predisposed or mentally disordered gamblers (MAGIC Research Team, 2021).

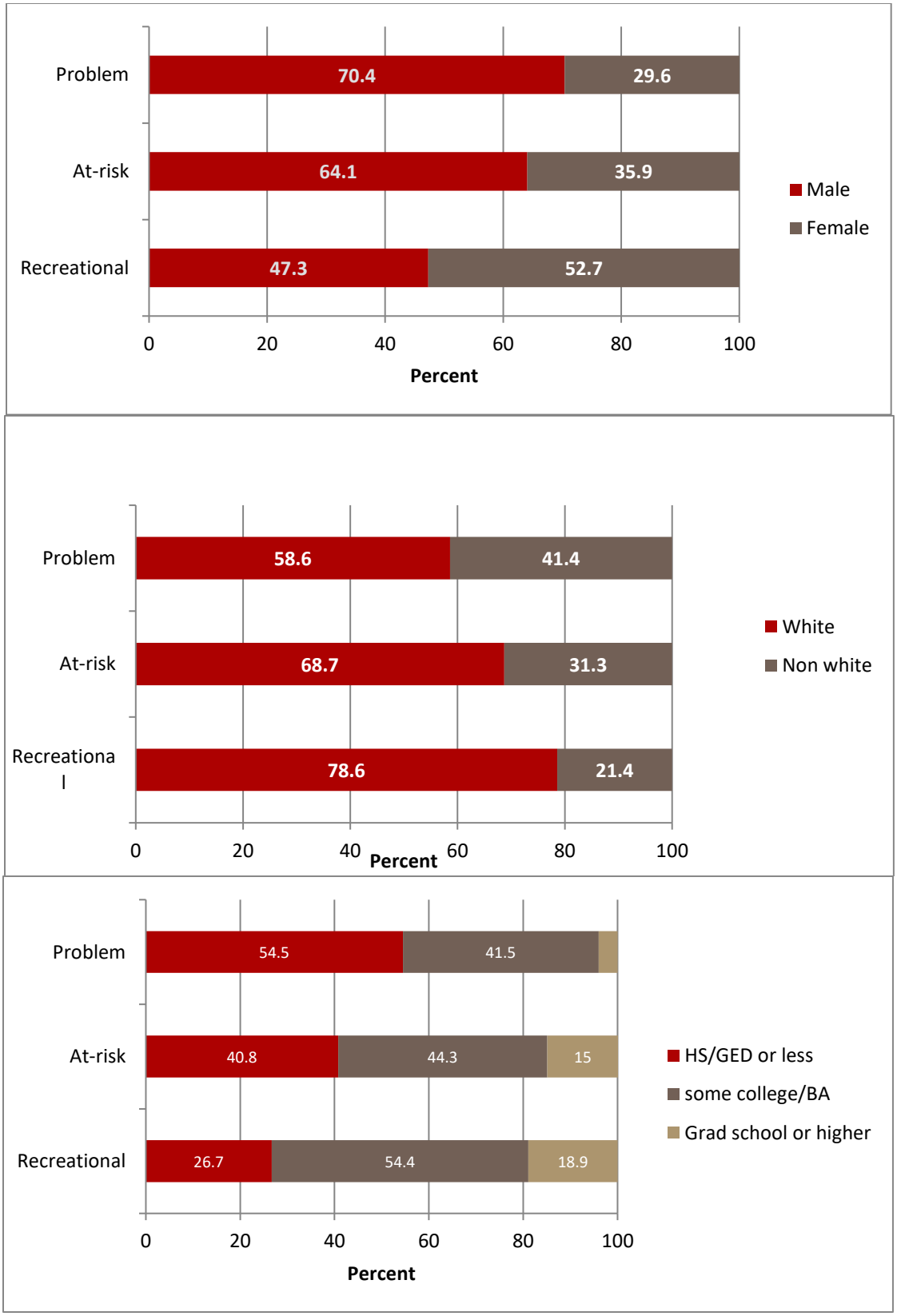
For precisely these reasons—the size of the recreational and at-risk groups and the common experience of loss of control and harms—we believe that particular attention should be paid to these groups. This is important both to better understand characteristics common among the majority of people who gamble without developing problems and to understand characteristics common among individuals experiencing gambling harms. Identifying common characteristics among these groups is a critical first step in understanding the factors that might place a person at greater risk of, or protect a person from developing, a gambling problem.

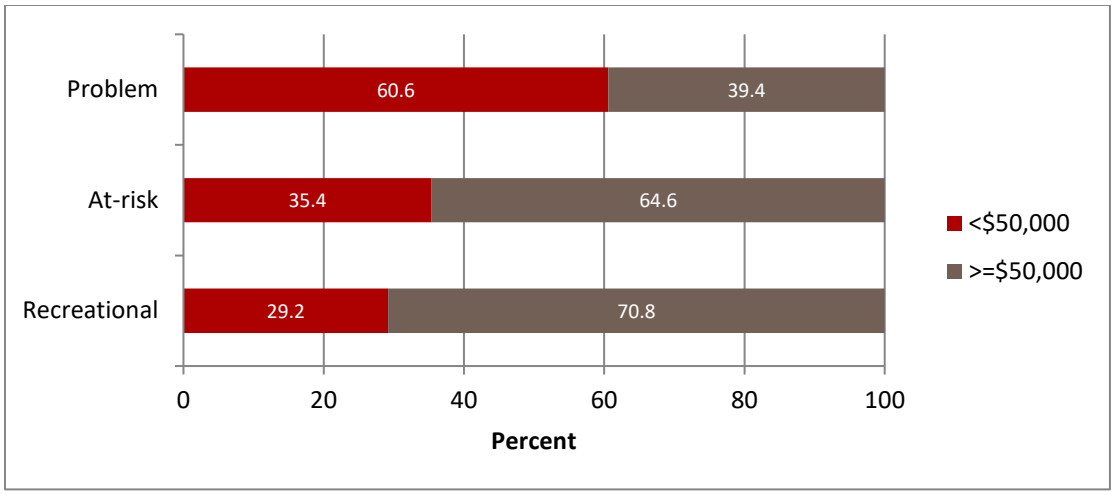
As noted in the previous section, the PPGM serves as the primary measure of recreational, at-risk, and problem gambling in Massachusetts. In this section, we examine differences between groups of respondents who score at increasing levels of severity on the PPGM in terms of demographics, gambling participation, and other important correlates of problem gambling. We have elected to collapse individuals classified as problem or pathological gamblers into one group, due to small sample sizes for these groups and the few statistically significant differences between the groups demographically or in patterns of gambling participation. We refer to this combined group as ‘problem gamblers’ throughout the rest of this section.

Demographics

Figure 6 on the following page shows that, as in many other jurisdictions, those experiencing gambling harms in Massachusetts were demographically distinct from recreational gamblers. Individuals experiencing gambling harms in Massachusetts were significantly more likely than recreational gamblers to be male and non-White, and to have a high school diploma or less. Individuals experiencing gambling problems in Massachusetts were significantly more likely than recreational gamblers to have an annual household income less than $50,000 (see also Table 77 in Appendix G).

Figure 6. Demographics of recreational, at-risk, and problem gamblers





Note: Some data are not shown due to unreliable estimates or cell size less than or equal to 5
Note: This information is presented in detail in Table 77 in Appendix G

Gambling Participation

Information about the demographic characteristics of recreational, at-risk, and problem gamblers is useful in designing prevention and treatment services and also helpful to understand differences in the gambling behavior of these groups. Information about the behavioral correlates of problem gambling can help professionals design appropriate prevention and treatment measures, effectively identify vulnerable individuals, and establish accessible services.

Past-Year Gambling

At-risk and problem gamblers participated in significantly more gambling activities than recreational gamblers in the past year. The average number of past-year gambling activities among recreational gamblers was 2.1 compared with 3.4 among at-risk gamblers ($p<0.0001$) and 3.4 among problem gamblers ($p<0.0001$).

Table 24 compares past-year gambling participation among recreational, at-risk, and problem gamblers. The table shows that at-risk gamblers were significantly more likely than recreational gamblers to have played traditional, instant and daily lottery games, gambled on casino table games and EGMs, bet on sports, wagered privately, bet on horse races and bingo and gambled online. Problem gamblers were significantly more likely than recreational gamblers to have played instant and daily lottery games and gambled on casino table games and EGMs. Past year participation rates among problem gamblers were unreliable for several types of gambling including sports betting, horse racing, bingo and online and are therefore not reported. Problem gamblers and recreational gamblers were equally likely to have wagered privately whereas at-risk gamblers were significantly more likely than recreational gamblers to have wagered privately.

Table 24. Past-year gambling participation by gambling group

	Recreational gamblers		At-risk gamblers		Problem gamblers		
	%[2]	95% CI[2]	%[2]	95% CI[2]	%[2]	95% CI[2]	p-value[3]
Unweighted N[1]	2,953		475		86		
All lottery	78.3	(75.8, 80.5)	86.1	(80.9, 90.0)	98.6	(94.2, 99.7)	<0.0001
Traditional	71.1	(68.4, 73.6)	81.2	(75.4, 85.9)	86.0	(66.2, 95.0)	0.0010
Instant games	40.9	(38.1, 43.7)	63.4	(56.6, 69.8)	73.3	(52.7, 87.1)	<0.0001
Daily games	20.6	(18.3, 23.1)	44.0	(37.0, 51.3)	41.7	(25.9, 59.4)	<0.0001

	Recreational gamblers		At-risk gamblers		Problem gamblers		
	%[2]	95% CI[2]	%[2]	95% CI[2]	%[2]	95% CI[2]	p-value[3]
Raffles	31.0	(28.5, 33.7)	32.6	(26.5, 39.4)	34.0	(19.9, 51.7)	0.8589
Table games	6.5	(5.1, 8.2)	18.0	(13.4, 23.7)	16.3	(8.9, 27.9)	<0.0001
EGMs	9.8	(8.3, 11.5)	23.9	(18.7, 29.9)	32.4	(17.2, 52.7)	<0.0001
Sports betting	14.2	(12.2, 16.5)	32.3	(25.7, 39.7)		NSF	<0.0001
Private wagering	10.1	(8.3, 12.1)	18.6	(14.1, 24.2)	11.9	(6.7, 20.2)	0.0068
Horse racing	3.1	(2.2, 4.3)	9.9	(6.1, 15.8)		NSF	0.0054
Bingo	2.7	(1.8, 3.9)	6.9	(4.0, 11.4)		NSF	0.0129
Online	2.7	(1.9, 3.9)	14.4	(9.6, 21.0)		NSF	0.0001

[1] Unweighted N refers to the total number of respondents who were in this category for this question
[2] Percentages and 95% CI are calculated using the weighted N
[3] P-value from chi-square test for differences across groups
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Monthly Gambling

Table 25 presents monthly or more frequent gambling participation rates among recreational, at-risk, and problem gamblers. Because monthly gambling was one of the criteria for classifying individuals as problem gamblers, all of the problem gamblers gambled monthly or more often.

Table 25. Monthly gambling participation by gambling group

	Recreational gamblers		At-risk gamblers		Problem gamblers		
	%[2]	95% CI[2]	%[2]	95% CI[2]	%[2]	95% CI[2]	p-value[3]
Unweighted N[1]	2,953		475		86		
All lottery	29.0	(26.4, 31.8)	69.7	(62.9, 75.8)	96.7	(91.9, 98.7)	<0.0001
Traditional	24.3	(21.9, 26.9)	62.0	(55.0, 68.5)	79.5	(61.5, 90.4)	<0.0001
Instant games	13.1	(11.3, 15.1)	46.9	(39.8, 54.1)	68.1	(48.5, 82.9)	<0.0001
Daily games	6.1	(4.8, 7.7)	25.5	(19.5, 32.6)	25.8	(15.6, 39.7)	<0.0001
Raffles	2.9	(2.2, 3.9)	11.7	(7.6, 17.6)		NSF	0.0002
Table games		NSF	4.1	(2.4, 7.1)		NSF	<0.0001
EGMs	1.5	(1.0, 2.3)	6.7	(4.2, 10.4)		NSF	0.0006
Sports betting	5.0	(3.7, 6.6)	24.1	(18.0, 31.5)		NSF	<0.0001
Private wagering	3.2	(2.2, 4.8)	7.0	(4.4, 11.0)		NSF	0.0168
Horse racing		NSF		NSF		NSF	0.0092
Bingo		NSF		NSF		NSF	0.0043

[1] Unweighted N refers to the total number of respondents who were in this category for this question
[2] Percentages and 95% CI are calculated using the weighted N
[3] P-value from chi-square test for differences across groups
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

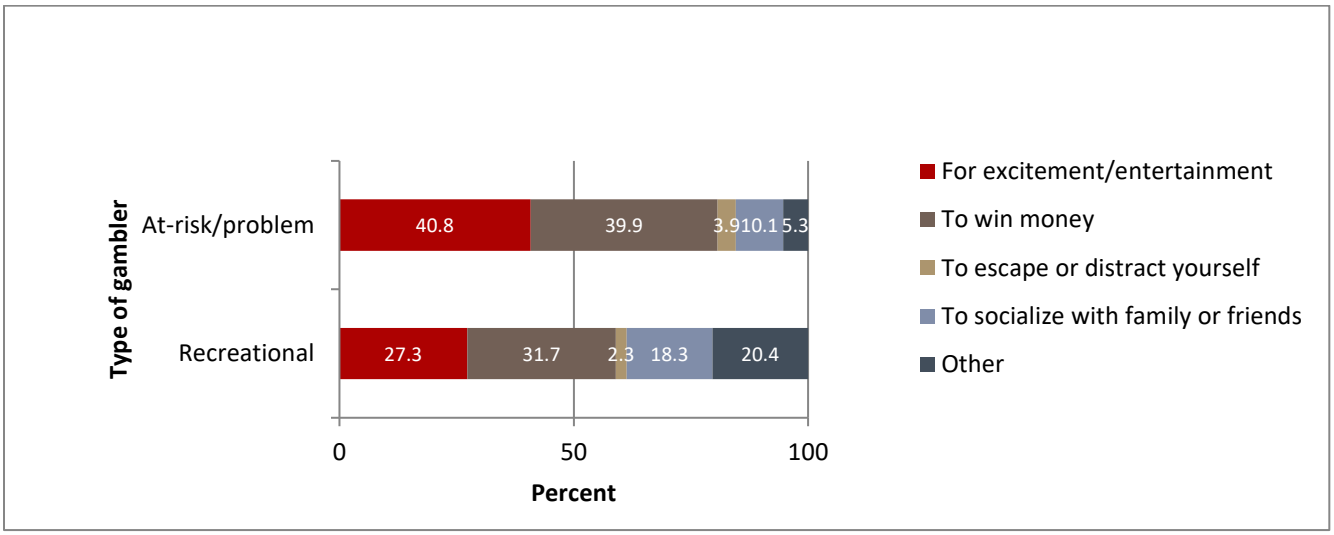
The table shows that 29.0% of recreational gamblers purchased lottery products once a month or more often compared with 69.7% of at-risk gamblers and 96.7% of problem gamblers. The difference in monthly participation was highest for traditional lottery games, which 24.3% of recreational gamblers played monthly or more often compared with 62.0% of at-risk gamblers and 79.5% of problem gamblers. In contrast to past-year participation in raffles, at-risk gamblers were significantly more likely than recreational gamblers to purchase raffles once a month or more often. At-risk gamblers were also significantly more likely than recreational

gamblers to bet on sports monthly or more often. The small size of the problem gambling group meant that monthly participation rates for most types of gambling were unreliable and are therefore not reported.

Reasons for Gambling

Recreational, at-risk and problem gamblers tend to gamble for different reasons. Figure 7 shows that 'winning money' was the most important reason for gambling among recreational gamblers followed by 'excitement and/or entertainment.' Among at-risk and problem gamblers, 'winning money' and 'excitement and/or entertainment' were equally important reasons for gambling. Gambling to socialize with friends and family was a much more common reason for gambling among recreational gamblers compared with at-risk and problem gamblers.

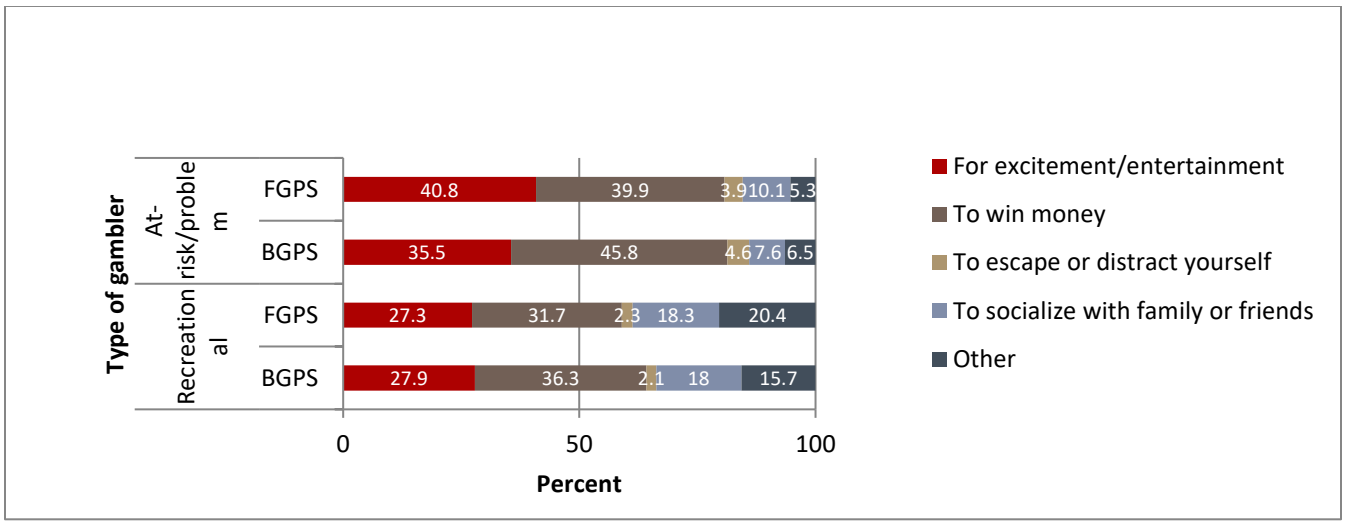
Figure 7. Reasons for gambling by gambling group



Note: Some data are not shown due to unreliable estimates or cell size less than or equal to 5
Note: This information is presented in detail in Table 78 in Appendix G

Figure 8 provides a comparison of reasons for gambling among recreational, at-risk and problem gamblers from the baseline survey (BGPS) and the follow-up survey (FGPS). Overall, the main reasons for gambling changed very little among any of the gambling groups between 2013 and 2021. Effect sizes for all of the differences were small (-0.10 to 0.12).

Figure 8. Comparing reasons for gambling by gambling group in BGPS and FGPS



Gambling Expenditures by Gambler Group

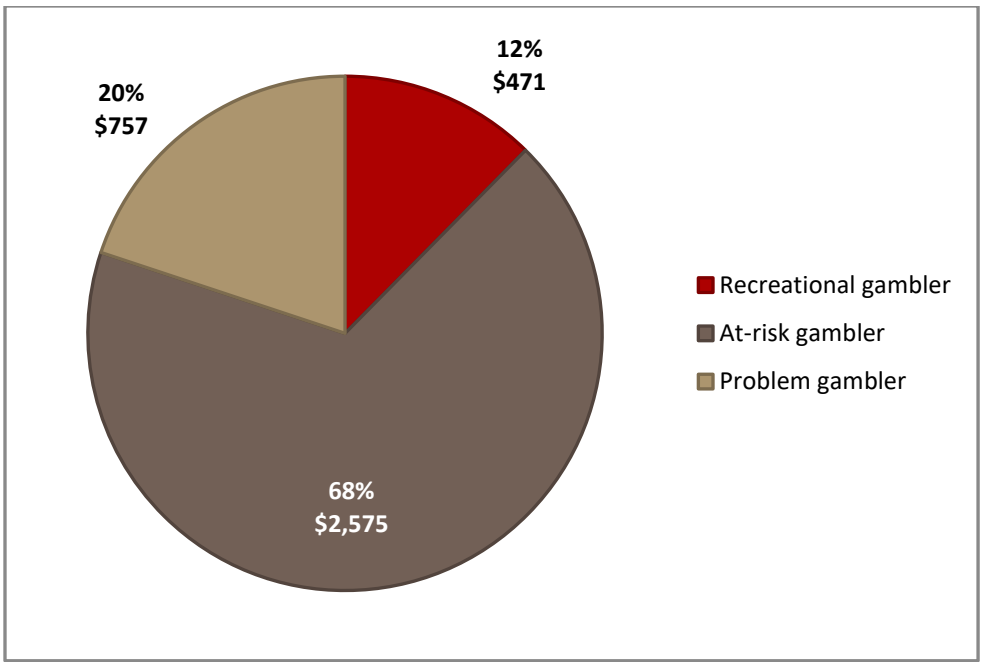
Beyond participation, spending on different gambling activities is another important measure of gambling participation as these numbers can shed light on the proportion of gambling revenue derived from recreational, at-risk, and problem gamblers. This issue is important to researchers and the general public alike, many of whom argue that the legitimacy of gambling and its continued expansion depends in part on the extent to which gambling revenues are derived from vulnerable individuals (Eadington, 2009; Orford, Wardle, & Griffiths, 2013; Rose, 1986; Williams & Wood, 2004). However, as mentioned previously, accurate expenditure data can be difficult to obtain. Despite these limitations, self-reported expenditure data provide a valuable lens into the **relative** proportion of gambling expenditures by recreational, at-risk, and problem gamblers. In this section, we briefly review the methods used to analyze expenditure data in the FGPS and discuss the relative proportion of expenditures by each group of past-year gamblers. A fuller discussion of expenditure data is provided in Appendix E1: Gambling expenditure data.

Assessing the Relative Proportion of Expenditures Reported by Each Gambler Group

As noted previously, we elected to eliminate extreme and improbable outliers in these data. We first examined the average amount of money that each group of past-year gamblers reported spending on all forms of gambling. We found that those experiencing gambling problems in Massachusetts reported spending an average of approximately $1,103 monthly on gambling compared to approximately $1,052 spent monthly by at-risk gamblers and $48 by recreational gamblers. For additional information about gambling expenditures, see Table 79 in Appendix G.

We looked first at the proportion of expenditures that each group spent annually on gambling. Because self-reported expenditure data rarely matches gross gaming revenues reported to governments, we looked at total spending by each gambling group to determine the proportion of the total accounted for by each group. Overall, recreational gamblers spent a total of $471 million, at-risk gamblers spent a total of $2,575 million, and problem gamblers spent a total of $757 million. Figure 9 shows that recreational gamblers accounted for 12% of total expenditure, at-risk gamblers accounted for 68% of total expenditure, and problem gamblers accounted for 20% of total expenditure.

Figure 9. Total expenditures (in Millions) on all gambling by gambling group



Note: These data were truncated by 4 standard deviations from the mean to account for extreme outliers; weighted values were used to calculate overall expenditure
Note: This information is presented in detail in Table 79 in Appendix G

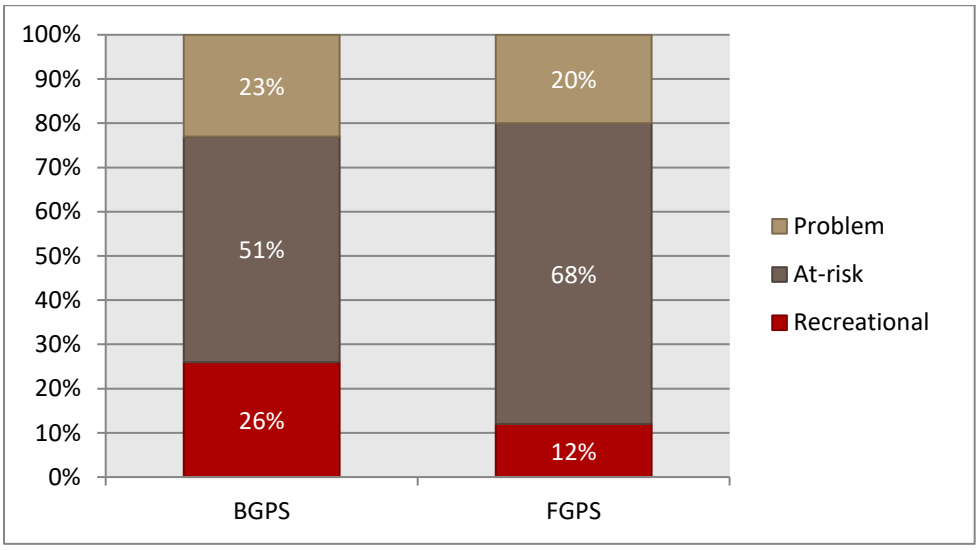
In total, at-risk and problem gamblers spent much more on gambling annually than recreational gamblers. It is interesting to compare the proportion of expenditures shown in the figure above with the proportion of each gambler group in our sample. For example, although recreational gamblers constituted 51.3% of our sample, they accounted for only 12% of reported expenditures. This disparity is even more noticeable for at-risk and problem gamblers; although at-risk gamblers constituted only 8.5% of our sample, they accounted for 68% of reported expenditures, and although problem gamblers constituted only 1.4% of our sample, they accounted for 20% of reported expenditures.

These findings may have most relevance for developing strategies to prevent at-risk gamblers from developing gambling problems over time. This group accounted for the largest proportion of reported gambling expenditures which indicates a need to create responsible gambling campaigns and programs that target at-risk gamblers. Similarly, because problem gamblers accounted for a large share of self-reported expenditures relative to the size of this group in the sample, there may be a need to develop specialized treatment strategies that address the issue of gambling expenditures.

In our baseline survey (BGPS) report, we argued that the proportion of gambling expenditures accounted for by different gambling groups should be monitored to see if and how they changed in the wake of expanded gambling. As Figure 10 shows, we reported in 2013 that recreational gamblers accounted for 26% of self-reported expenditures, at-risk gamblers accounted for 51% of self-reported expenditures and problem gamblers accounted for 23% of self-reported expenditures on gambling. In 2021, recreational gamblers accounted for a much smaller proportion of self-reported expenditures and at-risk gamblers accounted for a much larger proportion of self-reported expenditures compared with 2013. Both the results from 2013 and 2021 conform to the Pareto principle, in which roughly 80% of outcomes (in occupational health and safety, engineering, quality control, and health) are accounted for by 20% (or less) of the individuals involved. The Pareto principle has been

found to apply to gambling expenditures across multiple studies (e.g., Fiedler, Kairouz, Costes, & Weißmüller, 2019; Kesaite, Wardle, & Rossow, 2023; Tom, LaPlante, & Shaffer, 2014; Volberg et al., 2001; Williams & Wood, 2007).

Figure 10. Comparing proportion of total expenditures by gambling group in BGPS and FGPS



Other Correlates of Problem Gambling

In this section, we present information about the physical and mental health correlates of problem gambling, including use of tobacco, alcohol, and illicit drugs. We begin by examining the difference between recreational, at-risk and problem gamblers regarding the number of people in their social networks who gamble regularly. This is important because a key finding from the 2013 survey was that the gambling involvement of family and friends is strongly correlated with recreational, at-risk and problem gambling (Alissa Mazar, Williams, Stanek, Zorn, & Volberg, 2018). In the 2021 survey, 1.6% of recreational gamblers indicated that most or all of their friends and family members gambled regularly. In contrast, 7.9% of at-risk gamblers and 38.8% of problem gamblers indicated that most or all of their close friends and family members gambled regularly ($p<0.0001$) (see Table 80 in Appendix G).

Physical and Mental Health

Table 26 presents differences between recreational, at-risk, and problem gamblers on several health-related dimensions. The table shows that problem gamblers in Massachusetts were significantly more likely than recreational gamblers to identify their physical health status as poor or fair as opposed to good or excellent. In contrast to 2013, at-risk and problem gamblers in 2021 were not significantly more likely than recreational gamblers to say they had experienced serious problems with depression, anxiety, or other mental health problems in the past 30 days or in the past year. Given that overall general health in the United States has declined since the 1980s and rates of depression have risen dramatically since 2013, it is quite possible that some of the changes observed in general health and depression between 2013 and 2021 in Massachusetts are due to these longer term trends (Blue Cross Blue Shield Association, 2018; Muennig, Reynolds, Fink, Zafari, & Geronimus, 2018).

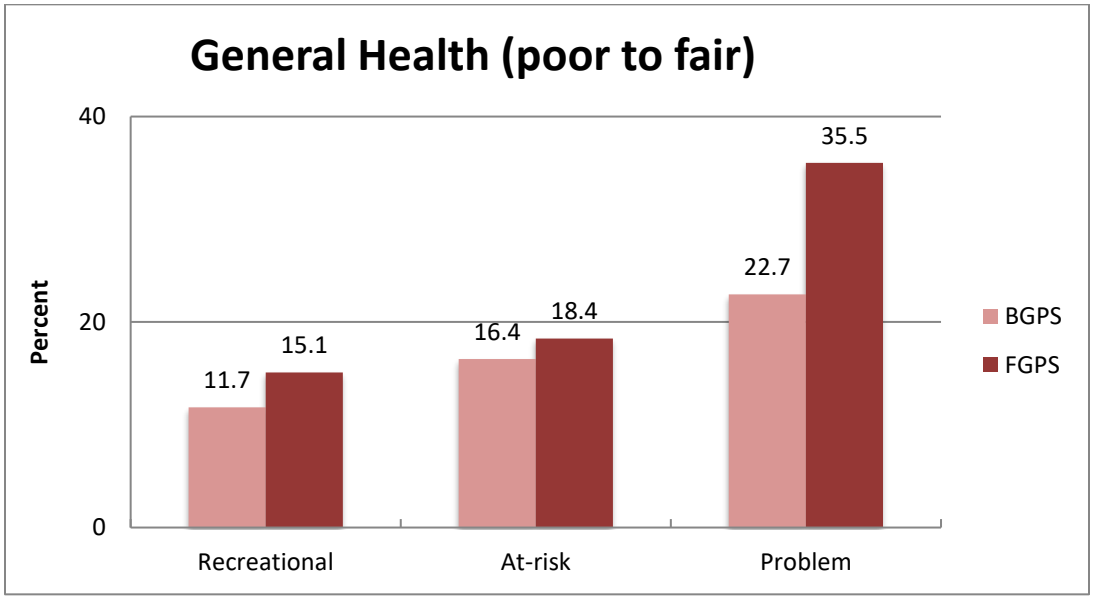
Table 26. Differences in physical and mental health by gambling group

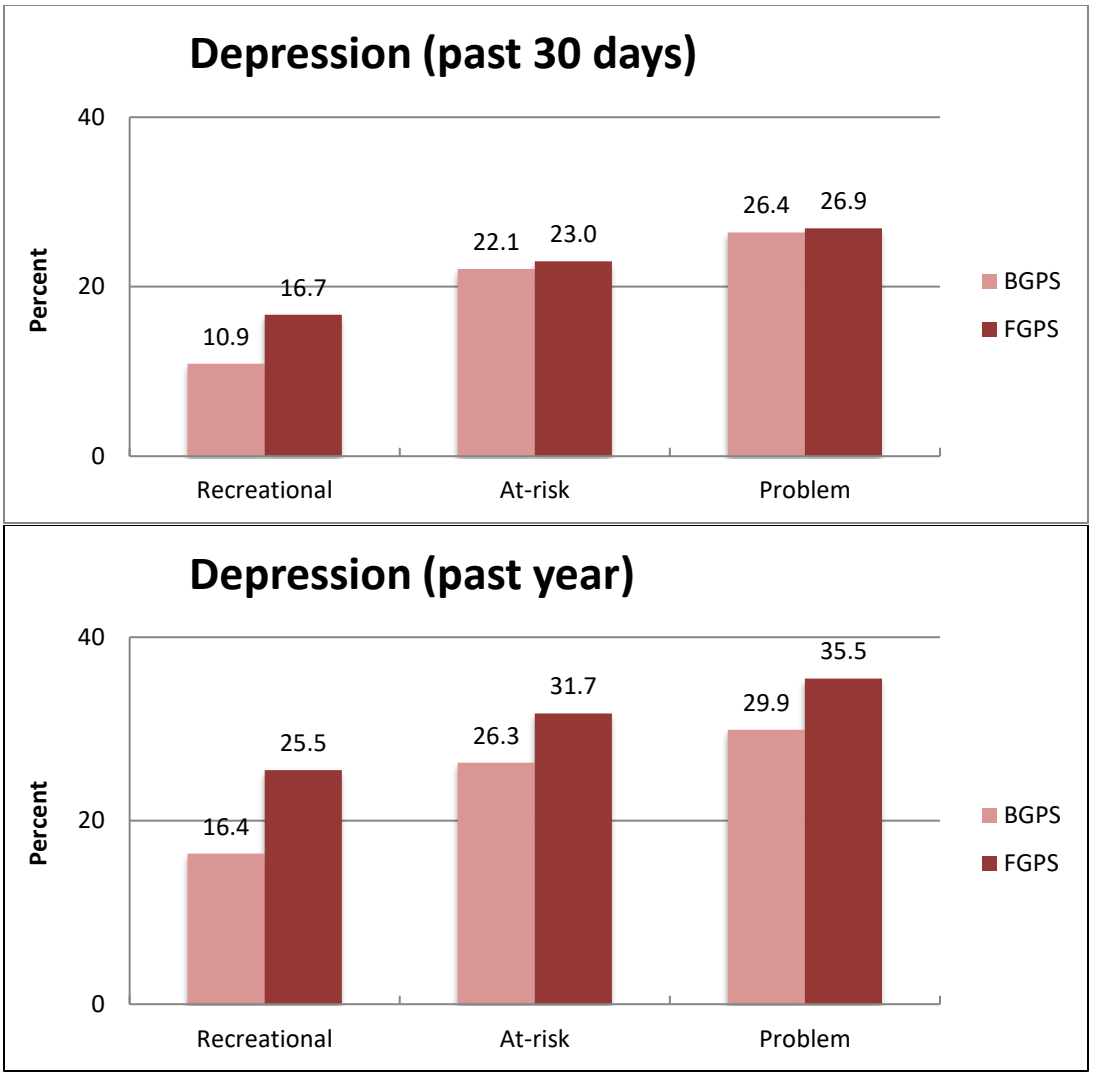
	Recreational gambler		At-risk gambler		Problem gambler		
	%[2]	95% CI[2]	%[2]	95% CI[2]	%[2]	95% CI[2]	p-value[3]
Unweighted N[1]	2,953		475		86		
General Health (poor to fair)	15.1	(13.0, 17.4)	18.4	(13.0, 25.4)	35.5	(20.1, 54.7)	0.0812
Depression (past 30 days)	16.7	(14.7, 19.0)	23.0	(17.0, 30.4)	26.9	(15.9, 41.8)	0.0706
Depression (past 12 months)	25.5	(23.0, 28.1)	31.7	(25.0, 39.4)	35.5	(21.6, 52.3)	0.1368

[1] Unweighted N refers to the total number of respondents who were in this category for this question
[2] Percentages and 95% CI are calculated using the weighted N
[3] P-value from chi-square test for differences across groups
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Figure 11 presents differences between the baseline survey (BGPS) and the follow-up survey (FGPS) in physical and mental health status by gambler group. Recreational gamblers in 2021 were significantly more likely than recreational gamblers in 2013 to identify their physical health status as poor or fair as opposed to good or excellent and to say they had experienced serious problems with depression, anxiety, or other mental health problems in the past 30 days and in the past year. Differences in physical and mental health among at-risk and problem gamblers in 2013 and 2021 were not statistically significant. Effect sizes for all of these differences were small (0.01 to 0.28).

Figure 11. Differences in physical and mental health by gambling group in 2013 and 2021





Tobacco, Alcohol, and Illicit Drugs

Table 27 presents information about tobacco, alcohol, and illicit drug use among recreational, at-risk, and problem gamblers in Massachusetts. The table shows that problem gamblers were significantly more likely than recreational gamblers to use tobacco. Although the table shows that problem gamblers were the group most likely to have used illicit drugs in the past year, differences across the gambler groups were not statistically significant due to the small size of the problem gambler group.

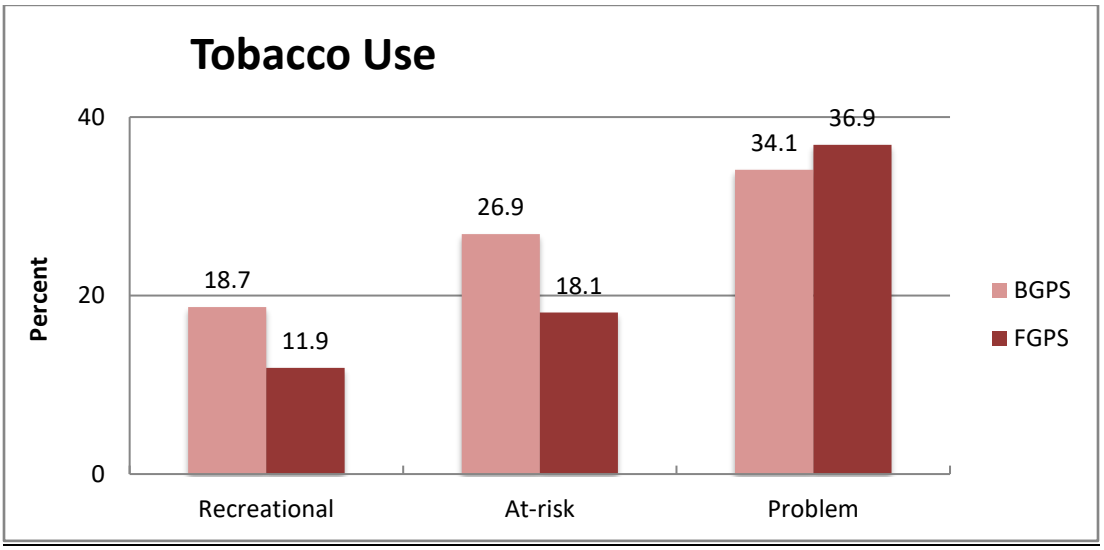
Table 27. Tobacco, alcohol, and drug use by gambling group

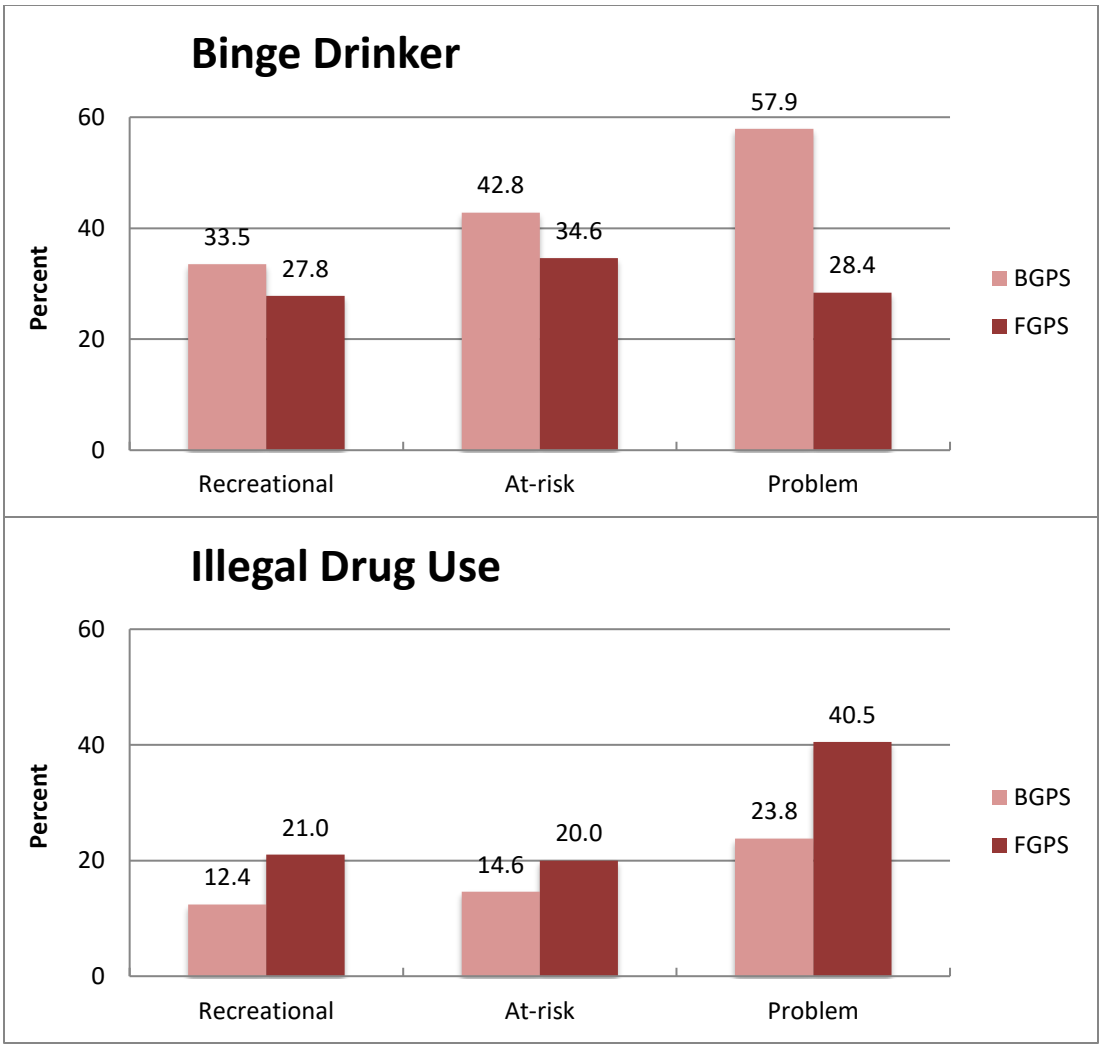
		Recreational gamblers		At-risk gamblers		Problem gamblers		
		%[2]	95% CI[2]	%[2]	95% CI[2]	%[2]	95% CI[2]	p-value[3]
Unweighted N[1]		2,953		475		86		
Tobacco use	Yes	11.9	(10.0, 14.0)	18.1	(13.3, 24.2)	36.9	(19.9, 57.8)	0.0159
Binge drinker (past 30 days)	Yes	27.8	(24.8, 30.9)	34.6	(26.6, 43.5)	28.4	(15.6, 45.9)	0.3540
Illegal drug use (past 12 months)	Yes	21.0	(18.5, 23.6)	20.0	(14.9, 26.2)	40.5	(23.1, 60.6)	0.2396

[1] Unweighted N refers to the total number of respondents who answered this question
[2] Percentages and 95% CI are calculated using the weighted N
[3] P-value from chi-square test for differences across groups
Note: Table 81 in Appendix G provides additional information about alcohol use and problems with alcohol or drugs (in past 12 months)

Figure 12 presents differences between the baseline survey (BGPS) and the follow-up survey (FGPS) in tobacco, alcohol and drug use by gambler group. Recreational gamblers in 2021 were significantly less likely than recreational gamblers in 2013 to have used tobacco and to have binged on alcohol in the past 30 days but significantly more likely to have used illicit drugs in the past year. Problem gamblers in 2021 were significantly less likely than problem gamblers in 2013 to have binged on alcohol in the past 30 days. There were no significant differences in any of these behaviors among at-risk gamblers in 2021 compared with those in 2013. Effect sizes for all of these differences were small (-0.60 to 0.36).

Figure 12. Differences in tobacco, alcohol, and drug use by gambling group in 2013 and 2021





Summary

In this section of the report, we have examined similarities and differences across groups of gamblers with the goal of better understanding the majority of people who gamble without developing problems and to identify characteristics common among individuals classified as at-risk or problem gamblers. We have presented information on the demographic characteristics, gambling participation rates, reasons for gambling, gambling expenditures, and some social, health, and financial impacts of gambling across recreational, at-risk, and problem gamblers.

There appear to have been some changes in the proportion of gambling expenditures accounted for by different groups of gamblers, and in the physical and mental health of different groups of gamblers. We noted that at-risk gamblers accounted for an even larger proportion of total gambling expenditures in 2021 than in 2013. We identified that at-risk and problem gamblers in 2021 were no longer more likely than recreational gamblers to have experienced depression, anxiety or other mental health problems in the past month or past year. Finally, we noted some changes between 2013 and 2021 in tobacco, alcohol and drug use among different groups of gamblers with less tobacco use and alcohol bingeing but more drug use among recreational gamblers and less alcohol bingeing among problem gamblers.

It is likely that some of the differences between recreational, at-risk, and problem gamblers are the result of correlations with underlying factors. For example, statistically significant differences across the groups in employment or household income may actually be due to respondents' age. Going forward, we plan to conduct deeper analyses to determine which variables remain predictive of at-risk and problem gambling status after controlling for such correlations in order to assess the relative importance of different risk and protective factors. Identifying important risk and protective factors, in turn, will allow us to make evidence-based recommendations for developing problem gambling prevention, outreach, and treatment initiatives in Massachusetts.

Awareness of Problem Gambling Services in Massachusetts

Previous research has found that over time, many problem gamblers recover without the aid of professional treatment. Indeed, the literature indicates that the number of people who have recovered on their own may greatly exceed the number of people who ever seek treatment (Castellani, 2000; Hodgins, Currie, el-Guebaly, & Peden, 2004; Korn & Shaffer, 1999). This research indicates that the behavior of problem gamblers may be more susceptible to change than was previously thought. The research also highlights the importance of increasing public awareness and developing brief, targeted interventions to prompt changes in attitudes and behavior among individuals experiencing mild or moderate difficulties to reduce their progression toward more severe gambling-related problems.

One goal of the FGPS was to collect information about the public's knowledge of available resources for addressing gambling problems in Massachusetts. In previous sections of this report, we presented information about specific subgroups in the population who were at risk of, or were already, experiencing difficulties related to their gambling. In this section, we present information about awareness of problem gambling services in the adult population of Massachusetts. This information is important in the design of general and targeted awareness and prevention programs and in the development of strategies to provide help to groups harmed by gambling in Massachusetts.

Awareness of Problem Gambling Prevention Efforts

All of the respondents in the survey were asked whether they had seen or heard any media campaigns to prevent problem gambling in Massachusetts in the past 12 months. Respondents were also asked whether they were aware of any programs to prevent problem gambling offered in their schools, workplaces, or communities in the past 12 months.

Overall, 20.9% of respondents indicated that they were aware of media campaigns to prevent problem gambling in Massachusetts in the past year. The rate of awareness of media campaigns to prevent problem gambling in 2021 was about half of the level of awareness in 2013 (41.0%) but the effect size was small (-0.44). It is concerning that awareness of problem gambling prevention efforts is lower than in 2013 since there are now substantially more gambling opportunities in Massachusetts (three casinos and legalized sports betting). Given available resources, we anticipated that awareness would be higher in 2021 compared to 2013.

Table 82 in Appendix H presents rates of awareness of media campaigns overall as well as by gambling group in the FGPS. The table shows that awareness of media campaigns to prevent problem gambling was significantly higher among recreational, at-risk and problem gamblers compared with non-gamblers.

There were differences in awareness of media campaigns to prevent problem gambling by demographics. Men, adults aged 25 to 79, Whites, and employed individuals were more likely to indicate awareness of media campaigns compared to women, adults aged 21 to 24, Hispanics and Asians, and students (see Table 83 in Appendix H).

Approximately one in ten respondents (9.2%) indicated that they were aware of programs to prevent problem gambling offered in schools, workplaces or in the community in the past year. As with awareness of media campaigns, awareness of local problem gambling prevention programs was lower in 2021 compared with 2013 (13.1%) but, again, the effect size was small (-0.13). Awareness of such programs was significantly higher among recreational and at-risk gamblers compared with non-gamblers in the FGPS, as shown in Table 82. There were no significant differences in the demographics of those who indicated they were aware of non-media campaigns to prevent problem gambling (see Table 83 in Appendix H).

How Many Problem Gamblers to Plan For?

Accessing treatment for problem gambling is an important social and economic impact of gambling that merits consideration. Helpline calls and treatment numbers at government-funded agencies provide some idea of the magnitude of this impact, although these numbers usually reflect only the 'tip of the iceberg,' as most problem gamblers do not seek formal treatment, and when they do, it is often not with these types of agencies.

Although questions about wanting and seeking help for gambling problems were included in the FGPS, the number of individuals endorsing either of these questions was too small to report (cell sizes of five or less). Recent survey data from Connecticut (which included questions very similar to the FGPS) provide some useful data points: in 2022, 24.9% of Connecticut adults who were classified as problem gamblers indicated that they had wanted help for gambling problems in the past year and 20.7% indicated that they had sought help. The large majority of Connecticut problem gamblers did not want external help, preferring to try curbing their gambling on their own, although a minority were deterred from seeking help because of stigma, perceived costs, or being unaware of where to get help. The people who did seek help in Connecticut accessed a wide variety of sources, but self-help materials, voluntary self-exclusion, and support from family and/or friends were the most commonly accessed sources rather than state-funded treatment services. Although help-seeking was low in Connecticut, the majority of people who did seek help found this assistance somewhat, quite or very helpful in controlling their gambling (Gemini Research, 2023).

In calculating the number of problem gamblers who might seek treatment in Massachusetts, we focused on the group of individuals who scored as problem gamblers in the FGPS (i.e., the approximately 78,000 individuals represented by the point estimate for problem gambling in the survey) along with estimates of treatment-seeking from other jurisdictions where prevalence surveys have been conducted in recent years. Using this approach, we estimate that the number of individuals that could seek treatment for a gambling problem on an annual basis in Massachusetts is between 2,340 and 5,460 (or between 3% and 7% of those classified as problem gamblers in the FPGS).

Problem Gambling Services in Massachusetts

The Office of Problem Gambling Services (OPGS) in the Massachusetts Department of Public Health is responsible for problem gambling prevention, treatment and recovery services in Massachusetts and is funded by the Public Health Trust Fund which was created by the Expanded Gaming Act. OPGS sponsors a range of programs and activities including the state's public awareness campaigns, community initiatives, the Massachusetts Technical Assistance Center for Problem Gambling, the Massachusetts Center of Excellence on Problem Gambling Prevention, and the problem gambling helpline. Given the level of funding in Massachusetts for problem gambling services ($4.6 million in FY2021; $8.0 million in FY2022), it is unclear why awareness of the availability of services for those experiencing gambling problems in Massachusetts was lower in 2021 compared to 2013 (MA OPGS Annual Report Fiscal Year 2021; MA OPGS Annual Report Fiscal Year 2022).

The first annual report of the Massachusetts Problem Gambling Helpline indicates that a total of 1,378 calls from individuals seeking help for a gambling problem were received in FY2022 along with 56,455 unique visitors to

the helpline's new dedicated website (MA Problem Gambling Helpline, 2023). These numbers represent approximately 1.8% and 72.4% of the estimated total number of problem gamblers in Massachusetts in 2021.

Summary

Although data from the FGPS is helpful in elucidating the population-level awareness of problem gambling prevention and treatment in Massachusetts, other SEIGMA research activities are expected to more meaningfully capture information about treatment desire, treatment-seeking, and the barriers people in Massachusetts face in seeking help for gambling problems.

The SEIGMA team has completed two online panel surveys in Massachusetts: the FOPS in March 2022 and OPS23 in April 2023. Both surveys included questions about wanting and seeking help for gambling problems as well as the source of help that was sought and whether individuals had entered into a self-exclusion agreement in the past year. Online panel surveys differ from population surveys because they involve groups of respondents who have agreed to participate in a variety of surveys for some form of compensation. Because respondents are not randomly selected to participate, online panel surveys are not representative of the population. However, such panels consistently have much higher rates of regular gambling and problem gambling compared to population samples. We anticipate that the much higher prevalence of regular gambling and problem gambling in both the FOPS and the OPS23 will allow us to examine the issue of help-seeking among problem gamblers in Massachusetts in a more meaningful way in the future.

Summary and Conclusion

The main purpose of the Follow-up General Population Survey (FGPS) was to determine whether and how gambling attitudes, gambling behavior, and problem gambling prevalence changed in Massachusetts following the introduction of casinos. In addition to these overall assessments, we explored whether the demographic and behavioral patterns of gambling as well as problem gambling prevalence changed in Massachusetts between 2013 and 2021. Drawing from these two aims and an understanding of the research literature, we generated five hypotheses that could be answered, to a greater or lesser extent, using data from the survey.

Answering the Research Questions

In this section, we summarize the results of our hypothesis testing to address the concerns posed at the beginning of this report. The following table shows that three of the hypotheses, related to attitudes toward gambling, casino gambling participation and problem gambling prevalence, were not supported. One of the hypotheses, related to participation in lottery games, was partly supported. Only the hypothesis that sports bettors in Massachusetts would differ, demographically and behaviorally, from gamblers who did not bet on sports was fully supported.

Table 28. Summary of hypothesis tests

H1	Attitudes towards casinos will be **less negative** in the FGPS than in the BGPS, reflecting Massachusetts adults' experience with casino gambling in the Commonwealth.	Not supported
H2	Participation in casino gambling will be **higher** in the FGPS than in the BGPS, reflecting the impact of the introduction of casinos in Massachusetts.	Not supported
H3	Participation in lottery games will be **lower** in the FGPS than in the BGPS, reflecting shifts in gambling participation and expenditures following the introduction of casinos in Massachusetts.	Partly supported
H4	The prevalence of problem gambling will be **higher** in the FGPS than in the BGPS, reflecting the increase in gambling availability in Massachusetts.	Not supported
H5	Individuals participating in sports betting in Massachusetts will **differ** from individuals participating in other types of gambling.	Supported

Changes Since 2013

There have been changes in gambling attitudes and behavior since the Baseline General Population Survey (BGPS) was carried out in 2013. One interesting finding related to attitudes is the increase in the proportion of Massachusetts adults who believed that gambling was too widely available prior to the legalization of sports betting in the Commonwealth. Another interesting finding relates to the perceived impacts of the introduction of casinos in Massachusetts. Although employment, recapture of gambling spend, and increased government revenue have been observed statewide (Hall, 2019; Peake & Breest, 2020; Salame et al., 2023; Salame et al., 2020; Salame et al., 2017; SEIGMA Research Team, 2017, 2020a, 2020b, 2022) and traffic and crime impacts have been observed in the casino host and surrounding communities (Bruce, 2018, 2021, 2022; Justice Research

Associates, 2023), it is notable that we did not identify a change in problem gambling prevalence in Massachusetts since 2013.

Somewhat surprisingly, given the widespread assumption that increases in the availability of gambling will lead to increases in gambling participation, we identified declines in participation for every type of gambling included in the survey except for daily lottery games and online gambling. Although some part of the decline may be due to lingering effects of the COVID-19 pandemic, we believe that some of these changes are also explained by longer trends in North American gambling participation and problem gambling prevalence. Gambling participation rates in North America peaked in the late 1990s and early 2000s and have been declining ever since. The 1990s and early 2000s was the period with the most rapid introduction and expansion of legal gambling opportunities in North America (particularly EGMs and casinos), the greatest increase in per capita gambling expenditure, and the peak in the overall rate of gambling participation (Gemini Research, 2023; Volberg & Williams, 2014).

There were several changes in gambling behavior in Massachusetts between 2013 and 2021. For example, we observed a reduction in expenditures on lottery products and an increase in expenditures on casinos, sports betting, and online gambling. We also observed changes in the demographics of casino gamblers with none of the differences in gender, age, and race/ethnicity observed in 2013. Although we identified changes in the demographics of sports bettors with no difference any longer in educational attainment compared to the adult Massachusetts population, there were significant demographic and behavioral differences between sports bettors, other gamblers, and the adult population in Massachusetts in 2021.

It is notable that there has been no significant change in the prevalence of at-risk and problem gambling in Massachusetts between 2013 and 2021. As in 2013, the problem gambling prevalence rate in Massachusetts in 2021 is in the middle of the range of prevalence rates identified in other states in the same period.

In our comparison of recreational, at-risk, and problem gamblers in Massachusetts in 2021, we noted that at-risk and problem gamblers in 2021 were more likely to gamble for excitement or entertainment and less likely to gamble to win money compared to 2013. Another important change from 2013 is that at-risk gamblers accounted for a much larger proportion of total gambling expenditures in 2021. A third change since 2013 is that there are no longer significant differences in rates of depression, anxiety and other mental health problems between recreational gamblers and at-risk and problem gamblers. We also noted changes between 2013 and 2021 in the tobacco, alcohol, and drug use of different groups of gamblers with less tobacco use and alcohol bingeing but more drug use among recreational gamblers and less alcohol bingeing among problem gamblers. Finally, we identified a substantial reduction in awareness of problem gambling prevention media and non-media campaigns between 2013 and 2021 although it does appear that the website of the Massachusetts Problem Gambling Helpline is serving as an important resource among individuals experiencing gambling problems in the Commonwealth as well as affected others.

Strengths and Limitations of the Study

Strengths

A primary concern when designing the FGPS was that the data needed to be representative of the state of Massachusetts. The introduction of a multimode survey approach as well as the Address Based Sampling (ABS) design allowed for a more inclusive sample comprising households without a telephone or who only own a cell phone and households without access to a computer or the Internet. In this respect, the FGPS had considerably higher coverage of the population than a telephone-only survey.

Use of standardized methods of data collection, including address-based sampling, multiple modes of data collection, and a highly-structured instrument reduced potential bias and enhanced the validity of the results. Strenuous efforts were made to recruit a fully representative sample of Massachusetts residents into the survey, including several mailings of advance letters and postcard reminders.

Limitations

There are some limitations to the FGPS as there were with the BGPS. One potential limitation is the response rate attained in the survey. Survey response rates internationally have fallen precipitously in recent years; this increases the likelihood that respondents differ from non-respondents in some important and systematic way, making the sample non-representative. Although this does not always occur (Curtin, 2000; Groves et al., 2006; Keeter, Miller, Kohut, Groves, & Presser, 2000), the risk is always present and tends to increase as a function of the degree of non-response. We attempted to minimize systematic bias by introducing the study as a survey of 'health and recreation' but the response rate for the FGPS was lower than desirable and, as a consequence, generalization of the results should be undertaken with care.

Another limitation is that the survey was restricted to adults living in households—the sample did not include adults living in group quarters, incarcerated individuals, or homeless individuals. Although rates of problem gambling tend to be very high in these groups, they represent only small proportions of the total population and research has shown that their inclusion is unlikely to affect the overall prevalence rate (Abbott & Volberg, 2006; Williams & Volberg, 2010).

A third limitation is that the questionnaire was translated into Spanish but not into other languages. Some communities in Massachusetts have high proportions of adults with no or limited English language abilities. By not providing for surveys in additional languages, we were unable to include such individuals in our sample. However, it is our belief that alternate research strategies, including community-engaged research funded by the MGC in recent years, are needed to fully explore the role of gambling in a variety of small but important cultural communities, including Asians and South Asians as well as immigrant and refugee communities.

A fourth limitation relates to the small size of several subgroups in the sample such that the prevalence rates of problem gambling in these groups are associated with large confidence intervals. These estimates should be viewed with caution because they may be unreliable. Finally, it is important to emphasize that, like other prevalence surveys, the FGPS is a cross-sectional 'snapshot' of gambling and problem gambling at a single point in time. This limits our ability to draw any causal conclusions from associations reported between gambling participation, gambling problems, and other variables in Massachusetts.

Future Directions

When the results of a new problem gambling prevalence study are published, policymakers and the media generally focus their attention on a single number—the overall rate of problem gambling in the general population. Comparisons are made with prevalence rates in other jurisdictions and questions are asked about the number of people that this overall rate represents and how many of them may seek treatment if specialized services are made available. Although these are important reasons for conducting prevalence studies, there is much more to be learned by looking beyond the overall prevalence rate. There is also much more to be learned through additional analyses of the data from the Follow-up General Population Survey (FGPS), from additional research activities, and from future surveys of gambling and problem gambling in Massachusetts.

In our report on the baseline survey (BGPS), we identified plans to carry out deeper analyses of the data, using multivariate approaches to examine relationships between attitudes toward gambling and participation in specific gambling activities as well as relationships between clusters of gambling activities and demographics.

We also planned multivariate analyses to assess relationships between at-risk and problem gambling and demographics, gambling involvement, and comorbid conditions (Volberg et al., 2017). Since the baseline report was published, we have published a number of reports and journal articles that include these analyses. For example, beginning in 2017, we published the results of analyses of the predictors of at-risk and problem gambling in the BGPS in a report (Williams, Zorn, et al., 2017) and in several academic publications that focused on the importance of family and friends in predicting gambling problems and differential predictors of gambling problems among women and veterans (Freeman, Volberg, & Zorn, 2020; Mazar et al., 2018; Venne, Mazar, & Volberg, 2020). We used combined data from the BGPS and the Baseline Online Panel Survey (BOPS) to examine gambling-related harms in Massachusetts in detail with a focus on different harms reported by key demographic groups as well as identifying the riskiest forms of gambling in Massachusetts (Mazar, Zorn, Becker, & Volberg, 2020; Volberg, Evans, Zorn, & Williams, 2020). We also used the combined BGPS and BOPS data to examine gambling harms and the 'prevention paradox' which posits that the majority of harms experienced by gamblers in the population occur among recreational gamblers and at-risk gamblers rather than among problem gamblers, although individual experiences of harm are far higher among problem gamblers (Volberg, Zorn, Williams, & Evans, 2021a, 2021b). These papers underscored the importance of universal prevention efforts aimed at altering unhealthy or unsafe behaviors in addition to selective and indicated prevention measures. The combined BGPS and BOPS data also supported an examination of predictors of treatment-seeking among people experiencing gambling problems in Massachusetts by comparing individuals who wanted treatment with those who did not (Evans, Zorn, & Volberg, 2020). Finally, we were able to examine sports betting behavior in Massachusetts in detail ahead of the legalization of sports betting in Massachusetts, using data from the BGPS, the BOPS, the Follow-up Online Panel Survey (FOPS) and the separate Massachusetts Gambling Impact Cohort (MAGIC) study (Volberg et al., 2022).

Going forward, we anticipate carrying out a number of investigations using data from the Follow-up General Population Survey (FGPS) alone and in concert with other surveys conducted by the SEIGMA research team. For example, in 2024, we will produce a report comparing the results of the FOPS (completed in 2022) and the 2023 Online Panel Survey (OPS23), which employed similar methods and questions as the FOPS, to assess relative changes in gambling behavior and problem gambling prevalence in Massachusetts between 2022 and 2023. Also in 2024, we will produce our second integrated report assessing all of the social and health as well as economic and fiscal impacts of legalized gambling in Massachusetts since 2013. We anticipate taking a deeper look at changes in gambling participation identified in the FGPS using data from BOPS, FOPS, and OPS23 to see if it is possible to disentangle COVID-19 related declines from longer term declines in gambling participation. We also anticipate analyzing the gambling expenditure data from the FGPS in more detail to better understand how the spending of recreational, at-risk, and problem gamblers affects the casino and sports betting industries in Massachusetts.

The descriptive statistics presented in this report tell us a great deal about gambling attitudes, gambling behavior, gambling problems, and prevention awareness in Massachusetts in 2021. The FGPS dataset will continue to enrich our understanding of gambling and problem gambling in Massachusetts through additional analyses and research activities. Additionally, all of the data collected by the SEIGMA team will be made public over time to enable other researchers and stakeholders to interact with the data and conduct their own analyses, adding to the body of knowledge about gambling in Massachusetts.

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Appendix A: Definitions of Terms

The Gambling Continuum

Gambling is a broad concept that includes diverse activities, undertaken in a wide variety of settings, appealing to different types of people, and perceived in various ways. For this report, we define gambling as "betting money or material goods on an event with an uncertain outcome in the hope of winning additional money and/or material goods" (Williams, Pekow, et al., 2017). This definition includes activities that are typically identified as gambling (i.e., electronic gaming machines, casino table games, sports betting, private wagering, bingo, horse race betting) as well as activities about which there is sometimes less public consensus (i.e., raffles, lottery tickets).

The concepts of gambling and gambling participation exist on a continuum, which is represented in Figure 13. Individuals who do not gamble (non-gamblers) are located at one end of this continuum and individuals who experience problems with their gambling (problem and severe problem gamblers) are located at the opposite end of this continuum. This figure underscores our view of gambling problems as highly dynamic; individuals can move in and out of points along this continuum at different times in their lives. For example, a non-gambler could begin gambling or an at-risk gambler could develop into a problem gambler. The concept of a gambling continuum is supported by mounting evidence that gambling problems may not necessarily be chronic and progressive. Indeed, a substantial proportion of the difficulties linked to gambling occur in persons who engage in risky gambling behavior but who do not meet the criteria for the recognized psychiatric diagnosis of Gambling Disorder (Korn & Shaffer, 1999; Toce-Gerstein et al., 2003).

Figure 13. The gambling continuum

As mentioned above, some people, who we refer to as ***Non-Gamblers*****,** do not gamble for various reasons. Others gamble because they enjoy and obtain benefits from gambling activities. Throughout this report, we refer to this group of people as ***Recreational Gamblers***. For most recreational gamblers,

gambling is generally a positive experience; however, for some people, gambling is associated with difficulties of varying severity and duration. Some regular, recreational gamblers develop significant, debilitating problems that result in harm to themselves, people close to them, and to the wider community, but others do not (Abbott, Volberg, Bellringer, & Reith, 2004).

At-Risk Gambling includes a broad range of gambling behaviors (e.g., persistently betting more than planned or spending more time gambling than intended, chasing losses, and borrowing money to gamble) as well as biased cognitions (e.g., superstitions, illusions of control, and misunderstandings about the nature of probability and randomness). Although at-risk gambling is not a clinically defined condition, it is generally viewed as gambling in ways that may pose a risk of physical or emotional harm to the gambler or others but has not produced effects that would result in a clinical diagnosis. At-risk gamblers are of interest because they represent a much larger proportion of the population than problem and severe problem gamblers. This group is also of interest because of the possibility that their gambling-related difficulties may become more severe over time. Additionally, public awareness and education campaigns may be more effective at changing at-risk gambling behavior than more entrenched and severe gambling problems (Hodgins & el-Guebaly, 2000; Shaffer & Korn, 2002).

Problem Gambling typically refers to individuals who experience impaired control over their gambling behavior and negative consequences arising from this impaired control. The definition of problem gambling used in this report is "difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community." This definition incorporates both the notion of an underlying condition as well as its consequences (Neal et al., 2005: 125).

Severe Problem Gambling sits at the most severe end of the continuum of problematic gambling involvement. Similar to problem gambling, it is characterized by impaired control over gambling and significant negative consequences deriving from this impaired control. However, in contrast to problem gambling, both the loss of control and the negative consequences are more extensive and severe. This, in turn, creates a more chronic and debilitating condition for the person experiencing it.[10] Chronic disorders are likely to recur once fully developed, giving those who experience them a lifelong vulnerability. This vulnerability to relapse may be effectively treated and kept in check; however, a period in which an individual is relatively free of symptoms does not mean that the person is free of the disorder.

In epidemiological research, individuals are generally categorized as at-risk, problem, or severe problem gamblers on the basis of their endorsement of items included in one of the many instruments developed to identify individuals with gambling-related difficulties (Abbott & Volberg, 2006; Stinchfield, Govoni, & Frisch, 2007; Williams & Volberg, 2014). Because these instruments were developed at different points in time and used different clinically diagnostic criteria, they use different terms to classify gamblers, including problem gamblers, pathological gamblers, and disordered gamblers. To limit confusion about these terms, we use problem gambling throughout this report as an umbrella term that encompasses the full range of loss of control as well as gambling harms and consequences that an individual may experience. A more thorough explanation of the evolution of this term and the scale we used to measure problem gambling in Massachusetts can be found in Chapter 5 of this report (see *Problem Gambling in Massachusetts*).

[10] This greater chronicity has recently been confirmed in longitudinal cohort research (el-Guebaly et al., 2015a; Williams et al., 2015).

A Note about Terminology Used to Describe Problem Gambling

Historically, various terms have been used to describe problem gambling, including compulsive gambling, addictive gambling, pathological gambling, and disordered gambling. Prior to 1980, compulsive gambling was the preferred term both in the scientific community as well as by members of Gamblers Anonymous. In 1980, gambling problems were first formally recognized in the third edition of the Diagnostic and Statistical Manual (DSM-III) of the American Psychiatric Association (1980). Within the DSM-III and DSM-IV, the disorder was called pathological gambling and was classified in the *Impulse-Control Disorders Not Elsewhere Classified* section. In the 1990s, the term problem gambling became more popular due to new research showing that gambling problems varied in severity and that many people did not have the chronic, unremitting course that pathological gambling implied (pathological means 'disease-like' and the DSM-III criteria specified no time frame for the symptoms, implying that it was a lifelong disorder).

Each revision of the DSM has seen changes in the diagnostic criteria for what was initially called pathological gambling. In the latest version of the manual (DSM-5), pathological gambling was re-named gambling disorder and was moved to the *Substance-Related and Addictive Disorders* section. These changes were intended to reflect research findings that *gambling disorder* is similar to substance-related disorders in clinical expression, neurological origin, comorbidity, physiology, and treatment (American Psychiatric Association, 2013). In addition to changes in naming and placement, the number of diagnostic criteria was reduced from 10 to 9, the minimum number of criteria required for diagnosis was lowered from 5 to 4, *levels* of Disordered Gambling were introduced (mild, moderate, severe), and a 12-month time frame was specified.

Problem gambling has become the preferred term amongst researchers and most clinicians because it has fewer etiological connotations and because it is inclusive of less severe forms.[11] However, given the evolution of the disorder described above, pathological gambling is still sometimes used to refer to the most severe and chronic forms of problem/disordered gambling. It is also worth noting that all of the above terms continue to be used as formal diagnostic categories in the assessment instruments most commonly used to classify individuals with a gambling problem. For example, "gambling disorder" is used in the DSM-5; "severe problem gambling" is used in the Canadian Problem Gambling Index (Ferris & Wynne, 2001); "problem gambling" and "pathological gambling" are used in the Problem and Pathological Gambling Measure (PPGM) (Williams & Volberg, 2010, 2014); and "probable pathological gambling" is used in the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987).

[11] A search of Google Scholar shows that the term "problem gambling" is now used in scholarly articles eight times more frequently than "pathological gambling," "disordered gambling," or "compulsive gambling."

Appendix B: Methods

This appendix describes the methodology and statistical techniques employed in the 2021 Follow-up General Population Survey.

Appendix B1 describes the considerations that were taken into account in determining the composition and sample size of the Follow-up General Population Survey.

Appendix B2 describes in detail how the Follow-up General Population Survey was fielded. This includes information about ethical and peer review, development and final content of the questionnaire, and how the survey was designed and conducted to obtain a representative sample of the adult Massachusetts population. This section concludes with a description of the data preparation procedures.

Appendix B3 presents information about sample implementation and response rate provided to the SEIGMA research team by NORC.

Appendix B4 details the procedures that were implemented to weight the obtained data to the Massachusetts adult population.

Appendix B5 presents response rates for each question in the survey separately by mode of data collection (online, SAQ and telephone).

Appendix B1: Sample Size and Composition

There were four considerations in determining the composition and sample size of the FGPS:

1. The first was the need to produce reliable estimates (i.e., relative standard error (RSE) of less than 30%) of problem gambling as a function of gender, age, and race/ethnicity. The sample sizes for this requirement were completely unknown for the BGPS, as a problem gambling prevalence study had not been conducted in Massachusetts since 1989 (Volberg, 1994). As a consequence, as seen below in Table 29, the problem gambling estimates for a few subgroups had a RSE > 30% (age 18-29; Hispanic, Asian, and Other Ethnicity).

Table 29. Gambling Categorization Prevalence in 2013/2014 BGPS (weighted)

		Unweighted Sample	Non-Gambler	Recreational Gambler	At-Risk Gambler	Problem Gambler
Gender	Male	3.787	22.3%	63.9%	10.7%	3.1%
	Female	5.632	30.3%	62.1%	6.5%	1.1%
Age	18-29	813	35.2%	54.1%	9.1%	1.6%
	30-49	2485	23.2%	65.4%	9.5%	2.0%
	50-64	2910	20.7%	68.5%	8.0%	2.8%
	65+	2853	28.8%	61.5%	7.7%	1.9%
Race/ Ethnicity	White	7,925	23.5%	67.0%	7.8%	1.7%
	Hispanic	474	35.6%	49.3%	12.8%	NSF
	Black	361	34.3%	47.3%	12.3%	6.1%
	Asian	363	42.9%	46.4%	8.3%	NSF
	Other	83	45.7%	44.5%	NSF	NSF
Overall		9,523	26.6%	62.9%	8.4%	2.0%

Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

We conservatively assumed that the prevalence of problem gambling in 2020 would be similar to 2013/2014 which allowed us to estimate the sample size needed to ensure an RSE < 30% for each demographic grouping in the FGPS using the following four steps:

1	The standard error (SE) of the proportion of problem gamblers (PG) in the BGPS (where N is the BGPS sample size) is determined by:	$\sqrt{\frac{PG \times (1 - PG)}{N}}$
2	The relative standard error (RSE) of the proportion of problem gamblers (PG) in the BGPS is the SE divided by PG:	$\sqrt{\frac{PG \times (1 - PG)}{N}}$ /PG
3	Thus, the sample size (N) necessary for a RSE of 30% is determined by the following equation:	$0.30 = \sqrt{\frac{PG \times (1 - PG)}{N}}$ /PG
4	Solving for N:	$N = \frac{1 - PG}{.09 \times PG}$

The percentage of problem gamblers among Hispanics is 2.3% from the BGPS. Using the above equation, the sample size (assuming simple random sampling and complete response) necessary to ensure a RSE of 30% is 472. The resulting SE is 0.0069, so that the RSE=0.3=0.0069/0.023. However, using the weights associated with respondents in the BGPS, the estimated standard error of the prevalence of problem gambling in Hispanics is 0.0106, not 0.0069. The difference in standard error is a consequence of using weights to estimate the population prevalence. However, using weights increases the variance of the estimate, because the weighted sample is no longer a simple random sample. Because we planned to use weights to estimate population prevalence, we adjusted the sample size estimates to account for the weighting. The weighting adjustment

factor (WF), is given by the ratio of the variance using weights, to the variance without weights. For Hispanics in the BGPS, $WF = \frac{0.0106^2}{0.0069^2} = 2.37$. This means that, rather than a sample size of 472, we needed a sample size of 1,119 in order for the RSE of the weighted estimated prevalence of gambling among Hispanics to be 30%. The WF is similar to the 'design effect' that is used to account for more complex sampling designs than simple random sampling.

Table 30 shows the sample sizes necessary for each subgroup to obtain reliable estimates for gender, race/ethnicity, and age. These tables also contain the *actual minimum sample size* that takes into account the cost and practicality of obtaining the sample and recognizes that it is quite possible there has been some increase in problem gambling rates from 2013/2014, which would result in lower sample sizes being required.

Table 30. Sample Sizes for Reliable Problem Gambling Estimates by Demographic Groupings in the FGPS

Group	BGPS Sample Size	BGPS PG Proportion (PG)	BGPS Standard Error (SSE)	Standard Error (SE)	Weight Factor (WF)	FGPS Sample Size for RSE=30%	FGPS Sample Size with WF	Actual Minimum FGPS Sample Size
Male	3,787	.031	.0045	.0028	2.553	347	887	**2,500**
Female	5,621	.011	.0022	.0014	2.506	999	2,503	**2,503**
Hispanic	474	.023	.0106	.0069	2.370	472	1,119	**1,119**
Black	361	.061	.0176	.0126	1.952	171	334	**1,000**
Asian	363	.025	.0164	.0082	4.005	433	1,736	**1,000**
White	7,925	.017	.0022	.0015	2.295	642	1,475	**1,475**
18-29	813	.016	.0059	.0044	1.798	683	1,228	**1,228**
30-49	2,485	.020	.0047	.0028	2.801	544	1,525	**1,525**
50-64	2,910	.028	.0051	.0031	2.781	386	1,073	**1,073**
65+	2,853	.019	.0039	.0026	2.328	574	1,336	**1,336**

2. The second consideration in determining the size and composition of the FGPS was the need to be able to detect a significant increase in the overall prevalence rates of problem gambling from the BGPS. The table below identifies the sample sizes required in the FGPS to detect a significant increase in problem gambling from the BGPS, assuming an alpha of .05. As seen, a total sample of 2,925 is sufficient to detect a 25% increase in overall problem gambling (i.e., from 2.0% to 2.5%). However, this level of sensitivity is not possible for most of the demographic subgroups. Rather, as seen in the following table (Table 31), a 25% to 50% increase is detectible for all subgroups except the Hispanic, Asian, and 18-29 subgroups (a 100% increase in problem gambling rates is detectible in these latter groups).

Table 31. Sample Sizes Needed to Detect Increases in Problem Gambling in the FGPS (Z-test for two proportions)

Group	BGPS sample size	BGPS PG Proportion (PG)	FGPS Sample to Detect 25% Increase	FGPS Sample to Detect 33% Increase	FGPS Sample to Detect 50% Increase	FGPS Sample to Detect 100% Increase
Male	3,787	.031	**2,186 (.039)**	1,131 (.041)	364 (.047)	95 (.062)
Female	5,621	.011	12,510 (.014)	**3,315 (.015)**	1,054 (.017)	267 (.022)
Hispanic	474	.023	NP (.029)	NP (.031)	NP (.035)	**220 (.046)**
Black	361	.061	NP (.076)	NP (.081)	**468 (.092)**	54 (.122)
Asian	363	.025	NP (.031)	NP (.033)	NP (.038)	**246 (.050)**
White	7,925	.017	5,038 (.021)	**1,597 (.023)**	626 (.026)	163 (.034)
18-29	813	.016	NP (.020)	NP (.021)	NP (.024)	**280 (.032)**
30-49	2,485	.020	NP (.025)	1,546 (.028)	**778 (.030)**	63 (.040)
50-64	2,910	.028	4,191 (.035)	1,541 (.037)	**465 (.042)**	44 (.056)
65+	2,853	.019	18,147 (.024)	3,921 (.025)	**689 (.029)**	64 (.038)
Overall	9,578	.020	**2,929 (.025)**	943 (.028)	579 (.030)	60 (.040)

NP = not possible

Bolded indicates that the cell likely contains a sample size that will be achieved in the FGPS.

3. **The third consideration in the size and composition of the FGPS sample was that it needed to contain a large enough subsample from the Encore Boston Harbor Host and Surrounding Communities** so that a comparison could be made with BTPS-Everett (which was a subsample from the BGPS). The sample size for the BTPS-Everett was 1,155, which represented 12.1% of the BGPS. To date, all of the Follow-Up Targeted Surveys have employed samples roughly equivalent to what was obtained at the BTPS, which in this case is **1,155.** With a FGPS sample of 8,000 (see #4 below), this required some oversampling in this region.

4. **Similarly, the size and composition of the FGPS sample needed to contain a large enough subsample from the MGM Springfield Host and Surrounding Communities** so that a comparison could be made with BTPS-Springfield. The sample size for the BTPS-Springfield was 1,131. To date, all of the Follow-Up Targeted Surveys have employed samples roughly equivalent to what was obtained at the BTPS, which in this case is **1,131.** With a FGPS sample of 8,000, this required some oversampling in this region.

Appendix B2: Fielding the SEIGMA Follow-up General Population Survey

Ethical and Peer Review

The FGPS utilized an expanded version of the original SEIGMA questionnaire which underwent thorough review prior to the baseline survey. For additional information on the ethical and peer review process for SEIGMA, please refer to the BGPS report (Volberg et al., 2017 Appendix A).

Federal Certificate of Confidentiality

Due to the sensitive nature of certain topics within the survey, including questions regarding mental health, substance abuse, and crime, a certificate of confidentiality was submitted to and approved by the National Institute of Mental Health. The certificate protects against the disclosure of personally identifiable information.

IRB Review

All data collection efforts were subject to approval by the Institutional Review Boards (IRB) from both the UMass Amherst School of Public Health and Health Sciences and NORC. The questionnaire and all mailing materials were approved by the NORC IRB in July 2021 and by the UMass Amherst IRB in September 2021.

The informed consent process remained the same as the informed consent process for other SEIGMA surveys. The following consent statement was made available to respondents in each mode of the survey:

> *"The University of Massachusetts is conducting a study about health and recreational behavior in Massachusetts. This survey is private and confidential. We have a Federal Certificate of Confidentiality that is designed to protect the confidentiality of your research data from a court order or subpoena. We can provide you with more information if you would like. Taking part is up to you. You don't have to answer any question you don't want to, and you can stop at any time. Almost everyone will be able to finish the survey within 10 to 15 minutes."*

For web respondents, the informed consent statement was read as part of the screening process. A hyperlink was included to a list of frequently asked questions (FAQs) about the Federal Certificate of Confidentiality. If the respondent clicked 'Next' to move past the informed consent screen, he or she was presumed to be informed of his or her rights as a participant. For mail, the informed consent statement was printed on the inside cover of the hardcopy questionnaire with a link to the Federal Certificate of Confidentiality. Respondents returning a booklet with valid response data were considered to have provided consent. Finally, respondents completing by telephone were read the informed consent script. Interviewers captured consent by clicking 'Continue' if the respondent did not voice any objections. Respondents were also notified that the calls would be recorded. If the respondent objected, the interviewer would select that the respondent refused to be recorded.

All materials (letters, brochures, questionnaire) were submitted to both IRBs for review. As data collection progressed, any materials requiring modification or new materials not included in the original submission were sent as an amendment to the IRBs for review.

External Review

The draft report was reviewed by MGC staff and members of the MGC Research Review Committee. All of the feedback from the two rounds of review was carefully considered and much of the feedback was incorporated in the final report.

Questionnaire Content

The content of the questionnaire was guided by the aims of the SEIGMA study, the need to maintain comparability with previous gambling surveys in Massachusetts, interview length considerations, and opportunities to address gaps in the gambling research literature. The questionnaire was introduced to potential participants as a survey of "health and recreation," to improve the likelihood of interviewing a representative sample of the Massachusetts adult population.

Comorbidities

The questions that started the survey had two purposes. The first was to provide legitimacy to the "health and recreation" description of the survey to eligible respondents. The second purpose was to establish the presence or absence of typically reported comorbidities for problem gambling (e.g., substance use, mental health problems). All respondents were asked general questions about their preferred recreational activities and their physical and mental health status before more specific questions were posed about their use of tobacco (including vaping products), alcohol, cannabis and illicit drugs. Additional questions in this section inquired about respondents' perception of their physical health, experience of stress, and overall level of happiness. Ten questions were added in this section to assess relative deprivation to assist in measuring social determinants of health related to gambling.

Gambling Attitudes

All respondents were asked questions about their beliefs about the benefit versus harm of gambling, whether gambling should be legal, and their opinion about the availability of gambling opportunities in Massachusetts and in their own communities. Additional questions in this section assessed views about the overall impact of casinos in Massachusetts.

Past-Year Gambling Behavior

All respondents were asked about the frequency of their participation and their expenditures on 11 types of gambling, using questions with optimal wording for obtaining this information (Wood & Williams, 2007). Participation and expenditures were assessed for traditional, large jackpot lottery games, instant lottery tickets, daily lottery games, charitable raffles, sports betting, bingo, casino gambling (in Massachusetts and outside Massachusetts), parimutuel wagering on horse races, private wagering, high risk stocks and online gambling. All respondents were asked about the impact of the COVID-19 pandemic on their gambling behavior.

Gambling Motivation

Respondents who had gambled in the past year were asked one question about their primary motivation for gambling.

Gambling Recreation/Entertainment

Respondents who had gambled in the past year were asked about the importance to them of gambling as a recreational activity.

Prevention Awareness

All respondents were asked questions to assess their awareness of problem gambling prevention activities in Massachusetts. Prevention activities included media campaigns and programs offered in schools, workplaces or in the community.

Gambling Problems (Others)
All respondents were asked questions about the proportion of people in their own social circle who gambled regularly.

Gambling Problems (Self)
Respondents who had engaged in one or more of the gambling activities included in the Gambling Behavior section once a month or more often or indicated that gambling was an important recreational activity or had replaced other recreational activities in the past five years were administered two validated problem gambling instruments.

The first nine questions of this section comprise the Problem Gambling Severity Index (PGSI) from the Canadian Problem Gambling Index (CPGI) (Ferris & Wynne, 2001). The PGSI has very good internal consistency (alpha = .89) and good test-retest reliability (r = .78). Criterion validity is established by its correlation (r = .83) with the SOGS and DSM-IV. Construct validity of the PGSI is established by its significant correlations with gambling involvement.

The remaining questions in this section comprise the Problem and Pathological Gambling Measure (PPGM). The PPGM is a relatively new instrument with superior sensitivity, positive predictive power, diagnostic efficiency, and overall classification accuracy compared to the PGSI, DSM-IV, and SOGS (Williams & Volberg, 2010, 2014). The PPGM serves as the primary problem gambling measure in the Massachusetts gambling surveys and the PGSI provides a direct comparison to other gambling surveys conducted worldwide. The PPGM is described in detail in Appendix E: Gambling in Massachusetts.

Several branching questions were added to many of the PGSI and PPGM questions if the person answered the "stem" question in the affirmative. These supplemental questions provide an important quantification of the social and economic impacts of gambling in Massachusetts by assessing the number of bankruptcies, health care visits, suicide attempts, incidents of domestic violence, divorces, cases of child welfare involvement, illegal acts, arrests, incarcerations, and lost work/school days attributable to problem gambling.

Demographics
All respondents were asked about gender, age, marital status, number of children in the household, number of people in the household, highest level of education, employment status, veteran status, household income, immigrant status, and race/ethnicity. All respondents were also asked to provide contact information to allow the SEIGMA research team to reach them in the future and invite them to participate in related studies.

The survey was offered in English and Spanish languages and in two versions. In Version A, all of the gambling participation questions were identical to the questions included in the BGPS. In Version B, questions about several gambling activities were modified to reflect the emergence of new forms or modes of gambling since the baseline survey. Half of the respondents received the original questions and half received the modified questions to allow for an assessment of the impact of wording changes on responses to questions about these types of gambling.

Survey Design

Multi-Mode Process
Participants in the survey were selected by means of address-based sampling (ABS), a method that ensures each Massachusetts household may be included in the sample regardless of telephone access (Iannacchione, 2011;

Link, Battaglia, Frankel, Osborn, & Mokdad, 2008). In an effort to increase overall response rates, the survey was offered in three modes—web, mail, and telephone. Figure 14. Multi-mode data collection approach outlines this sequential multi-mode approach.

Figure 14. Multi-mode data collection approach

Batches 1 and 2 followed a four-step approach:

Batch 3 followed a three -step approach:

Sample Size

The original sample for the survey included 30,740 -housing units with a targeted yield of approximately 26% or 8,000 completes. Targets of 1,000 each were established for Asian non-Hispanics or Latinos and African-American non-Hispanics or Latinos. Targets of 1,120 and 1,400 were established for Hispanics or Latinos and young adults aged 18-29 years old regardless of race/ethnicity respectively. Sample was first released in two batches to facilitate mid-field adaptive design due to the potential for actual yield rates across the strata and demographic categories to be lower than projected. When the initial two batches returned fewer completes than projected, especially because of oversampling of demographic groups with lower response propensity, NORC fielded an additional 16,500-cases for the web survey only starting in February 2022.

Case Flow

Respondents were first invited to participate in the survey online.[12] If respondents did not complete the survey online, they were sent a hardcopy questionnaire with a postage-paid business reply envelope. Respondents who did not reply in the first two modes were contacted by telephone. Respondents could also call the study's toll-free line to complete the survey over the phone at any time. The next section provides further detail on the overall case flow.

Data Collection

The follow-up general population survey followed a similar data collection schedule compared with previous rounds of SEIGMA. Data collection for the FGPS began in September 2021 and concluded in April 2022.[13]

[12] The web survey remained open throughout data collection.

[13] The initial batch of cases released followed the full progression of mailings as described below. The supplemental batch released in February 2022 was a web and CATI-only batch and received a pre-notification mailing, a reminder postcard, a follow-up web letter, and a final reminder postcard.

Advance Letter Mailings

A series of mailings were scheduled to encourage respondent participation, to inform households about the survey, how they were selected, and to provide contact information for NORC and UMass Amherst. Following protocols outlined by Don Dillman and colleagues (2009), NORC utilized the following contacts:

Pre-notification mailing. Respondents were first mailed a web packet asking them to complete the survey online. Enclosed with this mailing was a web invitation letter, $5 bill pre-incentive, survey brochure, web insert outlining how to access the web survey, and a list of FAQs. The invitation letter informed respondents of the purpose of the study and provided a web link and Personal Identification Number (PIN) to access the survey. The letter also offered a $10 gift code if respondents completed the survey online within 14 days.

Thank-you/reminder postcard. A reminder postcard was then mailed thanking those who had previously completed the survey and reminding non-responders to complete the survey online.

Follow-up web letter. The postcard was followed with a second web packet mailing. The letter encouraged respondents to complete the survey online and included the web link and PIN to access the survey.

Initial questionnaire mailing. Those who had not completed the survey via the web were sent a SAQ packet. The SAQ packet included a letter, hardcopy questionnaire, postage-paid business reply envelope (BRE), $5 bill, and survey brochure. The letter provided instructions for completing the questionnaire online and for returning the questionnaire.

Thank-you/reminder postcard. A second reminder postcard was mailed thanking those who had previously completed the survey and reminding non-responders to complete the survey.

Follow-up questionnaire mailing. A second set of questionnaire mailing were sent to individuals who did not complete the survey via web or completed the initial SAQ packet. The SAQ packet included a letter, hardcopy questionnaire, postage-paid BRE, and survey brochure. The letter provided instructions for completing the questionnaire online and for returning the questionnaire.

Prior to each mailing, households that had already completed the survey were removed from the mailing list. Letters were typed on UMass Amherst letterhead with the signature of Dr. Rachel Volberg, Co-Principal Investigator. Each mailing provided the study's toll-free number and email address so that respondents could contact NORC with questions or requests for assistance. The data collection schedule for the mailing component for the targeted population survey is presented in Figure 15.

Figure 15. Data Collection Schedule for Batches 1 and 2

Respondent Contact	9/17	9/24	10/4	10/18	10/25	11/1	11/15	11/22	12/6	12/13	1/17 – 4/2
Web Letter 1	B1				B2						
Web Reminder Postcard		B1				B2					
Web Letter 2			B1				B2				
SAQ Packet 1				B1							
SAQ Reminder Postcard						B1			B2		
SAQ Packet 2								B1		B2	
Telephone Interviewing											B1 + B2

*Batch 2 did not receive another copy of the SAQ because of the low response rates received from Batch 1 SAQ.

Languages

The survey was offered in English and Spanish. Spanish-speaking households were flagged so that they would receive bilingual mail materials. Respondents were asked in the web screener whether they would like to continue the survey in English or Spanish. For those completing by telephone, a flagged case would be assigned a Spanish-speaking interviewer. Interviewers also had the option to switch languages at each screen during the survey.

Web Survey Procedures

The first web letter outlined the purpose of the survey and requested that the adult (18 years old or older) in the household who had the most recent birthday complete the study online. The website URL and unique Personal Identification Number (PIN) to access the survey were provided. The letter also stated that if the survey was completed online within 14 days, the respondent would receive a $10 gift code. This 14-day early bird incentive was offered with each initial web packet mailing.

Upon accessing the survey website, a welcome screen asked respondents to enter their assigned PIN. Respondents were then asked a short series of screener questions before continuing with the survey – if a respondent did not meet the eligibility requirements, he or she was taken to an exit screen. Eligible respondents would progress past the screener into the online instruments. Respondents could skip any question they did not wish to answer. If the web survey was completed within the 14-day window, respondents were asked at the end of the survey if they would like to receive the $10 Amazon gift code. If respondents answered yes, the next screen displayed the gift code. Respondents could then elect to have the gift code emailed to them.

Self-Administered Questionnaire (SAQ) or Mailed Survey Procedures

The SAQ packet was mailed approximately one month after the first web packet. The letter asked respondents to complete the enclosed hardcopy questionnaire and to return it in the postage paid envelope. The letter also provided the URL and PIN for completing online. The hardcopy questionnaire outlined instructions for completing the survey along with a confidentiality statement. The back cover contained instructions for returning the completed questionnaire to NORC as well as the study's toll-free number to complete the survey over the phone and the survey link and assigned PIN to complete online. This information was included in each mailing to provide respondents with several options for completing the survey.

NORC's Telephone Survey and Support Operations (TSSO) Department at NORC processed returned SAQs. A barcode was printed on each letter and SAQ allowing trained mail clerks to code each returned mailing

efficiently. Completed or partially completed SAQs were sent to Data Services, Inc. (DSI) for data entry. NORC provided DSI with a set of data cleaning rules to follow when entering responses. DSI sent electronic data files to NORC each week followed by the returned hardcopy questionnaires. Electronic data files were shared safely using the Secure File Transfer Protocol (SFTP).

Telephone Interviewing Procedures

NORC sent all sampled addresses to the vendor Marketing Systems Group (MSG) for matching telephone numbers.[14] NORC adopted the same procedures for uploading available phone numbers as used in the previous rounds of SEIGMA. Phone numbers were uploaded for cases that were not already finalized (e.g., completed survey online or by SAQ, requested to be taken off the mailing list). Cases assigned a phone number were then opened in the system for dialing.

The overall phone match rate for the sample was approximately 73.7% including inexact matches. There were phone cases uploaded and dialing began. Telephone surveys were conducted and monitored by the TSSO department.

Interviewer Training

Trained phone interviewers in the NORC Wichita, KS telephone center conducted interviews. Interviewers were closely monitored for technique and adherence to procedures. In addition to general training in telephone interviewing techniques, interviewers received training in the specific requirements for the study including screening eligible households and maintaining data integrity and confidentiality.

Conducting the Interview

Interviews were conducted using computer-assisted telephone interviewing (CATI) which minimizes potential for interviewer errors by controlling progression through the questionnaire and preventing out-of-range responses. If the adult household member with the most recent birthday was not available, a callback was scheduled. In the event of respondent refusals, the case was finalized if it was a hostile or second refusal from the household; no other household members were allowed to continue with the interview. The case management system allowed for "blended" inbound dialing, which provides interviewers the ability to make outbound calls, while also receiving inbound calls to the study's toll-free line. At the end of each call, the interviewer was directed through a series of universal exit questions to establish the call disposition and set a callback time if necessary.

Refusal Conversion

Each interviewer was given a project-specific job-aid and a list of frequently asked questions (FAQs). The FAQs provided interviewers with example statements for generic refusal aversion and gaining respondent cooperation. If a case was coded a refusal and scheduled for a call back, an experienced refusal converter was assigned to the case. If a respondent contacted UMass Amherst or the IRB office at NORC at any point during data collection to refuse to participate in the study, the case was finalized in the case management system. These cases would no longer receive mailings or be dialed in CATI.

Additional Sample Release

Because of a lower number of SAQ returns, NORC released additional sample and extended the data collection timeline. The first two batches released included 30,740 sample cases; batch 3 included 16,500 sample cases. Batch 3 followed the same mailing procedure as previous batches except households were not mailed SAQ

[14] The base address sample was from the Vericast vendor, with demographic variables appended by Merkle.

packets and proceeded with CATI after the initial web reminder postcard was sent. There were no changes to the materials that were mailed to Batch 3. Figure 16 shows the data collection schedule for Batch 3.

Figure 16. Data Collection Schedule for Batch 3

Respondent Contact	2/21	2/28	3/7	3/14	3/21	3/28
Web Letter 1						
Web Reminder Postcard						
Web Letter 2						
Web Reminder Postcard						
Telephone Interviewing						

Data Preparation

Data Editing and Cleaning

NORC implemented a series of data editing and cleaning procedures in order to provide UMass Amherst with the most accurate and comprehensive data files. Throughout data collection, SAS programs were run to identify any errors that occurred in the web or CATI systems. This allowed NORC to reconcile inconsistencies in the data and fix system or questionnaire errors as they occurred, minimizing additional data cleaning required at the end of data collection. NORC also worked alongside UMass Amherst to establish a series of data cleaning procedures for the raw data. As mentioned previously, questionnaires were sent to DSI for data entry. DSI was directed to enter responses as written without altering any information provided. Then if necessary, NORC would run data cleaning steps based on the procedures established.

NORC maintained an Access database to aid in the data delivery process. The database included a table, which listed all variables to be included in the final datasets. Data cleaning procedures that applied to a large number of cases were listed in the Global Cleaning table while procedures that applied to individual cases were listed in a separate table for case-specific edits. In addition to the Access database, SAS programs were written for extensive data cleaning procedures that could not fit within the parameters of the Access tables.

When responding to the survey, respondents were allowed to skip questions in the web while telephone interviewers had the option to select “Don’t Know” and “Refused.” To maintain consistency across modes, questions in the SAQ that should have been answered based on other responses but instead were left blank, were identified during the data cleaning process and assigned the skip code used in web.

Derived Variables

Several derived variables were created for the final datasets in order to provide additional descriptive information for each household. There were three additional derived variables created for the targeted population surveys at the request of UMass Amherst. For example, a derived variable was created to indicate if a respondent was active in each mode – web, phone, and mail. These variables were created to improve the weight estimates. SAS programs were written utilizing data from existing variables to create the derived variables.

Appendix B3: Sample Implementation and Response Rate[15]

Sample Implementation

We used a stratified address-based-sample (ABS) to draw a representative sample of the population of Massachusetts, with oversamples of African Americans, Asians, Hispanics or Latinos, and young adults. Initially we targeted 8,000 completed interviews across Massachusetts. Based on the oversampling strategies we anticipated at least 1,000 Asian non-Hispanic or Latino, and 1,000 African-American non-Hispanic or Latino completes. We projected 1,120 Hispanic or Latino completes and 1,400 young adults aged 18-29 years old completes, regardless of race/ethnicity. Some of our key demographic groups, particularly African Americans and Asians, are comparatively rare in the state, representing 9% and 6% of the population respectively. Consequently, targeting such households required precise methods. The use of predictive modeling based on "big data" coupled with tract-level demographic distributions from ACS helped to maximize the number of interviews we could complete in each group given the available budget.

First, we drew a systematic, random sample of 160,000 addresses in Massachusetts from a version of the USPS computerized delivery sequence file (CDSF). Then we matched these addresses to a 3rd party database to append useful auxiliary data elements. Then we applied four predictive models, corresponding to the four demographic groups that we are targeting (Asian non-Hispanic or Latino, Hispanic or Latino, African-American non-Hispanic or Latino, and young adults 18-29 years of age), to ascertain the likelihood that each household contains adults in the demographic groups. These models have been built on NORC's Amerispeak probability panel frame and tested in numerous real-world applications to establish accurate incidence and coverage rates.

A sample design using seven strata was realized by cross-classifying the modeled young adult indicator with the modeled race/ethnicity indicators. Ultimately, our modeling provides frame sizes as shown in the "frame count" column of Table 32. We drew an appropriate number of addresses in each strata to result in the target completes shown in Table 33 according to initial response rate assumptions. Note that only a percentage of the completes in a given stratum actually belong to the demographic group. This happens because of differential response rates across groups and because of imprecision of targeting. These response characteristics were considered at the outset and the required sample sizes reflected the imprecision. Therefore, a "Nominal Target Complete" refers to a complete in its sampled stratum, whereas an "Effective Complete" represents a complete that actually identifies as belonging to the stratum.

The design and numbers described were based on assumptions about the incidence rates of the modeled groups (e.g., the percentage of addresses identified as African American through the model that actually contain an African American), and response rates generally. Importantly, a batched sample release design was implemented in order to make adaptive sample design changes throughout fielding to accommodate for mis-specified response rate and incidence models.

[15] From NORC Methodology Report

Table 32. Stratified Design of FGPS Sample

Stratum	Frame Count*	Batch 1 Sample Size	Batch 2 Sample Size	Batch 3 Sample Size	Total Sample Size	Original Target Completes	Final Completes	Yield (Unweighted)	RR3 (Unweighted)
Other General Population (No model incidence)	130,568	6,600	4,003	-	10,603	2,337	2,305	21.7%	29.9%
African-American, no young adult	7,116	4,217	2,886	6,000	13,103	2,040	1,176	9.0%	13.6%
Asian, no young adult	5,020	1,619	735	3,147	5,501	783	983	17.9%	19.8%
Hispanic or Latino, no young adult	11,519	2,743	2,524	7,000	12,267	1,326	1,093	8.9%	11.9%
African-American, young adult	1,306	586	719	-	1,305	282	154	11.8%	19.9%
Asian, young adult	1,538	920	265	353	1,538	445	264	17.2%	25.2%
Hispanic or Latino, young adult	2,933	1,753	1,170	-	2,923	851	318	10.9%	19.4%
Total	160,000	18,438	12,302	16,500	47,240	8,064	6,293	13.3%	18.4%

* The frame count includes only the CDSF sample that was sent to the third party for the auxiliary data elements.

Table 33. Target Completes by Demographic Group

Stratum (Collapsed)	Target Effective Completes (Completes Actually in the Demographic Group)	Achieved Effective Completes (Completes Actually in the Demographic Group)
African-American	1,000	636
Asian	1,000	919
Hispanic or Latino	1,120	855
***Young Adult (18 – 29 years old)**	1,400	1,540
Other General Population (No model incidence)	Remaining	3,031
Total	~8,000	6,293

*Note that the young adult category is not mutually exclusive with race/ethnicity and so these respondents will sometimes belong to other demographic groups as well.

Several weeks after the first batch was released it became clear that response rates for the African American and Hispanic or Latino groups were over-estimated in the initial model. Subsequent sample batches helped to increase the number of completed interviews in these groups through extensive oversampling. The second batch drew exclusively on previously unreleased sample from the first batch, oversampling to the degree that appropriate cases were available on the frame. Even with these mid-field adjustments and changes to data collection protocols, and because the original sampling frame did not contain a sufficient number of unreleased sample in the necessary strata after the second batch, a final third batch was still required to gain sufficient numbers of completes in the African-American and Hispanic or Latino strata.

After a reformulation of the response targets given the propensity for response from these groups, and in light of the available budget, a third batch was drawn primarily from a new sample that was created

from predominantly African American and Hispanic or Latino Census tracts and based on predictive modeling (Table 34). A small amount of sample was drawn from previously unreleased sample in the demographic strata of interest. On balance, sample counts that were originally allocated to the Asian strata were shifted to the strata with lower response rates because doing so would still afford precise estimates of problem gambling for Asians, while also improving precision for African Americans and Hispanics or Latinos. Notably, the response from young adults and the general population was satisfactory from the beginning of fielding.

Table 34. Sample Size by Stratum Within Batch

Batch	STRATA_NAME	Descriptive Stratum Name	Sample Size	Relative percentage within batch
1	DSF_AfAm_incidence_no_young_adult	African-American, Not Young Adult	4217	23%
1	DSF_AfAm_incidence_young_adult	African-American, Young Adult	586	3%
1	DSF_Asian_incidence_no_young_adult	Asian, Not Young Adult	1619	9%
1	DSF_Asian_incidence_young_adult	Asian, Young Adult	920	5%
1	DSF_Latino_incidence_no_young_adult	Hispanic or Latino, Not Young Adult	2743	15%
1	DSF_Latino_incidence_young_adult	Hispanic or Latino, Young Adult	1753	10%
1	DSF_No_model_incidence	Other General Population	6600	36%
2	DSF_AfAm_incidence_no_young_adult	African-American, Not Young Adult	2886	23%
2	DSF_AfAm_incidence_young_adult	African-American, Young Adult	719	6%
2	DSF_Asian_incidence_no_young_adult	Asian, Not Young Adult	735	6%
2	DSF_Asian_incidence_young_adult	Asian, Young Adult	265	2%
2	DSF_Latino_incidence_no_young_adult	Hispanic or Latino, Not Young Adult	2524	21%
2	DSF_Latino_incidence_young_adult	Hispanic or Latino, Young Adult	1170	10%
2	DSF_No_model_incidence	Other General Population	4003	33%
3	DSF_AfAm_incidence_no_young_adult	African-American, Not Young Adult	6000	36%
3	DSF_Asian_incidence_no_young_adult	Asian, Not Young Adult	3147	19%
3	DSF_Asian_incidence_young_adult	Asian, Young Adult	353	2%
3	DSF_Latino_incidence_no_young_adult	Hispanic or Latino, Not Young Adult	7000	42%

Once data collection was complete, dispositions were assigned to each sampled case. Unweighted and weighted AAPOR style response rates were then calculated. The unweighted RR3 based on raw sample counts of the dispositions was 18.4%. The base weight RR3 was 27.5%. The 50% increase in the rate is not surprising when considering the oversampling of the demographic groups with lower response-propensity. An evaluation of the unweighted sample yield and RR3 shows that the General Population and Asian strata performed the best. And generally, the younger strata did not perform as well as the older strata, although the effect is less pronounced for yield than for RR3. The Hispanic or Latino and African-American strata were similar in their rates when evaluating within the age group. For reporting either yield or RR3 can be used to compare relative performance across the strata. When evaluating overall study performance, the weighted RR3 may be most appropriate.

The base weights were constructed according to the probability of selection to be in the sample (Table 35). These probabilities were informed by the sample release batch as well as the sampling stratum. Each sampled case is then assigned a base weight defined as the reciprocal of their probability of

selection. Note that as the sample design was adjusted mid-fielding to account for differential non-response across the strata, batch 3 base weights are different from those of batches 1 and 2 which only varied by stratum.

Table 35. Base Weights by Batch and Stratum

Batch	STRATA_NAME	Base Weight
1 and 2	DSF_No_model_incidence	221.91
1 and 2	DSF_AfAm_incidence_no_young_adult	18.05
1 and 2	DSF_Asian_incidence_no_young_adult	19.35
1 and 2	DSF_Latino_incidence_no_young_adult	39.41
1 and 2	DSF_AfAm_incidence_young_adult	18.03
1 and 2	DSF_Asian_incidence_young_adult	18.02
1 and 2	DSF_Latino_incidence_young_adult	18.08
3	DSF_AfAm_incidence_no_young_adult	5.82
3	DSF_Latino_incidence_no_young_adult	4.99
3	DSF_Asian_incidence_no_young_adult	6.79
3	DSF_Asian_incidence_young_adult	18.02

Appendix B4: Data Weighting Procedures

Follow-up population survey data were provided to the SEIGMA Research Team with statistical weights. The weights accounted for the probability of a household being selected. The Baseline General Population Survey (BGPS), conducted in 2013 and 2014, was designed to select a stratified sample of dwelling units that would yield 2,5000 adult respondents from Western Massachusetts and 7,500 adult respondents in Eastern Massachusetts (the remainder of the state). The Follow-up General Population Survey (FGPS), conducted in 2021 and 2022, was designed with targets of 1,000 established for Asian non-Hispanics or Latinos, 1,000 for African American non-Hispanics or Latinos, 1,120 Hispanics or Latinos and 1,400 young adults aged 18-29 years old, regardless of their race ethnicity. Although the FGPS sample was stratified by race/ethnicity and age rather than region, we used similar weighting techniques that were used for the Baseline General Population Survey (BGPS).

Summary of Weighting Procedures

Data from the survey were weighted to account for the stratified survey design (wt1), differential screening rates associated with address characteristics (wt2), and response completion rates (wt3). Inverse probability sampling weights were used to account for the survey design (wt1). This weighting process was completed by NORC and confirmed by the SEIGMA Research Team. Addresses were grouped by variables available in the frame, based on variables used for the FGPS weighting. Two frame variables (race/ethnicity and age) were selected as stratification variables to weight the data for differential screening rates. These weights were applied to all sample addresses, such that the sum of the weights totaled to the number of addresses in the population frame (wt2). A third adjustment was made for completion rates. Weights were adjusted by batch, stratum, language and mode of interview. Completion rates were evaluated for a cross-classification of these variables, and used to adjust the screening adjusted weights (wt3).

Three additional steps were taken to create the weights. First, weights were added to account for the number of 18+ household members (wt4). Next, 2021 Census estimates of the MA 18+ population from PUMS data were used to form 6 raking variables. An iterative raking process was used until marginal weights converged to PUMS totals (wt5). Finally, the impact of trimming the weight range was evaluated based on the accuracy of estimates of key variables. Weights were trimmed so that the minimum weight was 1/8th the average weight, and the maximum weight was 8 times the average weight (wt6).

Weighting Scheme for the FGPS

As summarized above, the weighting scheme involved the following steps:

1. Base sampling weight;
2. Adjustment for unknown eligibility;
3. Adjustment for non-response to the questionnaire;
4. Accounting for number of persons 18+ in the household (with the number of 18+ household members truncated to a maximum of 4);
5. Adjusting weights using raking based on cross-classified pairs of the variables region, age, gender, race/ethnicity, education;
6. Trimming of weights by setting the minimum weight to be the average weight divided by 8, and the maximum weight to be the average weight times 8.

Each individual weighting step is discussed in detail below.

Step 1. Base Sampling Weight

The base weight reflected the probability of a household being selected and was equal to the inverse of the probability of selection (π):

$$WT1 = \frac{1}{\pi}$$

where $\pi = \frac{\text{sampled addresses}}{\text{addresses in Frame}}$.

The base weights were constructed according to the probability of selection to be in the sample. These probabilities were informed by the sample release batch as well as the sampling stratum. Each sampled case was then assigned a base weight defined as the reciprocal of their probability of selection. Note that because the sample design was adjusted mid-fielding to account for differential non-response across the strata, Batch 3 base weights are different from those of Batches 1 and 2 which only varied by stratum, shown in Table 36.

Table 36. Design weights by Batch and Stratum for SEIGMA Follow-up General Population Survey

Batch	STRATA_NAME	# Pop Addresses: POP	# Sampled Addresses: SAMP	Design Wt: WT1
Batch 1-2	DSF_AfAm_incidence_no_young_adult	128,237	7,103	18.05
Batch 1-2	DSF_AfAm_incidence_young_adult	23,535	1,305	18.03
Batch 1-2	DSF_Asian_incidence_no_young_adult	45,546	2,354	19.35
Batch 1-2	DSF_Asian_incidence_young_adult	21,355	1,185	18.02
Batch 1-2	DSF_Latino_incidence_no_young_adult	207,583	5,267	39.41
Batch 1-2	DSF_Latino_incidence_young_adult	52,855	2,923	18.08
Batch 1-2	DSF_No_model_incidence	2,352,950	10,603	221.91
Batch 3	DSF_AfAm_incidence_no_young_adult	34,913	6,000	5.82
Batch 3	DSF_Asian_incidence_no_young_adult	50,429	3,147	16.02
Batch 3	DSF_Asian_incidence_young_adult	6,361	353	18.02
Batch 3	DSF_Latino_incidence_no_young_adult	34,913	7,000	4.99
		2,958,678	**47,240**	

The design weight is the variable WT1 in the follow-up survey dataset. The design weight was assigned to all sampled addresses.

Step 2. Adjustment for Screening

The first adjustment to the weight was to account for those addresses that were unable to be contacted or sufficiently screened and thus had an unknown eligibility status. We note that the 'screened' addresses were classified as 'eligible' or 'in-eligible' addresses. In this adjustment, the weight assigned to addresses that were screened was adjusted to account for addresses not screened. This assumes that the proportion of 'un-screened' addresses that are 'eligible' is equal to the proportion among the 'screened' addresses.

Adjustments were made for different strata using variables that were available for all sampled addresses. For the BGPS, region, address type (PO box, single family dwelling, or multiple family dwelling), and language (English or Spanish based on census demographic information from adjacent areas) were used to stratify sample addresses. For FGPS, we used batch and stratum (in place of region), address type and language.

These variables were used to stratify the n=33,368 sample addresses (see Table 37). Seven strata did not have any samples screened.

Table 37. Screening Rates by Batch, Stratum, Address type and Language

Batch	STRATA_NAME	Type of Address: ADDTYP	Language: LANGSP	# Sampled Addresses: SCR_N	# Screened Addresses: SCR_T	% Screened: SCR_P	Screen Adjusted Wt: WT2	# Completed: COMP
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=SFDU-SFam	0=Non-Span	2,417	345	14.3%	126.48	336
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=SFDU-SFam	1=Spanish	212	18	8.49%	212.63	18
Batch 1-2	DSF_AfAm_incidence_no_young_adult	2=MFDU-MFam	0=Non-Span	3,996	441	11.0%	163.59	425
Batch 1-2	DSF_AfAm_incidence_no_young_adult	2=MFDU-MFam	1=Spanish	464	34	7.33%	246.38	31
Batch 1-2	DSF_AfAm_incidence_no_young_adult	9=PO Box	0=Non-Span	14	3	21.4%	84.25	3
Batch 1-2	DSF_AfAm_incidence_young_adult	1=SFDU-SFam	0=Non-Span	275	44	16.0%	112.72	43
Batch 1-2	DSF_AfAm_incidence_young_adult	1=SFDU-SFam	1=Spanish	80	5	6.25%	288.56	4
Batch 1-2	DSF_AfAm_incidence_young_adult	2=MFDU-MFam	0=Non-Span	797	98	12.3%	146.67	94
Batch 1-2	DSF_AfAm_incidence_young_adult	2=MFDU-MFam	1=Spanish	152	13	8.55%	210.87	13
Batch 1-2	DSF_AfAm_incidence_young_adult	9=PO Box	0=Non-Span	1	0	0.00%	.	0
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=SFDU-SFam	0=Non-Span	1,454	386	26.5%	72.88	376
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=SFDU-SFam	1=Spanish	21	2	9.52%	203.16	2
Batch 1-2	DSF_Asian_incidence_no_young_adult	2=MFDU-MFam	0=Non-Span	860	164	19.1%	101.46	161
Batch 1-2	DSF_Asian_incidence_no_young_adult	2=MFDU-MFam	1=Spanish	19	0	0.00%	.	0
Batch 1-2	DSF_Asian_incidence_young_adult	1=SFDU-SFam	0=Non-Span	285	57	20.0%	90.10	56
Batch 1-2	DSF_Asian_incidence_young_adult	1=SFDU-SFam	1=Spanish	8	2	25.0%	72.08	2
Batch 1-2	DSF_Asian_incidence_young_adult	2=MFDU-MFam	0=Non-Span	874	173	19.8%	91.04	170
Batch 1-2	DSF_Asian_incidence_young_adult	2=MFDU-MFam	1=Spanish	18	2	11.1%	162.19	2
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=SFDU-SFam	0=Non-Span	1,011	188	18.6%	211.94	187
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=SFDU-SFam	1=Spanish	1,566	206	13.2%	299.61	201
Batch 1-2	DSF_Latino_incidence_no_young_adult	2=MFDU-MFam	0=Non-Span	859	113	13.2%	299.60	109
Batch 1-2	DSF_Latino_incidence_no_young_adult	2=MFDU-MFam	1=Spanish	1,816	171	9.42%	418.55	167
Batch 1-2	DSF_Latino_incidence_no_young_adult	9=PO Box	0=Non-Span	11	4	36.4%	108.38	4
Batch 1-2	DSF_Latino_incidence_no_young_adult	9=PO Box	1=Spanish	4	1	25.0%	157.65	1
Batch 1-2	DSF_Latino_incidence_young_adult	1=SFDU-SFam	0=Non-Span	345	62	18.0%	100.62	61
Batch 1-2	DSF_Latino_incidence_young_adult	1=SFDU-SFam	1=Spanish	725	80	11.0%	163.87	78
Batch 1-2	DSF_Latino_incidence_young_adult	2=MFDU-MFam	0=Non-Span	666	78	11.7%	154.40	76
Batch 1-2	DSF_Latino_incidence_young_adult	2=MFDU-MFam	1=Spanish	1,184	107	9.04%	200.09	102
Batch 1-2	DSF_Latino_incidence_young_adult	9=PO Box	0=Non-Span	1	1	100%	18.08	1
Batch 1-2	DSF_Latino_incidence_young_adult	9=PO Box	1=Spanish	2	0	0.00%	.	0
Batch 1-2	DSF_No_model_incidence	1=SFDU-SFam	0=Non-Span	6,738	1,722	25.6%	868.32	1,681

Batch	STRATA_NAME	Type of Address: ADDTYP	Language: LANGSP	# Sampled Addresses: SCR_N	# Screened Addresses: SCR_T	% Screened: SCR_P	Screen Adjusted Wt: WT2	# Completed: COMP
Batch 1-2	DSF_No_model_incidence	1=SFDU-SFam	1=Spanish	128	17	13.3%	1670.9	15
Batch 1-2	DSF_No_model_incidence	2=MFDU-MFam	0=Non-Span	3,489	588	16.9%	1316.8	566
Batch 1-2	DSF_No_model_incidence	2=MFDU-MFam	1=Spanish	72	9	12.5%	1775.3	9
Batch 1-2	DSF_No_model_incidence	9=PO Box	0=Non-Span	175	36	20.6%	1078.7	34
Batch 1-2	DSF_No_model_incidence	9=PO Box	1=Spanish	1	0	0.00%	.	0
Batch 3	DSF_AfAm_incidence_no_young_adult	1=SFDU-SFam	0=Non-Span	2,175	166	7.63%	76.24	156
Batch 3	DSF_AfAm_incidence_no_young_adult	2=MFDU-MFam	0=Non-Span	3,825	214	5.59%	104.01	207
Batch 3	DSF_Asian_incidence_no_young_adult	1=SFDU-SFam	0=Non-Span	460	57	12.4%	54.56	55
Batch 3	DSF_Asian_incidence_no_young_adult	1=SFDU-SFam	0=Non-Span	1,442	244	16.9%	114.35	232
Batch 3	DSF_Asian_incidence_no_young_adult	1=SFDU-SFam	1=Spanish	1	0	0.00%	.	0
Batch 3	DSF_Asian_incidence_no_young_adult	1=SFDU-SFam	1=Spanish	16	3	18.8%	103.19	3
Batch 3	DSF_Asian_incidence_no_young_adult	2=MFDU-MFam	0=Non-Span	367	40	10.9%	62.03	40
Batch 3	DSF_Asian_incidence_no_young_adult	2=MFDU-MFam	0=Non-Span	838	118	14.1%	137.41	111
Batch 3	DSF_Asian_incidence_no_young_adult	2=MFDU-MFam	1=Spanish	3	1	33.3%	20.28	1
Batch 3	DSF_Asian_incidence_no_young_adult	2=MFDU-MFam	1=Spanish	20	4	20.0%	96.74	2
Batch 3	DSF_Asian_incidence_young_adult	1=SFDU-SFam	0=Non-Span	88	8	9.09%	198.23	8
Batch 3	DSF_Asian_incidence_young_adult	1=SFDU-SFam	1=Spanish	1	0	0.00%	.	0
Batch 3	DSF_Asian_incidence_young_adult	2=MFDU-MFam	0=Non-Span	259	28	10.8%	166.69	26
Batch 3	DSF_Asian_incidence_young_adult	2=MFDU-MFam	1=Spanish	5	0	0.00%	.	0
Batch 3	DSF_Latino_incidence_no_young_adult	1=SFDU-SFam	0=Non-Span	1,867	156	8.36%	59.69	147
Batch 3	DSF_Latino_incidence_no_young_adult	1=SFDU-SFam	1=Spanish	631	28	4.44%	112.40	28
Batch 3	DSF_Latino_incidence_no_young_adult	2=MFDU-MFam	0=Non-Span	3,483	219	6.29%	79.32	210
Batch 3	DSF_Latino_incidence_no_young_adult	2=MFDU-MFam	1=Spanish	1,019	42	4.12%	121.01	39
				47,240	**6,498**			**6,293**

The screening rate ranged from 4.1% (among Adult Latino multiple family addresses in Spanish speaking areas) to 36.4% (among Adult Latino PO Box addresses in non-Spanish speaking areas). The screen adjusted weight is the variable WT2 in the follow-up survey dataset, given by dividing the design weight (WT1) by the proportion of screened addresses (SCR_P),

$$WT2 = \frac{WT1}{SCR_P} \ .$$

This weight was assigned to all screened addresses. Addresses that were not screened were dropped from the remaining weighting steps.

Step 3. Adjustment for Completion Status at an Address

The next adjustment accounted for differences in the rate of completed interviews by characteristics of the address, including the final mode of the interview. Before making this adjustment, 3 addresses were dropped because it was determined that the addresses did not have any eligible respondents (based on a telephone interview). As a result, adjustments were made to 47,237 addresses.

A complete response was not obtained from all screened addresses. For addresses with a complete response, the non-response adjusted weight accounted for other screened addresses without a complete response. The process used to determine the adjustment strata was similar to the process in Step 2. For the BGPS analyses, the three variables most strongly related to completion rates were region, language (English or Spanish based on census demographic information from adjacent areas), and mode of interview (Web, SAQ, and CATI). For FGPS, we used batch and stratum (in place of region), language and mode of interview. These variables were used to stratify the n=6,495 screened sample addresses (see Table 38).

Using the completion rate in each stratum, the completion adjusted weight was evaluated as

$$WT3 = \frac{WT2}{COMP_P} .$$

The complete response adjusted weight is the variable WT3 in the follow-up survey dataset. This weight was assigned to all addresses with a complete response. Addresses where a response was not completed were dropped from the remaining weighting steps.

Table 38. Description of Completion Adjustment Factor For Address Weights from NORC

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	# of Screened Addresses: SCR_N	# Addresses with Completed Interview: COMP_N	% Complete: COMP_P	Screen Adjusted Wt: WT2	Completion Adjusted Wt: WT3
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	185	185	100.0%	126.48	126.48
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	218	218	100.0%	163.59	163.59
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	9=PO Box	1	1	100.0%	84.25	84.25
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	110	108	97.79%	126.48	129.33
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	160	156	97.79%	163.59	167.28
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	9=PO Box	2	2	97.79%	84.25	86.15
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	49	43	83.93%	126.48	150.70
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	63	51	83.93%	163.59	194.92
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	12	12	100.0%	212.63	212.63
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	10	10	100.0%	246.38	246.38
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	5	5	95.45%	212.63	222.76
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	SAQ	2=MFDU-MFam	17	16	95.45%	246.38	258.11
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	1	1	75.00%	212.63	283.51
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	7	5	75.00%	246.38	328.51
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	23	23	100.0%	112.72	112.72
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	60	60	100.0%	146.67	146.67
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	16	16	95.83%	112.72	117.62
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	32	30	95.83%	146.67	153.05
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	5	4	72.73%	112.72	154.99
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	6	4	72.73%	146.67	201.67
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	3	3	100.0%	288.56	288.56
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	10	10	100.0%	210.87	210.87
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	1	0	66.67%	288.56	432.83
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	SAQ	2=MFDU-MFam	2	2	66.67%	210.87	316.30
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	CATI	1=SFDU-SFam	1	1	100.0%	288.56	288.56
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	CATI	2=MFDU-MFam	1	1	100.0%	210.87	210.87
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	228	228	100.0%	72.88	72.88
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	96	96	100.0%	101.46	101.46
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	131	126	97.34%	72.88	74.87
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	57	57	97.34%	101.46	104.23
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	27	22	78.95%	72.88	92.32
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	11	8	78.95%	101.46	128.52
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	1	1	100.0%	203.16	203.16
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	1	1	100.0%	203.16	203.16
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	35	35	99.32%	90.10	90.72
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	113	112	99.32%	91.04	91.66
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	19	18	97.10%	90.10	92.79
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	50	49	97.10%	91.04	93.76
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	3	3	92.31%	90.10	97.61

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	# of Screened Addresses: SCR_N	# Addresses with Completed Interview: COMP_N	% Complete: COMP_P	Screen Adjusted Wt: WT2	Completion Adjusted Wt: WT3
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	10	9	92.31%	91.04	98.63
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	1	1	100.0%	72.08	72.08
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	2	2	100.0%	162.19	162.19
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	1	1	100.0%	72.08	72.08
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	97	97	99.34%	211.94	213.36
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	52	51	99.34%	299.60	301.60
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	9=PO Box	2	2	99.34%	108.38	109.11
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	75	75	100.0%	211.94	211.94
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	42	42	100.0%	299.60	299.60
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	9=PO Box	2	2	100.0%	108.38	108.38
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	16	15	88.57%	211.94	239.29
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	19	16	88.57%	299.60	338.26
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	109	109	100.0%	299.61	299.61
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	80	80	100.0%	418.55	418.55
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	73	72	97.10%	299.61	308.55
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	2=MFDU-MFam	64	61	97.10%	418.55	431.04
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	9=PO Box	1	1	97.10%	157.65	162.35
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	24	20	90.20%	299.61	332.17
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	27	26	90.20%	418.55	464.04
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	37	37	100.0%	100.62	100.62
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	51	51	100.0%	154.40	154.40
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	14	14	97.22%	100.62	103.50
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	21	20	97.22%	154.40	158.81
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	9=PO Box	1	1	97.22%	18.08	18.60
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	11	10	88.24%	100.62	114.04
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	6	5	88.24%	154.40	174.98
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	49	49	100.0%	163.87	163.87
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	60	60	100.0%	200.09	200.09
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	23	21	95.31%	163.87	171.93
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	SAQ	2=MFDU-MFam	41	40	95.31%	200.09	209.93
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	CATI	1=SFDU-SFam	8	8	71.43%	163.87	229.42
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	CATI	2=MFDU-MFam	6	2	71.43%	200.09	280.13
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	1=SFDU-SFam	944	943	99.92%	868.32	869.00
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	2=MFDU-MFam	323	323	99.92%	1316.8	1317.8
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	9=PO Box	17	17	99.92%	1078.7	1079.6
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	1=SFDU-SFam	586	575	97.54%	868.32	890.25
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	2=MFDU-MFam	207	200	97.54%	1316.8	1350.0
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	9=PO Box	19	17	97.54%	1078.7	1106.0
Batch 1-2	DSF_No_model_incidence	0=Non-Span	CATI	1=SFDU-SFam	192	163	83.06%	868.32	1045.4
Batch 1-2	DSF_No_model_incidence	0=Non-Span	CATI	2=MFDU-MFam	56	43	83.06%	1316.8	1585.2
Batch 1-2	DSF_No_model_incidence	1=Spanish	Web	1=SFDU-SFam	7	7	100.0%	1670.9	1670.9

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	# of Screened Addresses: SCR_N	# Addresses with Completed Interview: COMP_N	% Complete: COMP_P	Screen Adjusted Wt: WT2	Completion Adjusted Wt: WT3
Batch 1-2	DSF_No_model_incidence	1=Spanish	Web	2=MFDU-MFam	6	6	100.0%	1775.3	1775.3
Batch 1-2	DSF_No_model_incidence	1=Spanish	SAQ	1=SFDU-SFam	7	7	100.0%	1670.9	1670.9
Batch 1-2	DSF_No_model_incidence	1=Spanish	SAQ	2=MFDU-MFam	2	2	100.0%	1775.3	1775.3
Batch 1-2	DSF_No_model_incidence	1=Spanish	CATI	1=SFDU-SFam	3	1	50.00%	1670.9	3341.8
Batch 1-2	DSF_No_model_incidence	1=Spanish	CATI	2=MFDU-MFam	1	1	50.00%	1775.3	3550.6
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	143	142	99.09%	76.24	76.94
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	187	185	99.09%	104.01	104.96
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	23	14	72.00%	76.24	105.89
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	27	22	72.00%	104.01	144.45
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	248	241	97.93%	114.35	116.77
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	138	137	97.93%	137.41	140.31
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	53	46	82.19%	113.22	137.75
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	20	14	82.19%	137.41	167.18
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	2	2	100.0%	103.19	103.19
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	2	2	100.0%	96.74	96.74
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	1	1	50.00%	103.19	206.38
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	3	1	50.00%	96.74	193.48
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	8	8	100.0%	198.23	198.23
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	19	19	100.0%	166.69	166.69
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	9	7	77.78%	166.69	214.32
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	150	146	98.04%	59.69	60.89
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	207	204	98.04%	79.32	80.91
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	6	1	38.89%	59.69	153.49
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	12	6	38.89%	79.32	203.97
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	27	27	98.48%	112.40	114.13
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	39	38	98.48%	121.01	122.87
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	1	1	50.00%	112.40	224.80
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	3	1	50.00%	121.01	242.02
					6495	**6293**			

Step 4. Adjustment for Household Size

The number of persons 18 years or older was reported by respondents for some of the addresses, depending upon whether the respondent completed the questionnaire on the Web, via a SAQ, or via a telephone interview. The number of 18+ persons in a household was not recorded as part of the SAQ, in most cases, so this value is missing for those respondents who completed the survey in this mode. The number of 18+ household members was not reported for 1,678 (26.7%) of the respondents. The distribution of the number of household members 18+ is given in Table 39.

Table 39. Number of 18+ Household Members

d1_R RECODED: How many members of your household, including yourself, are 18 years of age or older?				
d1_R	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
.	1465	.	.	.
R	213	.	.	.
1	1191	25.81	1191	25.81
2	2287	49.56	3478	75.36
3	683	14.80	4161	90.16
4	335	7.26	4496	97.42
5	84	1.82	4580	99.24
6	22	0.48	4602	99.72
7	7	0.15	4609	99.87
8	1	0.02	4610	99.89
9	1	0.02	4611	99.91
10	4	0.09	4615	100.00
Frequency Missing = 1678				

For the BGPS, based on discussions with NORC, a decision was made to classify household size as 4 when the number of 18+ persons in a household was reported to be greater than or equal to 4. This truncation was made to avoid assigning very large weights to any one respondent. The same was done for the FGPS and affected 118 respondents.

Table 40 below is organized in a similar manner to Table 38, but with the frequency of responses for various size households listed instead of the weights. The total number of respondents in Table 40 is 6,293 corresponding to the number of eligible respondents in the follow-up survey. In order to account for household size in the weighting, we multiply the weight (WT3) from Table 38 by the number of household members in a household (using a multiple of 4 for households with 4+ household members). The total weight for respondents with known household size is given in Table 41.

Table 40. Description of Household Size by other Address Characteristics

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	7	40	91	29	18
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	13	92	84	19	10
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	9=PO Box	.	.	.	1	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	78	6	17	2	5
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	116	13	20	6	1
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	9=PO Box	2	.	.	.	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	29	7	4	1	2
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	39	5	3	3	1
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	2	2	2	4	2
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	.	2	3	.	5
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	3	.	2	.	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	SAQ	2=MFDU-MFam	8	2	5	1	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	1	.	.	.	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	3	2	.	.	.
STRATA_NAME					**301**	**171**	**231**	**66**	**44**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	.	5	6	9	3
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	1	18	26	10	5
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	12	2	.	1	1
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	16	4	7	2	1
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	2	.	1	1	.
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	2	2	.	.	.
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	.	1	1	.	1
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	.	2	6	1	1
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	SAQ	2=MFDU-MFam	1	1	.	.	.
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	CATI	1=SFDU-SFam	1	.	.	.	.
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	CATI	2=MFDU-MFam	1	.	.	.	.
STRATA_NAME					**36**	**35**	**47**	**24**	**12**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	10	19	107	44	48
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	6	32	44	10	4
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	60	1	40	10	15
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	35	9	11	2	.
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	15	2	2	2	1
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	5	.	2	1	.
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	.	.	1	.	.
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	1	.	.	.	.

STRATA_NAME					132	63	207	69	68

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	4	6	18	4	3
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	6	32	56	12	6
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	8	.	2	4	4
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	21	10	16	2	.
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	2	1	.	.	.
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	3	3	2	.	1
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	.	.	1	.	.
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	.	.	2	.	.
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	1	.	.	.	.
STRATA_NAME					45	52	97	22	14

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	4	15	61	10	7
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	3	20	20	7	1
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	9=PO Box	.	1	1	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	56	1	12	4	2
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	27	7	5	3	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	9=PO Box	2	.	.	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	14	.	1	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	13	2	1	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	2	18	57	17	15
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	5	20	33	13	9
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	46	5	11	3	7
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	2=MFDU-MFam	46	5	9	1	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	9=PO Box	1	.	.	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	13	2	5	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	19	5	1	1	.
STRATA_NAME					251	101	217	59	41

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	.	4	25	5	3
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	2	21	21	6	1
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	9	.	2	3	.
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	8	4	4	4	.
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	9=PO Box	1	.	.	.	.
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	7	.	1	1	1
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	3	.	2	.	.
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	1	6	29	6	7
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	2	15	28	12	3

Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	15	1	4	.	1
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	SAQ	2=MFDU-MFam	25	6	7	2	.
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	CATI	1=SFDU-SFam	7	.	.	.	1
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	CATI	2=MFDU-MFam	2	.	.	.	.
STRATA_NAME					**82**	**57**	**123**	**39**	**17**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	1=SFDU-SFam	24	181	537	124	77
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	2=MFDU-MFam	19	133	135	23	13
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	9=PO Box	2	4	10	1	.
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	1=SFDU-SFam	392	26	117	24	16
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	2=MFDU-MFam	138	25	30	7	.
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	9=PO Box	16	1	.	.	.
Batch 1-2	DSF_No_model_incidence	0=Non-Span	CATI	1=SFDU-SFam	131	9	18	3	2
Batch 1-2	DSF_No_model_incidence	0=Non-Span	CATI	2=MFDU-MFam	33	5	5	.	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	Web	1=SFDU-SFam	.	1	4	.	2
Batch 1-2	DSF_No_model_incidence	1=Spanish	Web	2=MFDU-MFam	.	6	.	.	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	SAQ	1=SFDU-SFam	4	1	1	1	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	SAQ	2=MFDU-MFam	2	.	.	.	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	CATI	1=SFDU-SFam	.	1	.	.	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	CATI	2=MFDU-MFam	.	1	.	.	.
STRATA_NAME					**761**	**394**	**857**	**183**	**110**
Batch					**1,608**	**873**	**1,779**	**462**	**306**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	13	29	49	28	23
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	12	71	54	28	20
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	.	5	6	3	.
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	2	11	5	3	1
STRATA_NAME					**27**	**116**	**114**	**62**	**44**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	8	16	119	59	39
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	7	46	60	18	6
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	5	5	18	10	8
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	.	5	4	3	2
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	.	1	1	.	.
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	.	1	1	.	.
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	.	1	.	.	.
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	.	.	1	.	.
STRATA_NAME					**20**	**75**	**204**	**90**	**55**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	.	1	5	1	1
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	2	5	8	3	1
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	.	2	4	1	.
STRATA_NAME					**2**	**8**	**17**	**5**	**2**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	HH Size: 1	HH Size: 2	HH Size: 3	HH Size: 4+
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	8	33	66	20	19
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	8	68	78	30	20
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	.	.	.	.	1
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	1	3	2	.	.
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	1	2	10	8	6
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	3	12	16	6	1
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	.	.	1	.	.
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	.	1	.	.	.
STRATA_NAME					**21**	**119**	**173**	**64**	**47**
Batch					**70**	**318**	**508**	**221**	**148**
					1,678	**1,191**	**2,287**	**683**	**454**

Table 41. Description of Household Size by other Address Characteristics

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	7	5,059	23,020	11,004	9,107
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	13	15,050	27,483	9,325	6,544
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	9=PO Box	.	.	.	253	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	78	776	4,397	776	2,587
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	116	2,175	6,691	3,011	669
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	9=PO Box	2	.	.	.	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	29	1,055	1,206	452	1,206
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	39	975	1,169	1,754	780
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	2	425	851	2,552	1,701
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	.	493	1,478	.	4,928
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	3	.	891	.	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	SAQ	2=MFDU-MFam	8	516	2,581	774	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	1	.	.	.	.
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	3	657	.	.	.
STRATA_NAME					**301**	**27,181**	**69,768**	**29,901**	**27,520**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	.	564	1,353	3,043	1,353
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	1	2,640	7,627	4,400	2,933
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	12	235	.	353	470
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	16	612	2,143	918	612
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	2	.	310	465	.
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	2	403	.	.	.
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	.	289	577	.	1,154
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	.	422	2,530	633	843
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	.	.	.	.	.
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	SAQ	2=MFDU-MFam	1	316	.	.	.
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	CATI	1=SFDU-SFam	1	.	.	.	.
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	CATI	2=MFDU-MFam	1	.	.	.	.
STRATA_NAME					**36**	**5,481**	**14,540**	**9,812**	**7,366**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	10	1,385	15,597	9,620	13,993
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	6	3,247	8,929	3,044	1,623
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	60	75	5,990	2,246	4,492
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	35	938	2,293	625	.
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	15	185	369	554	369
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	5	.	514	386	.
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	.	.	406	.	.
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	1	.	.	.	.
STRATA_NAME					**132**	**5,829**	**34,098**	**16,475**	**20,478**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	4	544	3,266	1,089	1,089
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	6	2,933	10,266	3,300	2,200
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	8	.	371	1,114	1,485
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	21	938	3,000	563	.
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	2	98	.	.	.
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	3	296	395	.	395
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	.	.	144	.	.
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	.	.	649	.	.

Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	1	.	.	.	.
STRATA_NAME					**45**	**4,809**	**18,091**	**6,064**	**5,168**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	4	3,200	26,030	6,401	5,974
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	3	6,032	12,064	6,334	1,206
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	9=PO Box	.	109	218	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	56	212	5,087	2,543	1,696
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	27	2,097	2,996	2,696	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	9=PO Box	2	.	.	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	14	.	479	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	13	677	677	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	2	5,393	34,155	15,280	17,976
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	5	8,371	27,624	16,323	15,068
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	46	1,543	6,788	2,777	8,639
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	2=MFDU-MFam	46	2,155	7,759	1,293	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	9=PO Box	1	.	.	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	13	664	3,322	.	.
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	19	2,320	928	1,392	.
STRATA_NAME					**251**	**32,774**	**128,126**	**55,040**	**50,560**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	.	402	5,031	1,509	1,207
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	2	3,242	6,485	2,779	618
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	9	.	414	931	.
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	8	635	1,270	1,906	.
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	9=PO Box	1	.	.	.	.
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	7	.	228	342	456
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	3	.	700	.	.
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	1	983	9,505	2,950	4,588
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	2	3,001	11,205	7,203	2,401
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	15	172	1,375	.	688
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	SAQ	2=MFDU-MFam	25	1,260	2,939	1,260	.
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	CATI	1=SFDU-SFam	7	.	.	.	918
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	CATI	2=MFDU-MFam	2	.	.	.	.
STRATA_NAME					**82**	**9,696**	**39,152**	**18,880**	**10,876**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	1=SFDU-SFam	24	157,289	933,307	323,268	267,652
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	2=MFDU-MFam	19	175,266	355,803	90,927	68,525
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	9=PO Box	2	4,318	21,592	3,239	.
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	1=SFDU-SFam	392	23,147	208,319	64,098	56,976
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	2=MFDU-MFam	138	33,750	81,001	28,350	.
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	9=PO Box	16	1,106	.	.	.
Batch 1-2	DSF_No_model_incidence	0=Non-Span	CATI	1=SFDU-SFam	131	9,408	37,633	9,408	8,363
Batch 1-2	DSF_No_model_incidence	0=Non-Span	CATI	2=MFDU-MFam	33	7,926	15,852	.	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	Web	1=SFDU-SFam	.	1,671	13,367	.	13,367
Batch 1-2	DSF_No_model_incidence	1=Spanish	Web	2=MFDU-MFam	.	10,652	.	.	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	SAQ	1=SFDU-SFam	4	1,671	3,342	5,013	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	SAQ	2=MFDU-MFam	2	.	.	.	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	CATI	1=SFDU-SFam	.	3,342	.	.	.
Batch 1-2	DSF_No_model_incidence	1=Spanish	CATI	2=MFDU-MFam	.	3,551	.	.	.
STRATA_NAME					**761**	**433,097**	**1670216**	**524,304**	**414,883**
batch					**1,608**	**518,866**	**1973990**	**660,476**	**536,852**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	13	2,231	7,540	6,463	7,079
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	12	7,452	11,336	8,817	8,397
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	.	529	1,271	953	.
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	2	1,589	1,445	1,300	578
STRATA_NAME					**27**	**11,802**	**21,591**	**17,533**	**16,053**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	8	1,868	27,790	20,667	18,215
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	7	6,454	16,838	7,577	3,368
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	5	689	4,959	4,132	4,408
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	.	836	1,337	1,505	1,337
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	.	103	206	.	.
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	.	97	193	.	.
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	.	206	.	.	.
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	.	.	387	.	.
STRATA_NAME					**20**	**10,254**	**51,711**	**33,881**	**27,328**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	.	198	1,982	595	793
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	2	833	2,667	1,500	667
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	.	429	1,715	643	.
STRATA_NAME					**2**	**1,460**	**6,364**	**2,738**	**1,460**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Missing HH Size	Total Wt3 HH Size: 1	Total Wt3 HH Size: 2	Total Wt3 HH Size: 3	Total Wt3 HH Size: 4
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	8	2,009	8,037	3,653	4,627
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	8	5,502	12,622	7,282	6,473
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	.	.	.	.	614
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	1	612	816	.	.
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	1	228	2,283	2,739	2,739
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	3	1,474	3,932	2,212	491
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	.	.	450	.	.
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	.	242	.	.	.
STRATA_NAME					**21**	**10,068**	**28,139**	**15,886**	**14,945**
Batch					**70**	**33,584**	**107,805**	**70,038**	**59,786**
					1,678	**552,450**	**2,081,794**	**730,514**	**596,637**

In Table 42, the total weight assigned to respondents with known household size is shown by stratum in the last column. The total weight assigned to Black adults, 30 years or older is 221,347.94; 37,199.06 for Black adults, 18-29 years old; 200,055.20 for Asian adults, 30 years or older; 46,153.42 for Asian adults, 18-29 years old; 335,535.06 for Hispanic adults, 30 years or older; 78,604.97 for Latino adults, 18-29 years old; and 3,042,499.78 for the rest of the Massachusetts adults, aged 18 or older.

When household size is unknown, if we assume the household size is one for each household, the total weight (WT2) for Black adults, 30 years or older is 51,625.16; 5,535.87 for Black adults, 18-29 years old; 14,313.70 for Asian adults, 30 years or older; 4,520.72 for Asian adults, 18-29 years old; 81,512.32 for Hispanic adults, 30 years or older; 14,410.06 for Latino adults, 18-29 years old; and 800,518.64 for the rest of the Massachusetts adults, aged 18 or older.

We used these totals, along with the 2021 PUMS MA population data to determine the number of 18+ persons to be associated with respondents where household size is unknown. We took the difference between the 2021 PUMS MA population estimate for each stratum (PWT) and the total of WT3 among those with HH size (TWT5) and divide it by the total of WT3 among those with HH size unknown, assuming a household of 1 (TWT0) to calculate the average household size for those respondents missing HH size (D1_R1). As the table below (Table 43) shows, for Black adult 30+, (225,394 – 221,348)/51,625 = 0.66 is the average household size for those respondents missing HH size. For stratum with average HH size greater than 4, HH size was truncated to 4.

Table 42. Description of Total WT3 Assigned by Household Size, etc

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Total Wt3 if 1 in HH when missing: TWT0	twt5
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	885.37	48189.53
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	2126.67	58401.67
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	9=PO Box	.	252.75
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	10088.10	8536.09
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	19404.49	12546.01
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	SAQ	9=PO Box	172.30	0.00
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	4370.35	3918.24
Batch 1-2	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	7601.72	4677.98
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	425.27	5528.49
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	.	6898.70
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	668.28	891.04
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	SAQ	2=MFDU-MFam	2064.92	3871.72
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	283.51	0.00
Batch 1-2	DSF_AfAm_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	985.53	657.02
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	1000.23	23313.02
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	1259.52	36001.16
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	.	2753.15
Batch 3	DSF_AfAm_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	288.90	4911.37
STRATA_NAME					**51625.16**	**221347.94**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Total Wt3 if 1 in HH when missing: TWT0	twt5
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	.	6312.14
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	146.67	17600.39
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	1411.41	1058.56
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	2448.75	4285.31
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	309.97	774.93
Batch 1-2	DSF_AfAm_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	403.34	403.34
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	.	2019.89
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	.	4428.21
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	.	0.00
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	SAQ	2=MFDU-MFam	316.30	316.30
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	CATI	1=SFDU-SFam	288.56	0.00
Batch 1-2	DSF_AfAm_incidence_young_adult	1=Spanish	CATI	2=MFDU-MFam	210.87	0.00
STRATA_NAME					**5535.87**	**37199.06**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Total Wt3 if 1 in HH when missing: TWT0	twt5
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	728.82	40595.30
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	608.76	16842.48
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	4492.40	12803.34
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	3648.15	3856.62
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	1384.76	1477.08
Batch 1-2	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	642.58	899.62
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	.	406.31
Batch 1-2	DSF_Asian_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	203.16	0.00
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	934.12	68541.33
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	982.20	34236.61

Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	688.74	14188.03
Batch 3	DSF_Asian_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	.	5015.32
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	.	309.57
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	.	290.22
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	.	206.38
Batch 3	DSF_Asian_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	.	386.97
STRATA_NAME					**14313.70**	**200055.20**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Total Wt3 if 1 in HH when missing: TWT0	twt5
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	362.87	5987.35
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	549.97	18698.89
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	742.35	2969.41
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	1968.95	4500.46
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	195.23	97.61
Batch 1-2	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	295.89	1084.92
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	.	144.17
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	.	648.75
Batch 1-2	DSF_Asian_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	72.08	0.00
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	.	3568.13
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	333.39	5667.57
Batch 3	DSF_Asian_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	.	2786.16
STRATA_NAME					**4520.72**	**46153.42**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Total Wt3 if 1 in HH when missing: TWT0	twt5
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	853.43	41604.58
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	904.79	25635.80
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	9=PO Box	.	327.32
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	11868.85	9537.47
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	8089.21	7789.61
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	SAQ	9=PO Box	216.77	0.00
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	3350.08	478.58
Batch 1-2	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	4397.36	1353.03
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	599.21	72804.51
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	2092.75	67386.53
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	1=SFDU-SFam	14193.32	19747.23
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	2=MFDU-MFam	19828.02	11207.14
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	SAQ	9=PO Box	162.35	0.00
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	4318.25	3986.08
Batch 1-2	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	8816.84	4640.44
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	1=SFDU-SFam	487.08	18326.44
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	Web	2=MFDU-MFam	647.28	31878.47
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	1=SFDU-SFam	.	613.97
Batch 3	DSF_Latino_incidence_no_young_adult	0=Non-Span	CATI	2=MFDU-MFam	203.97	1427.82
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	1=SFDU-SFam	114.13	7988.99
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	Web	2=MFDU-MFam	368.61	8109.44
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	1=SFDU-SFam	.	449.60
Batch 3	DSF_Latino_incidence_no_young_adult	1=Spanish	CATI	2=MFDU-MFam	.	242.02
STRATA_NAME					**81512.32**	**335535.06**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Total Wt3 if 1 in HH	twt5

					when missing: TWT0	
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	Web	1=SFDU-SFam	.	8150.26
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	Web	2=MFDU-MFam	308.79	13123.75
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	1=SFDU-SFam	931.46	1345.44
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	2=MFDU-MFam	1270.47	3811.40
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	SAQ	9=PO Box	18.60	0.00
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	CATI	1=SFDU-SFam	798.26	1026.33
Batch 1-2	DSF_Latino_incidence_young_adult	0=Non-Span	CATI	2=MFDU-MFam	524.95	699.93
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	Web	1=SFDU-SFam	163.87	18026.03
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	Web	2=MFDU-MFam	400.18	23810.81
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	SAQ	1=SFDU-SFam	2578.98	2235.12
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	SAQ	2=MFDU-MFam	5248.28	5458.22
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	CATI	1=SFDU-SFam	1605.95	917.69
Batch 1-2	DSF_Latino_incidence_young_adult	1=Spanish	CATI	2=MFDU-MFam	560.25	0.00
STRATA_NAME					**14410.06**	**78604.97**

Batch	STRATA_NAME	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	Total Wt3 if 1 in HH when missing: TWT0	twt5
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	1=SFDU-SFam	20856.02	1681516.80
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	2=MFDU-MFam	25038.00	690521.67
Batch 1-2	DSF_No_model_incidence	0=Non-Span	Web	9=PO Box	2159.18	29148.87
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	1=SFDU-SFam	348978.59	352539.60
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	2=MFDU-MFam	186302.03	143101.56
Batch 1-2	DSF_No_model_incidence	0=Non-Span	SAQ	9=PO Box	17695.81	1105.99
Batch 1-2	DSF_No_model_incidence	0=Non-Span	CATI	1=SFDU-SFam	136942.30	64812.39
Batch 1-2	DSF_No_model_incidence	0=Non-Span	CATI	2=MFDU-MFam	52312.57	23778.44
Batch 1-2	DSF_No_model_incidence	1=Spanish	Web	1=SFDU-SFam	.	28404.95
Batch 1-2	DSF_No_model_incidence	1=Spanish	Web	2=MFDU-MFam	.	10651.86
Batch 1-2	DSF_No_model_incidence	1=Spanish	SAQ	1=SFDU-SFam	6683.52	10025.28
Batch 1-2	DSF_No_model_incidence	1=Spanish	SAQ	2=MFDU-MFam	3550.62	0.00
Batch 1-2	DSF_No_model_incidence	1=Spanish	CATI	1=SFDU-SFam	.	3341.76
Batch 1-2	DSF_No_model_incidence	1=Spanish	CATI	2=MFDU-MFam	.	3550.62
STRATA_NAME					**800518.64**	**3042499.78**
					972436.47	**3961395.42**

Table 43. Average household size, where HH size unknown

STRATA_NUM	Population size: PWT	Total Wt3 known HH Size: TWT5	Total Wt3 if 1 in HH when missing: TWT0	Average household size, where HH size unknown: D1_R1	Average household size, where HH size unknown (truncated): D1_R2
1=All others	4,261,024	3,042,500	800,519	1.52	1.52
2=Black 30+	255,394	221,348	51,625	0.66	0.66
3=Asian 30+	297,853	200,055	14,314	6.83	4.00
4=Latino 30+	445,136	335,535	81,512	1.34	1.34
5=Black 18-29	81,339	37,199	5,536	7.97	4.00
6=Asian 18-29	100,471	46,153	4,521	12.02	4.00
7=Latino 18-29	181,692	78,605	14,410	7.15	4.00

Using the average household size (d1_r2) in each stratum, the weight was evaluated as

$$\mathrm{WT4} = \mathrm{wt3} * d1_r 2.$$

The total weight (PWT_ST) in each stratum should equal the total population size (PWT_S) for each stratum. By truncating HH size, Table 44 shows that the total weight is changed for stratum that had household size truncated to 4.

Table 44. Population size based on 2021 PUMS MA population data, total weight based on truncated household size, and factor adjustment

STRATA_NUM	Population size: PWT_S	Total weight (HH size truncated to 4): PWT_ST	Factor adjustment: FACTOR
1=All others	4,261,024	4,261,024	1.00
2=Black 30+	255,394	255,394	1.00
3=Asian 30+	297,853	257,310	1.16
4=Latino 30+	445,136	445,136	1.00
5=Black 18-29	81,339	59,343	1.37
6=Asian 18-29	100,471	64,236	1.56
7=Latino 18-29	181,692	136,245	1.33

In order to insure that the total weight is equal to the total population size for each stratum, we adjust the truncated weight by a factor $\frac{T}{T_m}$, where $T = \sum_{i=1}^{n} w_i$ represents the total weight prior to truncating HH size, and $T_m = \sum_{i=1}^{n} w_{i,\mathrm{m}}^0$ represents the total weight after truncating HH size, to a multiple of the mean weight. The final step in forming the adjusted weight is to multiply the truncated weight by $\frac{T}{T_m}$, to form the adjusted weight

$$w_{i,m} = \left(\frac{T}{T_m}\right) w_{i,\mathrm{m}}^0 .$$

The weights adjusted for household size in Table 45 are WT4.

Table 45. Description of WT4 Assigned by Household Size and Other Address Characteristics

Batch	STRATA_NUM	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	HH Size Unknown Weight: WT4	HH Size=1 Weight: WT4	HH Size=2 Weight: WT4	HH Size=3 Weight: WT4	HH Size=4 Weight: WT4
Batch 1-2	1=All others	0=Non-Span	Web	1=SFDU-SFam	869	869	1,738	2,607	3,476
Batch 1-2	1=All others	0=Non-Span	Web	2=MFDU-MFam	1,318	1,318	2,636	3,953	5,271
Batch 1-2	1=All others	0=Non-Span	Web	9=PO Box	1,080	1,080	2,159	3,239	4,318
Batch 1-2	1=All others	0=Non-Span	SAQ	1=SFDU-SFam	890	890	1,781	2,671	3,561
Batch 1-2	1=All others	0=Non-Span	SAQ	2=MFDU-MFam	1,350	1,350	2,700	4,050	5,400
Batch 1-2	1=All others	0=Non-Span	SAQ	9=PO Box	1,106	1,106	2,212	3,318	4,424
Batch 1-2	1=All others	0=Non-Span	CATI	1=SFDU-SFam	1,045	1,045	2,091	3,136	4,181
Batch 1-2	1=All others	0=Non-Span	CATI	2=MFDU-MFam	1,585	1,585	3,170	4,756	6,341
Batch 1-2	1=All others	1=Spanish	Web	1=SFDU-SFam	1,671	1,671	3,342	5,013	6,684
Batch 1-2	1=All others	1=Spanish	Web	2=MFDU-MFam	1,775	1,775	3,551	5,326	7,101
Batch 1-2	1=All others	1=Spanish	SAQ	1=SFDU-SFam	1,671	1,671	3,342	5,013	6,684
Batch 1-2	1=All others	1=Spanish	SAQ	2=MFDU-MFam	1,775	1,775	3,551	5,326	7,101
Batch 1-2	1=All others	1=Spanish	CATI	1=SFDU-SFam	3,342	3,342	6,684	10,025	13,367
Batch 1-2	1=All others	1=Spanish	CATI	2=MFDU-MFam	3,551	3,551	7,101	10,652	14,202
Batch 1-2	2=Black 30+	0=Non-Span	Web	1=SFDU-SFam	126	126	253	379	506
Batch 1-2	2=Black 30+	0=Non-Span	Web	2=MFDU-MFam	164	164	327	491	654
Batch 1-2	2=Black 30+	0=Non-Span	Web	9=PO Box	84	84	169	253	337
Batch 1-2	2=Black 30+	0=Non-Span	SAQ	1=SFDU-SFam	129	129	259	388	517
Batch 1-2	2=Black 30+	0=Non-Span	SAQ	2=MFDU-MFam	167	167	335	502	669
Batch 1-2	2=Black 30+	0=Non-Span	SAQ	9=PO Box	86	86	172	258	345
Batch 1-2	2=Black 30+	0=Non-Span	CATI	1=SFDU-SFam	151	151	301	452	603
Batch 1-2	2=Black 30+	0=Non-Span	CATI	2=MFDU-MFam	195	195	390	585	780
Batch 1-2	2=Black 30+	1=Spanish	Web	1=SFDU-SFam	213	213	425	638	851
Batch 1-2	2=Black 30+	1=Spanish	Web	2=MFDU-MFam	246	246	493	739	986
Batch 1-2	2=Black 30+	1=Spanish	SAQ	1=SFDU-SFam	223	223	446	668	891
Batch 1-2	2=Black 30+	1=Spanish	SAQ	2=MFDU-MFam	258	258	516	774	1,032
Batch 1-2	2=Black 30+	1=Spanish	CATI	1=SFDU-SFam	284	284	567	851	1,134
Batch 1-2	2=Black 30+	1=Spanish	CATI	2=MFDU-MFam	329	329	657	986	1,314
Batch 3	2=Black 30+	0=Non-Span	Web	1=SFDU-SFam	77	77	154	231	308
Batch 3	2=Black 30+	0=Non-Span	Web	2=MFDU-MFam	105	105	210	315	420
Batch 3	2=Black 30+	0=Non-Span	CATI	1=SFDU-SFam	106	106	212	318	424
Batch 3	2=Black 30+	0=Non-Span	CATI	2=MFDU-MFam	144	144	289	433	578
Batch 1-2	3=Asian 30+	0=Non-Span	Web	1=SFDU-SFam	84	73	146	219	292
Batch 1-2	3=Asian 30+	0=Non-Span	Web	2=MFDU-MFam	117	101	203	304	406
Batch 1-2	3=Asian 30+	0=Non-Span	SAQ	1=SFDU-SFam	87	75	150	225	299

Batch	STRATA_NUM	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	HH Size Unknown Weight: WT4	HH Size=1 Weight: WT4	HH Size=2 Weight: WT4	HH Size=3 Weight: WT4	HH Size=4 Weight: WT4
Batch 1-2	3=Asian 30+	0=Non-Span	SAQ	2=MFDU-MFam	121	104	208	313	417
Batch 1-2	3=Asian 30+	0=Non-Span	CATI	1=SFDU-SFam	107	92	185	277	369
Batch 1-2	3=Asian 30+	0=Non-Span	CATI	2=MFDU-MFam	149	129	257	386	514
Batch 1-2	3=Asian 30+	1=Spanish	Web	1=SFDU-SFam	235	203	406	609	813
Batch 1-2	3=Asian 30+	1=Spanish	SAQ	1=SFDU-SFam	235	203	406	609	813
Batch 3	3=Asian 30+	0=Non-Span	Web	1=SFDU-SFam	135	117	234	350	467
Batch 3	3=Asian 30+	0=Non-Span	Web	2=MFDU-MFam	162	140	281	421	561
Batch 3	3=Asian 30+	0=Non-Span	CATI	1=SFDU-SFam	159	138	275	413	551
Batch 3	3=Asian 30+	0=Non-Span	CATI	2=MFDU-MFam	194	167	334	502	669
Batch 3	3=Asian 30+	1=Spanish	Web	1=SFDU-SFam	119	103	206	310	413
Batch 3	3=Asian 30+	1=Spanish	Web	2=MFDU-MFam	112	97	193	290	387
Batch 3	3=Asian 30+	1=Spanish	CATI	1=SFDU-SFam	239	206	413	619	826
Batch 3	3=Asian 30+	1=Spanish	CATI	2=MFDU-MFam	224	193	387	580	774
Batch 1-2	4=Latino 30+	0=Non-Span	Web	1=SFDU-SFam	213	213	427	640	853
Batch 1-2	4=Latino 30+	0=Non-Span	Web	2=MFDU-MFam	302	302	603	905	1,206
Batch 1-2	4=Latino 30+	0=Non-Span	Web	9=PO Box	109	109	218	327	436
Batch 1-2	4=Latino 30+	0=Non-Span	SAQ	1=SFDU-SFam	212	212	424	636	848
Batch 1-2	4=Latino 30+	0=Non-Span	SAQ	2=MFDU-MFam	300	300	599	899	1,198
Batch 1-2	4=Latino 30+	0=Non-Span	SAQ	9=PO Box	108	108	217	325	434
Batch 1-2	4=Latino 30+	0=Non-Span	CATI	1=SFDU-SFam	239	239	479	718	957
Batch 1-2	4=Latino 30+	0=Non-Span	CATI	2=MFDU-MFam	338	338	677	1,015	1,353
Batch 1-2	4=Latino 30+	1=Spanish	Web	1=SFDU-SFam	300	300	599	899	1,198
Batch 1-2	4=Latino 30+	1=Spanish	Web	2=MFDU-MFam	419	419	837	1,256	1,674
Batch 1-2	4=Latino 30+	1=Spanish	SAQ	1=SFDU-SFam	309	309	617	926	1,234
Batch 1-2	4=Latino 30+	1=Spanish	SAQ	2=MFDU-MFam	431	431	862	1,293	1,724
Batch 1-2	4=Latino 30+	1=Spanish	SAQ	9=PO Box	162	162	325	487	649
Batch 1-2	4=Latino 30+	1=Spanish	CATI	1=SFDU-SFam	332	332	664	997	1,329
Batch 1-2	4=Latino 30+	1=Spanish	CATI	2=MFDU-MFam	464	464	928	1,392	1,856
Batch 3	4=Latino 30+	0=Non-Span	Web	1=SFDU-SFam	61	61	122	183	244
Batch 3	4=Latino 30+	0=Non-Span	Web	2=MFDU-MFam	81	81	162	243	324
Batch 3	4=Latino 30+	0=Non-Span	CATI	1=SFDU-SFam	153	153	307	460	614
Batch 3	4=Latino 30+	0=Non-Span	CATI	2=MFDU-MFam	204	204	408	612	816
Batch 3	4=Latino 30+	1=Spanish	Web	1=SFDU-SFam	114	114	228	342	457
Batch 3	4=Latino 30+	1=Spanish	Web	2=MFDU-MFam	123	123	246	369	491
Batch 3	4=Latino 30+	1=Spanish	CATI	1=SFDU-SFam	225	225	450	674	899
Batch 3	4=Latino 30+	1=Spanish	CATI	2=MFDU-MFam	242	242	484	726	968
Batch 1-2	5=Black 18-29	0=Non-Span	Web	1=SFDU-SFam	154	113	225	338	451

Batch	STRATA_NUM	Language: LANGSP	Mode of Resp: MODE_ATTEMPT	Type of Address: ADDTYP	HH Size Unknown Weight: WT4	HH Size=1 Weight: WT4	HH Size=2 Weight: WT4	HH Size=3 Weight: WT4	HH Size=4 Weight: WT4
Batch 1-2	5=Black 18-29	0=Non-Span	Web	2=MFDU-MFam	201	147	293	440	587
Batch 1-2	5=Black 18-29	0=Non-Span	SAQ	1=SFDU-SFam	161	118	235	353	470
Batch 1-2	5=Black 18-29	0=Non-Span	SAQ	2=MFDU-MFam	210	153	306	459	612
Batch 1-2	5=Black 18-29	0=Non-Span	CATI	1=SFDU-SFam	212	155	310	465	620
Batch 1-2	5=Black 18-29	0=Non-Span	CATI	2=MFDU-MFam	276	202	403	605	807
Batch 1-2	5=Black 18-29	1=Spanish	Web	1=SFDU-SFam	396	289	577	866	1,154
Batch 1-2	5=Black 18-29	1=Spanish	Web	2=MFDU-MFam	289	211	422	633	843
Batch 1-2	5=Black 18-29	1=Spanish	SAQ	2=MFDU-MFam	434	316	633	949	1,265
Batch 1-2	5=Black 18-29	1=Spanish	CATI	1=SFDU-SFam	396	289	577	866	1,154
Batch 1-2	5=Black 18-29	1=Spanish	CATI	2=MFDU-MFam	289	211	422	633	843
Batch 1-2	6=Asian 18-29	0=Non-Span	Web	1=SFDU-SFam	142	91	181	272	363
Batch 1-2	6=Asian 18-29	0=Non-Span	Web	2=MFDU-MFam	143	92	183	275	367
Batch 1-2	6=Asian 18-29	0=Non-Span	SAQ	1=SFDU-SFam	145	93	186	278	371
Batch 1-2	6=Asian 18-29	0=Non-Span	SAQ	2=MFDU-MFam	147	94	188	281	375
Batch 1-2	6=Asian 18-29	0=Non-Span	CATI	1=SFDU-SFam	153	98	195	293	390
Batch 1-2	6=Asian 18-29	0=Non-Span	CATI	2=MFDU-MFam	154	99	197	296	395
Batch 1-2	6=Asian 18-29	1=Spanish	Web	1=SFDU-SFam	113	72	144	216	288
Batch 1-2	6=Asian 18-29	1=Spanish	Web	2=MFDU-MFam	254	162	324	487	649
Batch 1-2	6=Asian 18-29	1=Spanish	SAQ	1=SFDU-SFam	113	72	144	216	288
Batch 3	6=Asian 18-29	0=Non-Span	Web	1=SFDU-SFam	310	198	396	595	793
Batch 3	6=Asian 18-29	0=Non-Span	Web	2=MFDU-MFam	261	167	333	500	667
Batch 3	6=Asian 18-29	0=Non-Span	CATI	2=MFDU-MFam	335	214	429	643	857
Batch 1-2	7=Latino 18-29	0=Non-Span	Web	1=SFDU-SFam	134	101	201	302	402
Batch 1-2	7=Latino 18-29	0=Non-Span	Web	2=MFDU-MFam	206	154	309	463	618
Batch 1-2	7=Latino 18-29	0=Non-Span	SAQ	1=SFDU-SFam	138	103	207	310	414
Batch 1-2	7=Latino 18-29	0=Non-Span	SAQ	2=MFDU-MFam	212	159	318	476	635
Batch 1-2	7=Latino 18-29	0=Non-Span	SAQ	9=PO Box	25	19	37	56	74
Batch 1-2	7=Latino 18-29	0=Non-Span	CATI	1=SFDU-SFam	152	114	228	342	456
Batch 1-2	7=Latino 18-29	0=Non-Span	CATI	2=MFDU-MFam	233	175	350	525	700
Batch 1-2	7=Latino 18-29	1=Spanish	Web	1=SFDU-SFam	219	164	328	492	655
Batch 1-2	7=Latino 18-29	1=Spanish	Web	2=MFDU-MFam	267	200	400	600	800
Batch 1-2	7=Latino 18-29	1=Spanish	SAQ	1=SFDU-SFam	229	172	344	516	688
Batch 1-2	7=Latino 18-29	1=Spanish	SAQ	2=MFDU-MFam	280	210	420	630	840
Batch 1-2	7=Latino 18-29	1=Spanish	CATI	1=SFDU-SFam	306	229	459	688	918
Batch 1-2	7=Latino 18-29	1=Spanish	CATI	2=MFDU-MFam	374	280	560	840	1,121

Step 5. Adjusting weights using raking based on cross-classified pairs of the variables age, gender, age, race/ethnicity, education

We consider four variables: age (18-34, 35-49, 50-64, 65+), gender (male, female), race/ethnicity (Hispanic, Black (only), Asian (only), White/other), and education (high school or less, some college/college graduate, some postgraduate education). We consider these variables individually and pair-wise. For some variables, we also consider a collapsed set of categories (i.e., for race/ethnicity: Hispanic/ Asian and Black/Asian, and for education: high school or less, or more than high school).

Primary Variables for Raking Weights for using the 2021 PUMS Population Data

We determined raking variables via a preliminary analysis of the 2021 one-year American Community Survey Public Use Microdata Sample (PUMS) files. In an ideal setting, reliable PUMS data for population totals would be available for a full cross-classification of weighting variables. In practice, estimates of the population based on the PUMS data are based on an approximate 1% sample of the MA population and the PUMS data themselves are weighted to estimate the number of individuals in each post-stratum. We evaluate the reliability of the PUMS estimates of totals in cells formed by individual variables and a cross-classification of pairs of the variables. Reliability was evaluated by: (1) the number of PUMS respondents for each possible raking cell and (2) calculating the CVM in the estimated total PUMS weight. The CVM is the estimated standard error of the mean, divided by the mean, and expressed as a percent.

Table 46 provides the CVM and the number of respondents in the 2021 PUMS for each of the four variables used in weighting. The CVM was less than 10% for all cells, and in all cells, there are greater than 20 respondents.

Table 46. CVM and N by Age, Gender, Race, and Education using 2021 PUMS Data

PUMS 2021	AGE			
	1=18-34	2=35-49	3=50-64	4=65+
CVM (Wt)	0.6%	0.6%	0.6%	0.6%
n	17,050	12,549	15,340	15,460

PUMS 2021	GENDER	
	1=Male	2=Female
CVM (Wt)	0.4%	0.4%
n	28,568	31,831

PUMS 2021	RACE			
	1=Hispanic	2=White/other	3=Black	4=Asian
CVM (Wt)	1.0%	0.3%	1.4%	1.1%
n	4,989	48,171	2,907	4,332

PUMS 2021	EDUCATION		
	1=<=HS	2=Col	3=Grad
CVM (Wt)	0.6%	0.4%	0.6%
n	18,320	29,498	12,581

Next, we consider pair-wise cross-classifications of the weighting variables Table 47. The CVM was less than 10% for all cells, and in all cells, there are greater than 20 respondents.

Table 47. CVM and N by Two Variables for using 2021 PUMS Data

PUMS 2021		AGE			
		1=18-34	2=35-49	3=50-64	4=65+
CVM (Wt)	GENDER	0.8%	0.9%	0.8%	0.8%
	1=Male				
	2=Female	0.8%	0.9%	0.8%	0.7%
n	GENDER	8,284	6,079	7,375	6,830
	1=Male				
	2=Female	8,766	6,470	7,965	8,630

PUMS 2021		AGE			
		1=18-34	2=35-49	3=50-64	4=65+
CVM (Wt)	EDUCATION	1.1%	1.4%	1.1%	1.0%
	1=<=HS				
	2=Col	0.8%	0.9%	0.8%	0.8%
	3=Grad	1.4%	1.0%	1.1%	1.1%
n	EDUCATION	4,807	2,980	4,779	5,754
	1=<=HS				
	2=Col	9,834	5,910	7,311	6,443
	3=Grad	2,409	3,659	3,250	3,263

PUMS 2021		AGE			
		1=18-34	2=35-49	3=50-64	4=65+
CVM (Wt)	RACE	1.6%	1.9%	2.3%	2.7%
	1=Hispanic				
	2=White/other	0.7%	0.7%	0.6%	0.6%
	3=Black	2.6%	2.6%	2.7%	2.9%
	4=Asian	1.9%	2.0%	2.1%	2.9%
n	RACE	2,120	1,314	975	580
	1=Hispanic				
	2=White/other	12,235	9,326	12,765	13,845
	3=Black	1,010	691	671	535
	4=Asian	1,685	1,218	929	500

PUMS 2021		RACE			
		1=Hispanic	2=White/other	3=Black	4=Asian
CVM (Wt)	GENDER	1.5%	0.5%	2.0%	1.7%
	1=Male				
	2=Female	1.3%	0.4%	1.9%	1.4%
n	GENDER	2,351	22,803	1,395	2,019
	1=Male				
	2=Female	2,638	25,368	1,512	2,313

PUMS 2021		RACE			
		1=Hispanic	2=White/other	3=Black	4=Asian
CVM (Wt)	EDUCATION	1.3%	0.7%	2.2%	2.3%
	1=<=HS				
	2=Col	1.7%	0.4%	2.0%	1.7%
	3=Grad	3.6%	0.6%	3.8%	1.7%

n	**EDUCATION**	2,641	13,461	1,187	1,031
	1=<=HS				
	2=Col	1,903	24,360	1,400	1,835
	3=Grad	445	10,350	320	1,466

PUMS 2021		EDUCATION		
		1=<=HS	**2=Col**	**3=Grad**
CVM (Wt)	**GENDER**	0.8%	0.6%	0.9%
	1=Male			
	2=Female	0.8%	0.6%	0.8%
n	**GENDER**	9,420	13,482	5,666
	1=Male			
	2=Female	8,900	16,016	6,915

Respondents in the FGPS Survey

In addition to having stable estimates of the population total in each raking cell, we examine the number of respondents in the FGPS by possible raking variables. If there are few respondents in a particular category, the weight assigned to the subjects may be difficult to match to the population weights. When there are no respondents in a cell, the cell needs to be collapsed to match population weights. Table 48 considers each raking variable individually. Note that there are more than 10 respondents in each non-missing cell.

Table 48. Number of Respondents by Demographics for FGPS Survey

FGPS 2022 Survey	t n
AGE	
1=18-34	1356
2=35-49	1407
3=50-64	1415
4=65+	1521
5=Missing	594
GENDER	
1=Male	2541
2=Female	3613
3=Missing	139
RACE	
1=Hispanic	855
2=White	3397
3=Black	566
4=Asian	867
5=Missing	608
EDUCATION	
1=<=HS	819
2=Col	3044
3=Grad	2056
4=Missing	374

We next considered two way cross-classifications of variables, and examined cells to see if there were at least 10 respondents. The resulting cross-classifications are given in Table 49. The results indicate that there are greater than 10 respondents in each demographic cell in the two-way classifications similar to those in the PUMS data.

Table 49. Number of Respondents by Demographics for FGPS Survey

FGPS 2022 Survey	AGE				
	1=18-34	2=35-49	3=50-64	4=65+	5=Missing
GENDER					
1=Male	524	549	586	667	215
2=Female	797	849	822	848	297
3=Missing	35	9	7	6	82
RACE					
1=Hispanic	303	228	181	83	60
2=White	619	659	819	1128	172
3=Black	98	145	144	127	52
4=Asian	258	279	176	72	82
5=Missing	78	96	95	111	228
EDUCATION					
1=<=HS	173	130	198	247	71
2=Col	764	646	710	699	225
3=Grad	359	579	440	510	168
4=Missing	60	52	67	65	130

FGPS 2022 Survey	GENDER		
	1=Male	2=Female	3=Missing
RACEV1			
1=Hispanic	291	551	13
2=White	1394	1962	41
3=Black	169	386	11
4=Asian	447	407	13
5=Miss	240	307	61
EDUCATION			
1=<=HS	337	471	11
2=Col	1169	1816	59
3=Grad	896	1129	31
4=Missing	139	197	38

FGPS 2022 Survey	EDUCATION			
	1=<=HS	2=Col	3=Grad	4=Missing
RACE				
1=Hispanic	237	455	129	34
2=White	393	1768	1201	35
3=Black	97	312	137	20
4=Asian	58	330	457	22
5=Missing	34	179	132	263

Raking Weights for the Follow-up General Population Survey using the 2022 ACS Population Data

We adjusted weights assigned to subjects to more closely align with the distribution of 18+ year old persons in MA by age (18-34, 35-49, 50-64, 65+), gender (male, female), race/ethnicity (Hispanic, Black (only), Asian (only), White and other), and education (high school or less, some college/college graduate, some post graduate education).

Similar to the BGPS, we elected to rake on pairs of primary variables and to use all possible pairs of the primary variables as raking variables. Raking by pairs of the primary variables guarantees a representative weight (i.e., a weight that matches the population weight) for each pair. This means that fitted models using weighting will properly represent the population distribution for up to two-way interactions with the primary outcome variables.

All the variables used for raking were missing for one or more respondents. We allowed for missing values for the primary variables when defining cells for raking. For example, the first raking variable, V1, was age X gender. If each of the primary variables was known on each respondent, V1 would have 8 categories corresponding to a cross-classification of the age x gender categories=4 x 2. Because age and gender were not reported by all respondents, we added a 5th category to age corresponding to "missing age" and a 3rd category to gender corresponding to "missing gender." As a result, the variable V1 used for raking had 15=5 x 3 categories.

With 4 primary variables, there are 6 ways of pairing primary variables to form raking variables. Each raking variable corresponds to a different pair of primary variables. Raking was accomplished in steps, by consecutively using each of the raking variables to align the sample weighted marginals to the population marginal. We refer to the consecutive raking of all 6 raking variables as an iteration. This process continued until the sample weights converged to the population weights for each of the raking variables.

Each of the SEIGMA respondents was assigned a survey weight, WT4, based on other characteristics prior to raking. The weights were assigned so that the total weight for the respondents matched the PUMS 2021 weight for MA.

Description of a Step in the Raking

Raking was accomplished using a SAS program written for this purpose. We summarize the process here using the first raking variable, V1, corresponding to age x gender. The first step was to evaluate the total weight (NWT4) in each of the 5 x 3 =15 cells for the sample. Let us refer to these weights by x_{jk} for j $=$ $1, \dots ,5$ (corresponding to age categories), and $\mathrm{k} = 1, \dots ,3$ (corresponding to gender categories, where j=5 corresponds to 'missing age' and k=3 corresponds to 'missing gender'). The population weights, p_{jk} , were based on the 2021 PUMS data. Among the population data, there were no missing values. Using the categories of age and gender, the total population was the sum over 4 x 2 = 8 cells, $p_{++} = \sum_{j=1}^{4}\sum_{k=1}^{2} p_{jk}$. As a result, when raking by the variable V1, we first re-allocated PUMS data to form categories representing "missing age."

Forming Adjusted Population Weights Accounting for Missing Values in Primary Variables

We illustrate the process of forming adjusted population weights using the adjustment for V1, age X gender, as an example. Let the total sample and population weight in age category j be given by $x_{j+} = \sum_{k=1}^{3} x_{jk}$ and $p_{j+} = \sum_{k=1}^{2} p_{jk}$, respectively. We assign population weights to cells in a strata where age

is missing proportional to the weight assigned these cells in the sample in the strata, $p^*_{j3} = p_{j+}\left(\frac{x_{j3}}{x_{j+}}\right)$. We refer to these population weights as 'adjusted' weights, since they are adjusted for missing values in the primary variables. Population weights for individual cells with age known in strata are adjusted to preserve the overall population weight in the strata, p_{j+}, such that $p^*_{jk} = p_{jk}\left(\frac{p_{j+}-p^*_{j3}}{p_{j+}}\right)$, for j $= 1, \ldots, 4$ and k $= 1,2$.

We illustrate this for V1, corresponding to Age X Gender in Table 50. Row A contains the initial PUMS data, and Row B contains the adjusted totals, accounting for missing age based on the survey respondents.

Table 50. Population and Sample Weight Totals Prior to Adjustments for V1

	18-34 Male	18-34 Female	18-34 Missing	35-49 Male	35-49 Female	35-49 Missing	50-64 Male	50-64 Female	50-64 Missing	65+ Male	65+ Female	65+ Missing	Missing Male	Missing Female	Missing Missing
A	829,353	840,815	0	646,453	659,959	0	697,906	730,218	0	538,177	680,028	0	0	0	0
B	755,883	766,329	31,259	589,185	601,495	7,687	636,080	665,530	3,654	490,501	619,786	7,318	149,329	240,510	58,362

A similar process was followed to adjust the population weights for missing values with other primary variables.

Matching Sample to Population Marginals for Steps with Raking Variables

The total sample weight assigned to a cell for a raking variable is the sum of WT4 assigned to respondents in that cell. We index categories for the 4 $j = 1,\ldots,5$ for age, $k = 1,\ldots,3$ for gender, $l = 1,\ldots,5$ for race, and $m = 1,\ldots,4$ for education. Respondents within a cell are indexed by $q = 1,\ldots,n_{ijklm}$. The total sample weight assigned to a cell for the first raking variable, V1, is given by

$$x_{jk} = \sum_{l=1}^{5}\sum_{m=1}^{4} x_{jklm} = \sum_{l=1}^{5}\sum_{m=1}^{4}\left(\sum_{q=1}^{n_{jklm}} x_{jklmq}\right),$$

where $x_{jklm} = \sum_{q=1}^{n_{jklm}} x_{jklmq}$. The first step in an iteration of raking aligns the sample marginal to the population marginal by forming the new weight for cells based on the full cross-classification of the five variables, such that

$$x^{(1)}_{jklm} = x_{jklm}\left(\frac{p^*_{jk}}{x_{jk}}\right).$$

Using these weights, the total weight is evaluated for each cell corresponding to the next raking variable, V2 (corresponding to age X race), i.e. $x^{(1)}_{jl} = \sum_{k=1}^{3}\sum_{m=1}^{4} x^{(1)}_{jklm}$. Once again, using the population marginal weights, we align the sample marginal to the population marginal for V2, such that

$$x^{(2)}_{jklm} = x^{(1)}_{jklm}\left(\frac{p^*_{jl}}{x^{(1)}_{jl}}\right).$$

This process is continued for each of the 6 raking variables, resulting in the marginal total weights in each cell after one iteration given by $r^1_{ijklm} = x^{(10)}_{ijklm}$. Table 51 summarizes the sample and aligned population weights prior to raking for each of the 6 raking variables.

Table 51. Sample and Aligned Population Weights Prior to Raking on 6 Variables

```
Iteration 0      Abs Diff          10875626

  61.4  57.3   189  48.9   102   115                    max=189.00530653    Max % Diff

Step 1: Age x Sex     18-34   |    35-49        |    50-64        |    65+          |  Miss
        Male  Female   Miss | Male  Female   Miss| Male  Female  Miss | Male  Female  Miss | Male  Female Miss
    ____________________________________________________________________________________________________________________________
    Pop 755883 766329 31,259 589185 601495  7,687 636080 665530  3,654 490501 619786  7,318 149329 240510 58,362
    Samp396364 580870 31,259 389415 693408  7,687 568779 820104  3,654 791907 883943  7,318 149329 240510 58,362

Step 2: Age x Race            18-34             |             35-49
        Hisp    White   Black   Asian   Miss | Hisp    White   Black   Asian   Miss
    ____________________________________________________________________________________________
    Pop  224,803  996,600  102,000  126,198   46,755  160,274  790,375   76,958  106,276   72,762
    Samp 162,527  617,580   50,959  130,670   46,755  132,450  703,730   66,032  115,537   72,762
                  35-49            |             65+
        Hisp    White   Black   Asian   Miss | Hisp    White   Black   Asian   Miss
    ____________________________________________________________________________________________
    Pop  102,473  997,560   69,078   70,411   70,756   56,498  913,766   44,227   42,835  104,102
    Samp 103,670  1093189   51,861   73,061   70,756   61,957  1437483   46,064   33,562  104,102
                  Miss Age
        Hisp    White   Black   Asian   Miss
    ____________________________________________
    Pop   29,121  225,120   14,335   28,989  150,637
    Samp  29,121  225,120   14,335   28,989  150,637

Step 3: Age x Edu             18-34       |                   35-49
        HS     Coll    Grad    Miss   | HS     Coll    Grad    Miss
    ____________________________________________________________________________________________
    Pop  447,897  830,191  205,838   33,161  316,698  548,796  295,239   37,553
    Samp 108,862  609,183  257,286   33,161   91,571  496,782  464,605   37,553
                  35-49       |                   65+
        HS     Coll    Grad    Miss   | HS     Coll    Grad    Miss
    ____________________________________________________________________________________________
    Pop  432,347  596,295  240,231   46,209  431,785  447,193  203,384   61,891
    Samp 134,075  728,824  483,428   46,209  245,299  788,187  587,791   61,891
                  Miss Age
        HS     Coll    Grad    Miss
    ____________________________________________
    Pop   49,321  188,689  124,183   86,008
    Samp  49,321  188,689  124,183   86,008

Step 4: Sex x Race            Male              |             Female
        Hisp    White   Black   Asian   Miss | Hisp    White   Black   Asian   Miss
    ____________________________________________________________________________________________
    Pop      .       .       .       .       .       .       .       .       .       .
    Samp     .       .       .       .       .       .       .       .       .       .
                  Missing
        Hisp    White   Black   Asian   Miss
    ____________________________________________
    Pop    5,565   47,905    4,845    4,879   45,086
    Samp   5,565   47,905    4,845    4,879   45,086

Step 5: Sex x Edu             Male        |                   Female
        HS     Coll    Grad    Miss   | HS     Coll    Grad    Miss
    ____________________________________________________________________________________________
    Pop  899,292  1189603  455,459  108,250  820,603  1368469  542,111  130,843
    Samp 276,604  1107003  803,938  108,250  342,054  1652527  1093411  130,843
                  Missing
        HS     Coll    Grad    Miss
    ____________________________________________
    Pop   10,470   52,136   19,943   25,731
    Samp  10,470   52,136   19,943   25,731

Step 6: Race x Edu            Hisp        |       White
        HS     Coll    Grad    Miss   | HS     Coll    Grad    Miss
    ____________________________________________________________________________________________
    Pop  320,479  203,216   45,043   14,724  1131874  1965376  768,898   43,565
    Samp 132,362  245,926   96,714   14,724  415,446  2138235  1479856   43,565
                  Black       |       Asian
```

	HS	Coll	Grad	Miss	HS	Coll	Grad	Miss
Pop	114,294	157,510	33,723	7,304	96,615	147,738	117,058	10,479
Samp	43,083	118,971	59,892	7,304	25,605	163,760	181,975	10,479

Missing

	HS	Coll	Grad	Miss
Pop	12,632	144,774	98,856	188,752
Samp	12,632	144,774	98,856	188,752

Iterating Raking

We repeat the process of aligning the marginals over the 6 raking variables using the raked marginal, $r_{jklm}^{(t-1)}$, until the marginal totals based on the raked weights, i.e.,

$$r_{jk}^{t} = \sum_{l=1}^{5} \sum_{m=1}^{4} r_{jklm}^{t}$$

for cells in V1-V6 at iteration t, are sufficiently close to the population marginal weights, p_{jk}^{*}. The criterion for closeness is the maximum (over all cells) of the percent difference in weight between the raked sample weight and the population weight. This criterion is determined by evaluating the maximum percent difference in marginal weight for each raking variable, given by

$$m_1^t = max\left[100\left(\frac{r_{jk}^t - p_{jk}^*}{p_{jk}^*}\right); j = 1,\ldots,5\,; k = 1,\ldots,3\right]$$

for V1, $m_2^t = max\left[100\left(\frac{r_{jl}^t - p_{jl}^*}{p_{jl}^*}\right); j = 1,\ldots,5\,; l = 1,\ldots,5\right]$ for V2, etc., and then taking the maximum of these percent differences, given by $m^t = max(m_1^t, m_2^t, m_3^t, \ldots, m_6^t)$.

The raking procedure stops when m^t is below a value that is set as the largest possible acceptable percent difference between sample and population marginal weights. This difference is set at $m(\max) = 10\%$, implying that the maximum difference between the raked weights and the population weights is at most 10%.

The criteria for stopping iterations for raking is based in part on the coefficient of variation for population values for the marginals and in part on the performance of the raking procedure using the 10 raking variables. The population marginals are constructed from PUMS data, which in turn are based on a weighted one percent sample of MA subjects. Using the basic PUMS data, we calculated the coefficient of variation of the total for each marginal population cell. All of the coefficients of variation are less than 3 percent. A value of $m(\max) = 10\%$ is large enough to account for this level of population variability.

The second factor leading to setting $m(\max) = 10\%$ is based on experience with the raking program.

With the 6 raking variables resulted in the program converging to a m^t of approximately 6% after 4 iterations, with $m^t = 5.74\%$. The final raked weights are summarized in Table 52.

Table 52. Comparison of Raking Variable Weights with Population Weights after Adjustment.

```
Iteration  50     Abs Diff          437,012

  3.39  5.67  1.92  3.37  4.96  5.75                    maxpct=5.746665292  Max % Diff

Step 1: Age x Sex     18-34  |   35-49       |   50-64       |   65+         |  Miss
        Male  Female   Miss | Male  Female   Miss| Male  Female  Miss | Male  Female  Miss | Male  Female Miss
    ____________________________________________________________________________________________________________________________
    Pop 755883 766329 31,259 589185 601495  7,687 636080 665530  3,654 490501 619786  7,318 149329 240510 58,362
    Samp747297 741583 30,917 595937 595506  7,779 647520 663155  3,721 506907 626955  7,567 150990 238036 59,038

Step 2: Age x Race            18-34            |            35-49
        Hisp    White   Black   Asian   Miss | Hisp    White   Black   Asian   Miss
    ____________________________________________________________________________________________________
    Pop  224,803  996,600  102,000  126,198   46,755  160,274  790,375   76,958  106,276   72,762
    Samp 236,679  1030672  107,786  129,732   48,602  161,468  782,163   77,818  104,543   72,375
                  35-49            |            65+
        Hisp    White   Black   Asian   Miss | Hisp    White   Black   Asian   Miss
    ____________________________________________________________________________________________________
    Pop  102,473  997,560   69,078   70,411   70,756   56,498  913,766   44,227   42,835  104,102
    Samp 103,660  991,250   70,137   69,547   70,669   55,238  877,581   43,401   40,893  100,493
                  Miss Age
        Hisp    White   Black   Asian   Miss
    ____________________________________________
    Pop   29,121  225,120   14,335   28,989  150,637
    Samp  29,551  224,401   14,600   28,723  150,925

Step 3: Age x Edu             18-34       |                  35-49
        HS     Coll    Grad    Miss   | HS     Coll    Grad    Miss
    ____________________________________________________________________________________________
    Pop  447,897  830,191  205,838   33,161  316,698  548,796  295,239   37,553
    Samp 439,990  821,373  202,378   32,616  317,786  554,623  296,508   37,728
                  35-49       |                  65+
        HS     Coll    Grad    Miss   | HS     Coll    Grad    Miss
    ____________________________________________________________________________________________
    Pop  432,347  596,295  240,231   46,209  431,785  447,193  203,384   61,891
    Samp 429,288  596,315  238,736   45,939  436,948  455,779  205,993   62,709
                  Miss Age
        HS     Coll    Grad    Miss
    ____________________________________________
    Pop   49,321  188,689  124,183   86,008
    Samp  49,150  189,379  123,858   85,815

Step 4: Sex x Race            Male             |             Female
        Hisp    White   Black   Asian   Miss | Hisp    White   Black   Asian   Miss
    ____________________________________________________________________________________________________
    Pop  447,897  830,191  205,838   33,161  316,698  548,796  295,239   37,553  432,347  596,295
    Samp 439,990  821,373  202,378   32,616  317,786  554,623  296,508   37,728  429,288  596,315
                  Missing
        Hisp    White   Black   Asian   Miss
    ____________________________________________
    Pop   5,565   47,905   4,845   4,879   45,086
    Samp  5,536   47,641   4,758   4,965   44,775

Step 5: Sex x Edu             Male        |                  Female
        HS     Coll    Grad    Miss   | HS     Coll    Grad    Miss
    ____________________________________________________________________________________________
    Pop  899,292  1189603  455,459  108,250  820,603  1368469  542,111  130,843
    Samp 873,734  1191034  478,040  108,512  796,103  1368091  568,148  130,967
                  Missing
        HS     Coll    Grad    Miss
    ____________________________________________
    Pop   10,470   52,136   19,943   25,731
    Samp  10,096   51,808   20,775   25,600

Step 6: Race x Edu            Hisp        |       White
        HS     Coll    Grad    Miss   | HS     Coll    Grad    Miss
    ____________________________________________________________________________________________
    Pop  320,479  203,216   45,043   14,724  1131874  1965376  768,898   43,565
    Samp 326,593  199,537   42,455   14,525  1174590  1965131  737,983   43,764
                  Black       |       Asian
```

```
      HS     Coll    Grad    Miss  | HS     Coll    Grad    Miss
_____________________________________________________________________________________
Pop  114,294  157,510  33,723   7,304  96,615  147,738  117,058  10,479
Samp 117,540  156,073  32,075   7,271  98,582  145,245  110,470  10,350
                 Missing
      HS     Coll    Grad    Miss
_____________________________________
Pop   12,632  144,774  98,856  188,752
Samp  13,060  144,221  94,530  188,913
```

Step 6. Trimming of weights by setting the minimum weight to be the average weight/8, and the maximum weight to be average weight times 8

Weights developed via this process can have a broad range for individual respondents. Although the weights provide in theory a way of obtaining unbiased estimates of population parameters, variability in weights will inflate the variance of the estimates. For this reason, trimming the weights can be desirable to improve the overall estimation accuracy. Trimming was examined in the BGPS weight development. We apply the strategy for trimming weights developed in the BGPS to weights developed for the FGPS.

The distribution of weights for the 6,293 respondents is summarized in Table 53 for each step in the weight development. Notice the large differences that occur in the maximum weight when accounting for household size, or aligning the weights to the Massachusetts population (using the raked weights). The distribution of the weights generated by NORC based on post-stratification by batch, strata, age, race, and gender is given in the last row of Table 53 for comparison.

Table 53. Description of weights prior to trimming

Weight	Min	Median	Mean	Max
WT1-Design	5	19	93	222
WT2-Screen	18	198	457	1,775
WT3-Complete	19	200	470	3,551
WT4-HH Size	51	483	894	6,684
WT5-Raked	21	472	894	20,144
NORC WT	51	483	894	6,684

Trimming Raked Weights

We describe the procedure for trimming raked weights next. Let $w_{\min}$ represent the minimum weight, w_{mean} represent the mean weight, and $w_{\max}$ represent the maximum weight. We define trimmed weight by setting the minimum and maximum weight to be a simple multiplier, m, times the average weight, w_{mean}. The initial trimmed weight is given by

$$w_{i,\mathrm{m}}^{0} = \begin{cases} w_{\max,m} \text{ if } w_i \geq w_{\max,m} \\ w_i \\ w_{\min,m} \text{ if } w_i \leq w_{\min,m} \end{cases}.$$

where $w_{\max,m} = m\left(w_{mean}\right)$ and $w_{\min,m} = \left(w_{mean}\right)/m$. By changing the minimum and maximum weight, the total weight is changed. In order to insure that the total weight is equal to the total population size, we adjust the initial trimmed weight by a factor $\frac{T}{T_m}$, where $T = \sum_{i=1}^{n} w_i$ represents the total raked weight

prior to trimming, and $T_m = \sum_{i=1}^{n} w_{i,\mathrm{m}}^{0}$ represents the total weight after trimming weights to a multiple of the mean weight. The final step in forming the trimmed weight is to multiply the initial trimmed weight by $\frac{T}{T_m}$, to form the trimmed weight

$$w_{i,m} = \left(\frac{T}{T_m}\right) w_{i,\mathrm{m}}^{0}.$$

Determining the Extent of Trimming

In the BGPS, we determined the multiplier used to trim weights by evaluating the accuracy of estimators for values of $m = 2,3,4,5,6,7,8,9$ for the variables defined as a) problem gambler; b) at-risk gambler; c) tobacco user; and d) participant in extreme sports. An unbiased estimator of the variable was assumed to be the estimator without trimming. Using this process, we found that the most accurate estimator will occur when $m = 8$.

By setting $m = 8$, the minimum and maximum raked weights are given by 111.75 and 7152, respectively. Table 54 shows the weight for each step of the process. The resulting weight, WT6 is the final weight for the FGPS.

Table 54. Summary of weight at each step

Variable	Label	N	Minimum	Mean	Maximum	Std Dev	Sum
wt1	Base sampling Wt: WT1	6293	4.9876007	93.4178330	221.9136493	98.0549616	587878.42
wt2	Screen Adjusted Wt: WT2	6293	18.0825333	456.8401913	1775.31	429.6759514	2874895.32
wt3	Completion Adjusted Wt: WT3	6293	18.5991771	470.1171665	3550.62	444.1396912	2958447.33
wt4	Household size Wt: WT4	6293	50.7412647	893.5180359	6683.52	871.2607322	5622909.00
wt5	Raked Weight: WT5	6293	21.4380440	893.5180359	20143.95	1299.33	5622909.00
wt6	Trimmed Raked Wt: WT6	6293	113.9969615	893.5180359	7295.81	1141.87	5622909.00

Data Cleaning and Statistical Analysis

NORC delivered the data to the SEIGMA research team via a secure file transfer protocol (SFTP). The dataset contained 47,240 records and included both complete and incomplete questionnaire responses. After review, incompletes were separated from the completed surveys and a partial dataset of incomplete surveys was created (n=40,947). A second dataset of complete surveys (n=6,293) was created, carefully reviewed and cleaned. Several constructed variables were then created and added to the final dataset (n=6,293).

Statistical analysis of survey data where respondents have unequal weights is more complex than standard statistical analysis due to the need to properly account for the weights in estimating parameters and their variance. Special software and statistics have been developed for such situations. The Follow-up General Population Survey data were analyzed using SAS-callable SUDAAN, release 11.0.4. SUDAAN enables appropriate calculation of variance estimations for data from surveys using complex sampling strategies. When exact expressions for the variance were not possible, the Taylor series linearization method was used combined with variance estimation formulas specific to the sample design.

Appendix B5: Item Response Rate by Data Collection Mode

	Percent complete	
	WEB/phone	SAQ
d1_R RECODED: How many members of your household, including yourself, are 18 years of age or older?	95.6	1.3
d2_R RECODED: Are you male or female?	98.3	98.9
d3_R RECODED: In what year were you born?	88.9	95.8
c1_R RECODED: Which of the following is your preferred recreational activity?	100.0	98.8
C3_R RECODED: Over the past 12 months, would you say that in general your health has been…?	100.0	99.2
C4_R RECODED: In the past 12 months, how would you rate your overall level of stress?	99.1	99.2
C5_R RECODED: In the past 12 months, how would you rate your overall level of happiness?	99.0	99.3
C6A_R RECODED: Have you smoked at least 100 cigarettes in your entire life?	99.9	98.7
C6B_R RECODED: Would you say you now smoke cigarettes…	99.8	97.5
C6C_R RECODED: Do you currently smoke cigars, pipe tobacco, or hookah tobacco (shisha), or use dipping tobacco (including snus), chewing tobacco, or snuff…?	99.9	98.4
C6D_R RECODED: Do you now use e-cigarettes or other electronic vaping products every day, some days, or not at all?	98.9	99.1
C7A_R RECODED: Have you used alcohol in the past 12 months?	99.9	98.9
C8_R RECODED: In the past 12 months have you used any marijuana, hallucinogens (such as LSD, mushrooms, or PCP), cocaine, heroin or opium, or any other drugs not intended for medical use?	99.9	99.1
C9A_R RECODED: Have you had any problems with drugs or alcohol in the past 12 months? By this we mean difficulties in controlling their use that have led to negative consequences for you or other people.	99.9	98.9
C9B_R RECODED: During the past 12 months, have you sought help for your use of alcohol or drugs?	99.9	98.7
C10A_R RECODED: Have you had problems with other behavior in the past 12 months such as overeating, sex or pornography, shopping, exercise, Internet chat lines, or other things?	99.8	99.3
C11A_R RECODED: In the past 30 days, have you had any serious problems with depression, anxiety or other mental health problems?	99.8	98.0
C11B_R RECODED: How about in the last 12 months?	99.6	84.7
C12_R RECODED: Do you now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed, or a special telephone?	99.9	99.3
C14_R RECODED: To what extent do you agree or disagree with the following statement I consider my neighborhood to be safe from crime. Would you say…	100.0	99.1

	Percent complete	
	WEB/phone	SAQ
C15_R RECODED: In the past 12 months have you been a victim of physical violence?	99.9	99.4
C16_R RECODED: To what extent do you agree or disagree with the following statement? People in my neighborhood are very supportive of each other.'	99.9	99.3
C17_R RECODED: How isolated and/or lonely do you feel?	99.8	99.6
C18_R RECODED: In the past 12 months do you believe you have personally experienced racism or gender bias?	91.2	98.4
C19_R RECODED: For each of the following 5 questions, please rate the extent you agree or disagree… I feel deprived when I think about what I have compared to what other people like me have.	99.8	99.1
C20_R RECODED: I feel privileged compared to other people like me.	99.8	99.1
C21_R RECODED: I feel resentful when I see how prosperous other people like me seem to be.	99.5	98.9
C22_R RECODED: When I compare what I have with what others like me have, I realize that I am quite well off.	99.3	99.1
C23_R RECODED: I feel dissatisfied with what I have compared to what other people like me have.	99.3	98.2
GA1_R RECODED: Which best describes your belief about the benefit or harm that gambling has for society?	99.0	97.6
GA3A_R RECODED: Which of the following best describes your opinion about legalized gambling?	98.9	98.1
GA4_R RECODED: Which of the following best describes your opinion about gambling opportunities in Massachusetts?	97.6	96.6
GA5_R RECODED: There have been 3 new casinos built in Massachusetts in the past few years. What sort of overall impact do you believe these have had? Would you say…	97.7	97.4
GA6A_R RECODED: What do you believe will be the single most positive impact for Massachusetts?	98.1	97.1
GA6B_R RECODED: What do you believe will be the single most negative impact for Massachusetts?	97.7	96.5
GY1A_R RECODED: In the past 12 months, how often have you purchased lottery tickets such as Megabucks, Powerball, or Lucky for Life?	99.9	99.5
GY2A_R RECODED: In the past 12 months, how often have you purchased instant tickets or pull tabs?	99.8	99.0
GY2C_R RECODED: In the past 12 months, how often have you purchased raffle tickets?	99.5	99.7
GY3A_R RECODED: In the past 12 months, how often have you purchased daily lottery games such as Mass Cash, All or Nothing, or Numbers Game?	99.6	98.3
GY5A_R RECODED: In the past 12 months, how often have you gone to a bingo hall to gamble?	99.7	99.3
GY7A_R RECODED: In the past 12 months, how many times have you gambled at a casino or slots parlor in Massachusetts ?	98.5	86.8
GY8A_R RECODED: In the past 12 months, how many times have you gambled at a casino, racino, or slots parlor outside of Massachusetts?	97.6	87.5

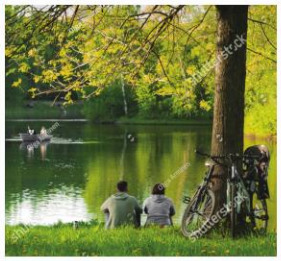
	Percent complete	
	WEB/phone	SAQ
GY9A_R RECODED: In the past 12 months, how often have you bet on a horse race at either a horse race track or an off-track site?	99.3	98.5
GY10A_R RECODED: In the past 12 months, how often have you gambled or bet money against other people on things such as card games; golf, pool, darts, bowling; video games; board games, or poker outside of a casino. Would you say…?	99.2	98.5
GY11A_R RECODED: In the past 12 months, how often did you purchase high risk stocks, options or futures or day trade on the stock market?	98.9	98.7
GY12A_R RECODED: In the past 12 months, have you gambled online?	99.3	98.3
GY14A_R RECODED: Has the COVID pandemic increased the amount of online gambling you have done in the past 12 months?	42.4	33.3
GY14B_R RECODED: What impact, if any, has the COVID pandemic had on your overall gambling behavior in the past 12 months?	95.7	91.1
GY14C_R RECODED: Have you used any money from your COVID stimulus check to gamble?	97.0	97.6
GY15_R RECODED: Has media promotion, targeted advertising, or news stories about gambling had any impact on your gambling behavior in the past 12 months?	95.8	91.5
GM1_R RECODED: What would you say is the main reason that you gamble?	94.1	72.2
GR1_R RECODED: How important is gambling to you as a recreational activity?	96.7	95.6
GY2A_R RECODED: In the past 12 months, how often have you purchased instant tickets or pull tabs?	99.8	99.0
PA1_R RECODED: In the past 12 months have you seen or heard any media campaigns to prevent problem gambling in Massachusetts?	98.7	97.9
PA2A_R RECODED: In the past 12 months have you been aware of any programs to prevent problem gambling (other than media campaigns) offered at your school, your place of work, in your community or elsewhere?	98.4	97.1
GPO1_R RECODED: What portion of your close friends and family members are regular gamblers?	98.5	97.0
GP1_R RECODED: Thinking about the past 12 months, have you bet more than you could really afford to lose?	98.7	84.9
GP2_R RECODED: Thinking about the past 12 months, have you felt guilty about the way you gamble or what happens when you gamble?	98.4	84.5
GP3_R RECODED: In the past 12 months, have you needed to gamble with larger amounts of money to get the same feeling of excitement?	98.2	84.5
GP4_R RECODED: In the past 12 months, when you gambled, did you go back another day to try to win back the money you lost?	97.9	84.1
GP5A_R RECODED: In the past 12 months, have you borrowed money or sold anything to get money to gamble?	98.2	84.1
GP5B_R RECODED: In the past 12 months, about how much money have you borrowed or obtained from selling possessions in order to gamble?	98.1	85.9

	Percent complete	
	WEB/phone	SAQ
GP6A_R RECODED: In the past 12 months, has your gambling caused any financial problems for you or your household?	98.1	84.3
GP6B_R RECODED: In the past 12 months, have you filed for bankruptcy because of gambling?	98.1	86.1
GP7A_R RECODED: In the past 12 months, has your gambling caused you any health problems, including stress or anxiety?	97.9	84.3
GP7B_R RECODED: In the past 12 months have these health problems caused you to seek medical or psychological help?	97.9	86.0
GP8_R RECODED: In the past 12 months, have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?	98.1	84.3
GP9_R RECODED: In the past 12 months, have you felt that you might have a problem with gambling?	98.3	84.5
GP10A_R RECODED: Has your involvement in gambling caused significant mental stress in the form of guilt, anxiety, or depression for you or someone close to you in the past 12 months?	98.1	84.5
GP10B_R RECODED: In the past 12 months, have you thought of committing suicide because of gambling?	98.1	86.0
GP10C_R RECODED: In the past 12 months, have you attempted suicide because of gambling?	98.1	86.1
GP10D_R RECODED: Would you like to know about the free gambling and mental health treatment services in your local area?	98.1	88.2
GP11A_R RECODED: Has your involvement in gambling caused significant problems in your relationship with your spouse/partner or important friends or family in the past 12 months?	97.8	84.9
GP11B_R RECODED: In the past 12 months, has your involvement in gambling caused an instance of domestic violence in your household?	98.1	86.1
GP11C_R RECODED: In the past 12 months, has your involvement in gambling resulted in separation or divorce?	98.2	86.1
GP12A_R RECODED: In the past 12 months, has your involvement in gambling caused you to repeatedly neglect your children or family?	98.0	85.0
GP12B_R RECODED: In the past 12 months, has child welfare services become involved because of your gambling?	98.1	86.1
GP13A_R RECODED: Has your involvement in gambling caused significant work or school problems for you or someone close to you in the past 12 months or caused you to miss a significant amount of time of	97.9	85.0
GP13B_R RECODED: In the past 12 months, about how many work or school days have you lost due to gambling?	98.1	86.0
GP13C_R RECODED: In the past 12 months, have you lost your job or had to quit school due to gambling?	98.1	86.0
GP13D_R RECODED: In the past 12 months, did anyone in this household receive public assistance or other welfare payments as a result of losing your job because of gambling?	98.1	86.1
GP13E_R RECODED: Roughly how much money did you receive from public assistance in the past 12 months?	98.1	86.1

	Percent complete	
	WEB/phone	SAQ
GP14A_R RECODED: In the past 12 months, has your involvement in gambling caused you or someone close to you to write bad checks, take money that didn't belong to you or commit other illegal acts to support your gambling?	97.8	84.8
GP14B_R RECODED: In the past 12 months, about how much money have you illegally obtained in order to gamble?	97.8	86.1
GP14C_R RECODED: In the past 12 months, has your gambling been a factor in your committing a crime for which you have been arrested?	97.8	86.1
GP14D_R RECODED: Were you convicted for this crime?	97.8	86.1
GP14G_R RECODED: Were you incarcerated for this crime?	97.8	86.1
GP14H_R RECODED: For how many days were you incarcerated?	97.8	86.1
GP15_R RECODED: In the past 12 months, have you often gambled longer, with more money or more frequently than you intended to?	97.9	84.5
GP16A_R RECODED: In the past 12 months, have you made attempts to either cut down, control or stop gambling?	97.2	84.0
GP16B_R RECODED: Were you successful in these attempts to cut down, control or stop gambling?	97.1	86.1
GP17_R RECODED: In the past 12 months, is there anyone else who would say that you had difficulty controlling your gambling, regardless of whether you agreed with them or not?	97.4	84.0
GP18_R RECODED: In the past 12 months, would you say you have been preoccupied with gambling?	97.7	84.3
GP19_R RECODED: In the past 12 months, when you did try cutting down or stopping did you find you were very restless or irritable or that you had strong cravings for it?	97.1	83.7
GP20_R RECODED: In the past 12 months, did you find you needed to gamble with larger and larger amounts of money to achieve the same level of excitement?	96.8	84.3
GP21_R RECODED: Are there particular types of gambling that have contributed to your problems more than others?	98.9	83.8
GP23A_R RECODED: Have you wanted help for gambling problems in the past 12 months?	98.9	83.8
GP23B_R RECODED: Have you sought help for gambling problems in the past 12 months?	98.9	83.8
GP23E_R RECODED: Have you excluded yourself from any casino or slots parlor in the past 12 months?	98.9	83.9
GP24_R RECODED: Have you had problems with gambling in your lifetime prior to the past 12 months?	98.9	83.8
Canadian Problem Gambling Index	99.0	83.9
D4_R RECODED: At present are you…?	91.4	97.4
D5_R RECODED: How many children under 18 years old live in your household?	88.6	94.0
D5A_R RECODED: What is the total number of people who live in your household?	87.3	96.2

	Percent complete	
	WEB/phone	SAQ
D6_R RECODED: What is the highest degree or level of school you have completed?	93.2	96.9
D7A_R RECODED: Are you currently...?	91.9	97.1
D7B_R RECODED: Have you ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard?	93.5	96.8
D9_RBC RECODED AND BACKCODED: Do you own the place where you currently live, pay rent or something else?	90.3	96.8
D11_R RECODED: During the last 12 months, was there a time when you were not able to pay your mortgage, rent, or utility bills?	96.3	97.0
D12_R RECODED: Were you born in the United States?	92.4	97.0
D12b_R RECODED: In the last 12 months, how many times have you moved from one home to another?	96.0	94.5
D13_R RECODED: Are you Hispanic or Latino?	91.6	95.7
Age (based on 2022-year of birth)	88.9	95.8
Alcohol use (3 categories)	99.9	98.9
Current tobacco use	99.8	96.8
Education (6 categories)	93.2	96.9
Employment (6 categories)	91.9	97.1
Household income (6 categories)	74.4	90.5
Marital status (5 categories)	91.4	97.4
ethnicity1	88.6	95.9

Appendix C: Survey Questionnaire



Massachusetts Survey of Health and Recreation

UMASS AMHERST

Please have the adult in your household (18 years or older) who had the most recent birthday complete this survey. We do not mean the oldest person. We mean the person who had a birthday last.

If you would prefer to complete this survey online, please go to: https://mahealth.norc.org

Your unique survey Personal Identification Number (PIN) is: XXXXX.

Instructions for Completing the Booklet

This booklet contains several types of questions. Each question should be answered only about yourself, not anyone else in your household.

- **For some questions, you answer the question by marking a box, like this:**
  1 ☒ Yes
  2 ☐ No
- **For some questions, you answer the question by filling in one number per box, like this:**
  0 9 *Number of Days*
- **You will sometimes be instructed to skip one or more questions. In this example, if your choice is 'No', you skip to question 10; otherwise, you continue to the next question.**
  1 ☐ Yes
  2 ☒ No → **GO TO 10**
- **This survey asks many questions about gambling as a recreational activity. We would like you to participate even if you have never gambled. It is important that we collect information that is representative of the state of Massachusetts.**

Definitions

For the purposes of this survey, please refer to the definitions below for the following terms.

- **"Non-medical" drug use means using it to get high or experience pleasurable effects, see what the effects are like, or use with friends.**
- **"Serious" means something that either you or someone else would say is considerable, important, or major, either because of its frequency or significance.**
- **A high risk stock is a stock from a company that has a real risk of going out of business and/or having their stock price double or triple in value in the next year.**
- **An "underground" casino is a place with unlicensed slot machines or casino game tables.**

The University of Massachusetts is conducting a study about health and recreational behavior in Massachusetts. This survey is private and confidential. We have a Federal Certificate of Confidentiality that is designed to protect the confidentiality of your research data from a court order or subpoena. We can provide you with more information if you would like. Taking part is up to you. You don't have to answer any question you don't want to, and you can stop at any time. Almost everyone will be able to finish the survey within 10 to 15 minutes.

If you have questions about the Federal Certificate of Confidentiality, please visit: http://grants.nih.gov/grants/policy/coc/faqs.htm#187

Health Section

We would like to start by asking you questions about your health.

1. Are you male, female or other gender?

1 ☐ Male
2 ☐ Female
3 ☐ Other

2. In what year were you born?

☐☐☐☐

3. Which of the following is your preferred recreational activity? Would you say…

1 ☐ Watching TV
2 ☐ Walking or hiking
3 ☐ Gardening
4 ☐ Reading
5 ☐ Socializing with friends or family
6 ☐ Traveling
7 ☐ Gambling
91 ☐ Other

4. Over the past 12 months, would you say that in general your health has been…?

1 ☐ Excellent
2 ☐ Very good
3 ☐ Good
4 ☐ Fair
5 ☐ Poor

5. In the past 12 months, how would you rate your overall level of stress? Would you say…?

1 ☐ Very high
2 ☐ High
3 ☐ Moderate
4 ☐ Low
5 ☐ Very low

6. In the past 12 months, how would you rate your overall level of happiness? Would you say…?

1 ☐ Very high
2 ☐ High
3 ☐ Moderate
4 ☐ Low
5 ☐ Very low

7. Have you smoked at least 100 cigarettes in your entire life?

1 ☐ Yes
2 ☐ No → **GO TO 9**

8. Do you now smoke cigarettes every day, some days, or not at all?

1 ☐ Every day
2 ☐ Some days
3 ☐ Not at all

9. Do you currently smoke cigars, pipe tobacco, or hookah tobacco (shisha); or use dipping tobacco (including snus), chewing tobacco, or snuff…

1 ☐ Every day
2 ☐ Some days
3 ☐ Not at all

10. Do you now use e-cigarettes or other electronic "vaping" products every day, some days, or not at all?

1 ☐ Every day
2 ☐ Some days
3 ☐ Not at all

11. Have you used alcohol in the past 12 months?

1 ☐ Yes
2 ☐ No → **GO TO 15 ON PAGE 2**

12. During the past 30 days, how many days per week or per month did you have at least one drink of any alcohol beverage such as beer, wine, a malt beverage or liquor? *Please enter the number of days per week or days per month.*

☐ *Days per Week*

or

☐☐ *Days per Month*

13. **One drink is equivalent to a 12-ounce beer, a 5-ounce glass of wine, or a drink with one shot of liquor. During the past 30 days, on the days when you drank, about how many drinks did you drink on average?**

☐☐ *Number of Drinks*

14. **Considering all types of alcoholic beverages, how many times during the past 30 days did you have:**

If you are male: 5 or more drinks on an occasion?

☐☐ *Number of Times*

If you are female: 4 or more drinks on an occasion?

☐☐ *Number of Times*

15. **In the past 12 months have you used any marijuana, hallucinogens (such as LSD, mushrooms, or PCP), cocaine, heroin, fentanyl, opiates, or any other drugs not intended for medical use?** *If you are not sure what is considered non-medical drug use, please refer to the definitions on the inside cover.*

1 ☐ Yes
2 ☐ No

16. **How often have you used cannabis (e.g., marijuana, hashish, hash oil, CBD oil, etc.) in the past 12 months?**

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all

17. **What type of cannabis product did you use (check all that apply)**

1 ☐ Marijuana
2 ☐ Hashish
3 ☐ Hash oil
4 ☐ Cannabidiol (CBD) Oil
5 ☐ Shatter
6 ☐ Tincture
7 ☐ Edibles
91 ☐ Other

18. **Have you had any problems with drugs or alcohol in the past 12 months? By this we mean difficulties in controlling their use that have led to negative consequences for you or other people.**

1 ☐ Yes
2 ☐ No → **GO TO 20**

19. **During the past 12 months, have you sought help for your use of alcohol or drugs?**

1 ☐ Yes
2 ☐ No

20. **Have you had any problems with other behavior in the past 12 months such as overeating, sex or pornography, shopping, exercise, Internet chat lines, or other things? What we mean is difficulties controlling the behavior which has led to significant negative consequences for you or other people.**

1 ☐ Yes
2 ☐ No

21. **In the past 30 days, have you had any serious problems with depression, anxiety or other mental health problems?** *If you are not sure what is considered serious, please refer to the definitions on the inside cover.*

1 ☐ Yes → **GO TO 23**
2 ☐ No

22. **How about in the last 12 months?**

1 ☐ Yes
2 ☐ No → **GO TO 24 ON PAGE 3**

23. **Which problems have you experienced?**

If you would like information regarding treatment resources, please see page 15 for contact information.

24. Do you now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed, or a special telephone?

1 ☐ Yes
2 ☐ No

25. To what extent do you agree or disagree with the following statement: "I consider my neighborhood to be safe from crime." Would you say… ?

1 ☐ Strongly agree
2 ☐ Agree
3 ☐ Neutral
4 ☐ Disagree
5 ☐ Strongly disagree

26. In the past 12 months, have you been a victim of physical violence?

1 ☐ Yes
2 ☐ No

27. To what extent do you agree or disagree with the following statement: "People in my neighborhood are very supportive of each other."

1 ☐ Strongly agree
2 ☐ Agree
3 ☐ Neutral
4 ☐ Disagree
5 ☐ Strongly disagree

28. How isolated and/or lonely do you feel?

1 ☐ Not at all isolated or lonely
2 ☐ Somewhat isolated or lonely
3 ☐ Very isolated or lonely

29. In the past 12 months, do you believe you have personally experienced racism or gender bias?

1 ☐ Yes, both racism and gender bias
2 ☐ Yes, racism
3 ☐ Yes, gender bias
4 ☐ No

For each of the following 5 questions, please rate the extent you agree or disagree…

30. I feel deprived when I think about what I have compared to what other people like me have.

1 ☐ Strongly disagree
2 ☐ Disagree
3 ☐ Slightly disagree
4 ☐ Neutral
5 ☐ Slightly agree
6 ☐ Agree
7 ☐ Strongly agree

31. I feel privileged compared to other people like me.

1 ☐ Strongly agree
2 ☐ Agree
3 ☐ Slightly agree
4 ☐ Neutral
5 ☐ Slightly disagree
6 ☐ Disagree
7 ☐ Strongly disagree

32. I feel resentful when I see how prosperous other people like me seem to be.

1 ☐ Strongly disagree
2 ☐ Disagree
3 ☐ Slightly disagree
4 ☐ Neutral
5 ☐ Slightly agree
6 ☐ Agree
7 ☐ Strongly agree

33. When I compare what I have with what others like me have, I realize that I am quite well off.

1 ☐ Strongly agree
2 ☐ Agree
3 ☐ Slightly agree
4 ☐ Neutral
5 ☐ Slightly disagree
6 ☐ Disagree
7 ☐ Strongly disagree

34. I feel dissatisfied with what I have compared to what other people like me have.

1 ☐ Strongly disagree
2 ☐ Disagree
3 ☐ Slightly disagree
4 ☐ Neutral
5 ☐ Slightly agree
6 ☐ Agree
7 ☐ Strongly agree

Recreation Questions

The primary recreational activity we have chosen to ask you about is gambling.

We define gambling as betting money or material goods on an event with an uncertain outcome in the hopes of winning additional money or material goods. It includes things such as lottery tickets, scratch tickets, bingo, betting against a friend on a game of skill or chance, betting on horse racing or sports, investing in high risk stocks, etc.

35. Which best describes your belief about the benefit or harm that gambling has for society? Would you say...?

1 ☐ The harm far outweighs the benefits
2 ☐ The harm somewhat outweighs the benefits
3 ☐ The benefits are about equal to the harm
4 ☐ The benefits somewhat outweigh the harm
5 ☐ The benefits far outweigh the harm

36. Which of the following best describes your opinion about *legalized* gambling? Would you say…?

1 ☐ All types of gambling should be legal
2 ☐ Some types of gambling should be legal and some should be illegal
3 ☐ All types of gambling should be illegal

37. Which of the following best describes your opinion about gambling opportunities in Massachusetts? Would you say…?

1 ☐ Gambling is too widely available
2 ☐ Gambling is not available enough
3 ☐ The current availability of gambling is fine

38. There have been 3 new casinos built in Massachusetts in the past few years. What sort of overall impact do you believe these may have had? Would you say…?

1 ☐ Very beneficial
2 ☐ Somewhat beneficial
3 ☐ Neither beneficial nor harmful
4 ☐ Somewhat harmful
5 ☐ Very harmful

39. What do you believe will be the single most positive impact for Massachusetts? Would you say…?

1 ☐ Employment
2 ☐ Benefit to other local businesses
3 ☐ Increased government revenue
4 ☐ Retaining money that was leaving Massachusetts
5 ☐ Increased local leisure options (i.e., the ability to gamble locally)
6 ☐ No positive impacts
91 ☐ Other

40. What do you believe has been the single most negative impact for Massachusetts? Would you say…

1 ☐ Increased gambling addiction (and associated consequences: bankruptcy, suicide, divorce, etc.)
2 ☐ Negative impact on other local businesses
3 ☐ Increased crime
4 ☐ Increased traffic congestion
5 ☐ No negative impacts
91 ☐ Other

Past Gambling Behaviors

Now, we would like you to think about different times that you have gambled in the past year.

41. In the past 12 months, how often have you purchased *lottery tickets* such as MegaMillions, Powerball, or Lucky for Life? *This does not include daily lottery games (e.g., Mass Cash, Numbers Game, Keno, All or Nothing) or instant tickets, pull tabs, or raffle tickets.*
Would you say… ?

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 43**

42. Roughly how much money do you spend on lottery tickets in a typical month? Spend means how much you are ahead (+$) or behind (–$), or your net win or loss in an average month in the past 12 months.

☐ $ ☐☐☐,☐☐☐

43. In the past 12 months, how often have you purchased *instant tickets or pull tabs?* Would you say…?

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 45**

44. Roughly how much money do you spend on instant tickets or pull tabs in a typical month?

☐ $ ☐☐☐,☐☐☐

45. In the past 12 months, how often have you purchased *raffle tickets?* Would you say…?

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 47**

46. Roughly how much money do you spend on raffle tickets in a typical month?

☐ $ ☐☐☐,☐☐☐

47. In the past 12 months, how often have you purchased *daily lottery games* such as Mass Cash, All or Nothing, or Numbers Game? Would you say…?

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 49 ON PAGE 6**

48. Roughly how much money do you spend on daily lottery games in a typical month?

☐ $ ☐☐☐,☐☐☐

49. In the past 12 months, how often have you bet money or gambled on *sports* (this includes social betting, online betting, fantasy sports, and esports)? Would you say…?

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 53**

50. Roughly how much money do you spend on sports betting in a typical month?

☐ $ ☐☐☐,☐☐☐

51. What type of sports betting did you engage in? (check all that apply)

1 ☐ Betting on professional sporting events (i.e., football, basketball, baseball, hockey, boxing, mixed martial arts, motor racing, horse racing, e-sports (professional video game competitions))
2 ☐ Sports pools/lotteries (i.e., betting on the outcomes of several different professional sporting matches)
3 ☐ Fantasy sports betting
4 ☐ Betting on sports that you participated in yourself (e.g., golf, pool, bowling, darts, foosball)

52. Where and how did you bet on sports? *A sportsbook is a venue where someone can place a bet on a sporting event. A bookmaker or a bookie is an organization or person that takes bets on sporting events.* **(check all that apply)**

1 ☐ Office sports pools or social betting against friends or family
2 ☐ Placing bets with a legal land-based sportsbook outside of Massachusetts
3 ☐ Placing bets with a legal land-based sportsbook within Massachusetts
4 ☐ Placing bets with an illegal/ underground land-based sportsbook or bookmaker in Massachusetts
5 ☐ Placing bets on sporting events with an online sportsbook outside of Massachusetts
6 ☐ Placing bets on sporting events with an online sportsbook within Massachusetts

53. In the past 12 months, how often have you gone to a *bingo hall* to gamble? Would you say…?

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 55**

54. Roughly how much money do you spend at bingo halls in a typical month?

– $ ☐, ☐☐☐, ☐☐☐

55. In the past 12 months, how many times have you gambled at a *casino or slots parlor in Massachusetts?*

☐☐☐ *Times* → **IF ZERO, GO TO 59**

56. Roughly how much money do you spend on gambling <u>per visit</u> in Massachusetts casinos or slot parlors?

– $ ☐, ☐☐☐, ☐☐☐

57. Roughly how much money do you spend on nongambling activities (such as food, travel, lodging, entertainment) per visit at Massachusetts casinos or slot parlors?

$ ☐☐, ☐☐☐

58. Which specific casino, racino, or slots parlor do you most often go to?

1 ☐ Plainridge Park Casino
2 ☐ MGM Springfield Casino
3 ☐ Encore Boston Harbor Casino

59. In the past 12 months, have you gambled at a *casino, racino or slot parlor outside Massachusetts*?

☐☐☐ *Times* → **IF ZERO, GO TO 63 ON PAGE 7**

60. Roughly how much money do you spend on gambling <u>per visit</u> in out of state casinos, racinos, slot parlors and slots at racetracks?

– $ ☐, ☐☐☐, ☐☐☐

61. Roughly how much money do you spend on nongambling activities (such as food, travel, lodging, entertainment) per visit in out of state casinos, racinos, slot parlors and slots at racetracks?

$ ☐☐, ☐☐☐

62. Which state do you most often go to for this out-of-state gambling?

1 ☐ Connecticut
2 ☐ Rhode Island
3 ☐ New Jersey
4 ☐ New York
5 ☐ Pennsylvania
6 ☐ Maine
7 ☐ Nevada
8 ☐ Other

63. In the past 12 months, how often have you spent money on *electronic gambling machines* (i.e. slot machines, video lottery terminals, electronic casino table games) either in person at a casino or online? Would you say…?

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 65**

64. Roughly how much money do you spend on electronic gambling machines in a typical month?

– $ ☐, ☐☐☐, ☐☐☐

65. In the past 12 months how often have you bet money on any *casino table game* such as poker, blackjack, baccarat, roulette, craps, mah-jong, sic-bo, pai gow, either in person at a casino or online? (This does not include automated electronic versions of these games, which should be reported in the question about electronic gambling machines).

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 69**

66. Roughly how much money do you spend on casino table games in a typical month?

– $ ☐, ☐☐☐, ☐☐☐

67. Has casino gambling decreased your spending on other things in the past year?

1 ☐ Yes
2 ☐ No

68. How much less money do you estimate you are spending on other things in the past year because of casino gambling?

– $ ☐, ☐☐☐, ☐☐☐

69. In the past 12 months, how often have you bet on a *horse race* at either a horse race track or an off-track site? Would you say…?

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 72**

70. Roughly how much money do you spend on horse racing in a typical month?

– $ ☐, ☐☐☐, ☐☐☐

71. Where do you most often go to bet on horse racing?

1 ☐ Suffolk Downs
2 ☐ Plainridge Racecourse
3 ☐ Teletheatre/Off Track Betting
4 ☐ Other

72. In the past 12 months, how often have you gambled or *bet money against other people* on things such as card games; golf, pool, darts, bowling; video games; board games, or poker outside of a casino? Would you say…?
Poker played in a casino and games played on the internet should NOT be included.

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 74**

73. Roughly how much money do you spend gambling or *betting money against other people* in a typical month?

– $ ☐, ☐☐☐, ☐☐☐

74. In the past 12 months, how often did you purchase *high risk stocks, options or futures or day trade* on the stock market? Would you say…? *If you are not sure what a high risk stock is, please refer to the definitions on the inside cover.*

1 ☐ 4 or more times a week
2 ☐ 2-3 times a week
3 ☐ Once a week
4 ☐ 2-3 times a month
5 ☐ Once a month
6 ☐ Less than once a month
7 ☐ Not at all → **GO TO 76**

75. What do you estimate is your net loss or gain in a typical month from high risk stocks, options, futures, or day trading?

– $ ☐, ☐☐☐, ☐☐☐

76. In the past 12 months, have you *gambled online?* This would include things such as playing poker, buying lottery tickets, betting on sports, bingo, slots or casino table games for money or playing interactive games for money?

1 ☐ Yes
2 ☐ No → **GO TO 79**

77. Roughly how much money do you spend gambling online in a typical month?

– $ ☐, ☐☐☐, ☐☐☐

78. What is the main type of online gambling you engage in?

1 ☐ Lotto draw games
2 ☐ Instant win tickets
3 ☐ Bingo
4 ☐ Slot machines or other electronic gambling machines
5 ☐ Casino table games (i.e., blackjack, baccarat, roulette, craps, etc.)
6 ☐ Games against other people (e.g., poker, pool, etc.)
7 ☐ Horse race betting
8 ☐ Sports betting
9 ☐ High risk stocks, options, futures,or day trading.
91 ☐ Other

79. Has the COVID pandemic increased the amount of online gambling you have done in the past 12 months?

1 ☐ Yes
2 ☐ No

80. What impact, if any, has the COVID pandemic had on your overall gambling behavior in the past 12 months?

1 ☐ It has had no impact on my gambling
2 ☐ Overall, I have gambled less
3 ☐ Overall I have gambled more

81. Have you used any money from your COVID stimulus check to gamble?

1 ☐ Yes
2 ☐ No
3 ☐ I did not receive any stimulus money

82. Has media promotion, targeted advertising, or news stories about gambling had any impact on your gambling behavior in the past 12 months?

1 ☐ It has had no impact on my gambling
2 ☐ Overall, I have gambled less
3 ☐ Overall I have gambled more

83. Which specific things have caused you to gamble more? (check all that apply)

1 ☐ General news stories about casinos or gambling
2 ☐ General promotional advertising from the casino, lottery, or other gambling provider (billboards, TV/radio advertisements)
3 ☐ General promotional advertising from the New England Casino Association
4 ☐ Targeted promotion toward me (in my mail or email)

84. What would you say is the main reason that you gamble? Would you say…?

1 ☐ For excitement/entertainment
2 ☐ To win money
3 ☐ To escape or distract yourself
4 ☐ To socialize with family or friends
5 ☐ To support worthy causes
6 ☐ Because it makes you feel good about yourself
91 ☐ Other

85. How important is gambling to you as a recreational activity? Would you say…?

1 ☐ Very important
2 ☐ Somewhat important
3 ☐ Not very important
4 ☐ Not at all important

Prevention Awareness

We would now like you to think about what you have heard about gambling prevention either from the media or from others.

86. In the past 12 months have you seen or heard any media campaigns to prevent problem gambling in Massachusetts?

1 ☐ Yes
2 ☐ No

87. In the past 12 months have you been aware of any programs to prevent problem gambling (other than media campaigns) offered at your school, your place of work, in your community or elsewhere?

1 ☐ Yes
2 ☐ No

Gambling Problems-Others

88. What portion of your close friends and family members are regular gamblers? Would you say…

1 ☐ None of them
2 ☐ Some of them
1 ☐ Most of them
1 ☐ All of them

Gambling Problems-Self

When answering the questions throughout the remainder of the survey, please think about the past 12 months.

89. Thinking about the past 12 months, have you bet more than you could really afford to lose? Would you say...?

1 ☐ Never
2 ☐ Sometimes
3 ☐ Most of the time
4 ☐ Almost always

90. Thinking about the past 12 months, have you felt guilty about the way you gamble or what happens when you gamble? Would you say…?

1 ☐ Never
2 ☐ Sometimes
3 ☐ Most of the time
4 ☐ Almost always

91. In the past 12 months, have you needed to gamble with larger amounts of money to get the same feeling of excitement? Would you say…?

1 ☐ Never
2 ☐ Sometimes
3 ☐ Most of the time
4 ☐ Almost always

92. In the past 12 months, when you gambled, did you go back another day to try to win back the money you lost? Would you say…?

1 ☐ Never
2 ☐ Sometimes
3 ☐ Most of the time
4 ☐ Almost always

93. In the past 12 months, have you borrowed money or sold anything to get money to gamble? Would you say…?

1 ☐ Never → **GO TO 95**
2 ☐ Sometimes
3 ☐ Most of the time
4 ☐ Almost always

94. In the past 12 months, about how much money have you borrowed or obtained from selling possessions in order to gamble?

$ ☐☐,☐☐☐

95. In the past 12 months, has your gambling caused any financial problems for you or your household? Would you say…?

1 ☐ Never → **GO TO 97**
2 ☐ Sometimes
3 ☐ Most of the time
4 ☐ Almost always

96. In the past 12 months, have you filed for bankruptcy because of gambling?

1 ☐ Yes
2 ☐ No

97. In the past 12 months, has your gambling caused you any health problems, including stress or anxiety? Would you say…?

1 ☐ Never → **GO TO 99**
2 ☐ Sometimes
3 ☐ Most of the time
4 ☐ Almost always

98. In the past 12 months have these health problems caused you to seek medical or psychological help?

1 ☐ Yes
2 ☐ No

99. In the past 12 months, have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true? Would you say...?

1 ☐ Never
2 ☐ Sometimes
3 ☐ Most of the time
4 ☐ Almost always

100. In the past 12 months, have you felt that you might have a problem with gambling? Would you say...?

1 ☐ Never
2 ☐ Sometimes
3 ☐ Most of the time
4 ☐ Almost always

101. Has your involvement in gambling caused significant mental stress in the form of guilt, anxiety, or depression for you or someone close to you in the past 12 months?

1 ☐ Yes
2 ☐ No → **GO TO 105**

102. In the past 12 months, have you thought of committing suicide because of gambling?

1 ☐ Yes
2 ☐ No → **GO TO 105**

103. In the past 12 months, have you attempted suicide because of gambling?

1 ☐ Yes
2 ☐ No

104. Would you like to know about the free gambling and mental health treatment services in your local area?

1 ☐ Yes
2 ☐ No

If you would like information regarding treatment resources, please see page 15 for contact information.

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105. Has your involvement in gambling caused significant problems in your relationship with your spouse/partner or important friends or family in the past 12 months?

1 ☐ Yes
2 ☐ No → **GO TO 108**

106. In the past 12 months, has your involvement in gambling caused an instance of domestic violence in your household?

1 ☐ Yes
2 ☐ No

107. In the past 12 months, has your involvement in gambling resulted in separation or divorce?

1 ☐ Yes
2 ☐ No

108. In the past 12 months, has your involvement in gambling caused you to repeatedly neglect your children or family?

1 ☐ Yes
2 ☐ No → **GO TO 110**

109. In the past 12 months, has child welfare services become involved because of your gambling?

1 ☐ Yes
2 ☐ No

110. Has your involvement in gambling caused significant work or school problems for you or someone close to you in the past 12 months or caused you to miss a significant amount of time off work or school?

1 ☐ Yes
2 ☐ No → **GO TO 114**

111. In the past 12 months, about how many work or school days have you lost due to gambling?

☐☐☐ *Days*

112. In the past 12 months, have you lost your job or had to quit school due to gambling?

1 ☐ Yes
2 ☐ No → **GO TO 115**

113. In the past 12 months, did anyone in this household receive any public assistance (food stamps, Temporary Assistance for Needy Families (TANF)) or any other welfare payments from the state or local welfare office as a result of losing your job because of gambling?

1 ☐ Yes
2 ☐ No → **GO TO 115**

114. Roughly how much money did you receive from public assistance in the past 12 months?

$☐☐,☐☐☐

115. In the past 12 months, has your involvement in gambling caused you or someone close to you to write bad checks, take money that didn't belong to you or commit other illegal acts to support your gambling?

1 ☐ Yes
2 ☐ No → **GO TO 121 ON PAGE 12**

116. In the past 12 months, about how much money have you illegally obtained in order to gamble?

$☐☐,☐☐☐

117. In the past 12 months, has your gambling been a factor in your committing a crime for which you have been arrested?

1 ☐ Yes
2 ☐ No → **GO TO 122 ON PAGE 12**

118. Were you convicted for this crime?

1 ☐ Yes
2 ☐ No → **GO TO 122 ON PAGE 12**

119. What was the offense?

☐

120. Were you incarcerated for this crime?

1 ☐ Yes
2 ☐ No → **GO TO 122**

121. For how many days were you incarcerated?

☐☐☐ *Days*

122. In the past 12 months, have you often gambled longer, with more money or more frequently than you intended to?

1 ☐ Yes
2 ☐ No

123. In the past 12 months, have you made attempts to either cut down, control or stop gambling?

1 ☐ Yes
2 ☐ No → **GO TO 125**

124. Were you successful in these attempts to cut down, control or stop gambling?

1 ☐ Yes
2 ☐ No

125. In the past 12 months, is there anyone else who would say that you had difficulty controlling your gambling, regardless of whether you agreed with them or not?

1 ☐ Yes
2 ☐ No

126. In the past 12 months, would you say you have been preoccupied with gambling?

1 ☐ Yes
2 ☐ No

127. In the past 12 months, when you did try cutting down or stopping did you find you were very restless or irritable or that you had strong cravings for it?

1 ☐ Yes
2 ☐ No

128. In the past 12 months, did you find you needed to gamble with larger and larger amounts of money to achieve the same level of excitement?

1 ☐ Yes
2 ☐ No

129. Are there particular types of gambling that have contributed to your problems more than others?

1 ☐ Yes
2 ☐ No → **GO TO 131**

130. Which types of gambling have contributed to your problems?

1 ☐ Lottery
2 ☐ Instant ticket
3 ☐ Keno
4 ☐ Bingo
5 ☐ Slot machines
6 ☐ Video poker machines
7 ☐ Casino table games (i.e., blackjack, baccarat, roulette, craps, etc.)
8 ☐ Poker
9 ☐ Horse racing
10 ☐ Dog racing
11 ☐ Sports betting
12 ☐ High risk stocks, options, futures, or day trading
13 ☐ Online gambling
14 ☐ Other

131. Have you *wanted* help for gambling problems in the past 12 months?

1 ☐ Yes
2 ☐ No → **GO TO 134 ON PAGE 13**

132. Have you *sought* help for gambling problems in the past 12 months?

1 ☐ Yes
2 ☐ No → **GO TO 134 ON PAGE 13**

133. Where did you seek help from?

1 ☐ Friends or family
2 ☐ Gamblers anonymous
3 ☐ Gam-Anon (this is a support group for friends/family of problem gamblers)
4 ☐ Family doctor
5 ☐ Private psychologist/psychiatrist/ counselor
6 ☐ Problem gambling treatment center/ clinic
7 ☐ Pastor/minister/priest/etc.
8 ☐ Telephone help/hotline
9 ☐ Online help
10 ☐ Other

134. Have you excluded yourself from any casino or slots parlor in the past 12 months?

1 ☐ Yes
2 ☐ No → **GO TO 136**

135. In which state?

1 ☐ Connecticut
2 ☐ Rhode Island
3 ☐ New Jersey
4 ☐ New York
5 ☐ Pennsylvania
6 ☐ Maine
7 ☐ Nevada
8 ☐ Other

136. Have you had problems with gambling in your lifetime prior to the past 12 months?

1 ☐ Yes
2 ☐ No

Household Demographics

The last few questions are about your background so we can keep track of the characteristics of people who respond to the survey.

137. At present are you...?

1 ☐ Married
2 ☐ Living with your partner
3 ☐ Separated, but still legally married
4 ☐ Divorced
5 ☐ Widowed
6 ☐ Never been married

138. How many children under 18 years old live in your household?

☐☐ *Number of Children*

139. What is the total number of people who live in your household?

☐☐ *Number of People in Household*

140. What is the highest degree or level of school you have completed?

1 ☐ Never attended school or only attended kindergarten
2 ☐ Grades 1 through 8
3 ☐ Grades 9 through 11
4 ☐ Regular high school diploma or GED
5 ☐ Some college credit, but less than 1 year of college credit
6 ☐ 1 or more years of college credit, no degree
7 ☐ Associate degree
8 ☐ Bachelor's degree
9 ☐ Master's degree
10 ☐ Professional degree beyond a bachelor's degree
11 ☐ Doctorate degree

141. Are you currently...?

1 ☐ Employed for wages
2 ☐ Self-employed
3 ☐ Out of work for more than 1 year
4 ☐ Out of work for less than 1 year
5 ☐ A homemaker
6 ☐ A student
7 ☐ Retired
8 ☐ Unable to work

142. Have you ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard? *Active duty does not include training for the Reserves or National Guard, but does include activation, for example, for the Persian Gulf War.*

1 ☐ Yes, now on active duty
2 ☐ Yes, on active duty in the past, but not during the last 12 months
3 ☐ No, training for Reserves or National Guard only
4 ☐ No, never served in the military.

143. Do you own the place where you currently live, pay rent or something else?

1 ☐ Own
2 ☐ Rent
91 ☐ Something else

144. Is your approximate annual household income from all sources...

1 ☐ Less than $15,000
2 ☐ $15,000 - $29,999
3 ☐ $30,000 - $49,999
4 ☐ $50,000 - $69,999
5 ☐ $70,000 - $99,999
6 ☐ $100,000 - $124,999
7 ☐ $125,000 - $149,999
8 ☐ $150,000 or more

145. During the last 12 months, was there a time when you were not able to pay your mortgage, rent or utility bills?

1 ☐ Yes
2 ☐ No

146. Were you born in the United States?

1 ☐ Yes
2 ☐ No

147. In the last 12 months, how many times have you moved from one home to another?

☐ *Number of moves the last 12 months*

148. Are you Hispanic or Latino?

1 ☐ Yes
2 ☐ No

149. Which one or more of the following would you say is your race?
Check all that apply.

1 ☐ White or Caucasian
2 ☐ Black or African American
3 ☐ Asian
4 ☐ Native Hawaiian or Other Pacific Islander
5 ☐ Native American or Alaskan Native
91 ☐ Some other race

150. To document who completed the survey from your household, please enter your first and last name.

First Name

Last Name

151. Please enter your email address.

152. What is the best phone number to reach you if we have more questions about your household? *This number will only be used to contact you about this study. We are prohibited from sharing, distributing, or selling your information to anyone outside of this project.*

☐☐☐-☐☐☐-☐☐☐☐

You have reached the end of the survey. Thank you for your participation! You may be re-contacted in the future to participate in related studies. If you are contacted to participate in future surveys, you have the right to refuse. Thank you on behalf of the University of Massachusetts for the time and effort you've spent answering these questions. If you have any questions about this survey, you may contact Rachel Volberg at 413-545-6700.

Thank you again.

If you would like information regarding treatment resources, please contact:

Massachusetts Substance Abuse Information and Education Helpline
800-327-5050
TTY: 617-536-5872

Drug & Alcohol Treatment Hotline
800-662-HELP

National Alliance on Mental Illness
1-800-950-6264

Samaritans
877-870-4673

National Suicide Prevention Lifeline
1-800-273-8255
TTY: 1-800-799-4889

Because we are interested in how opinions change over time, we may be contacting you in the future. To help us contact you, please provide the name and contact information for three people who are likely to know where you can be reached. Do not include someone who lives in your household.

Contact #1

Name

Address

Phone

Email

Contact #2

Name

Address

Phone

Email

Contact #3

Name

Address

Phone

Email

Please return your completed questionnaire using the enclosed pre-paid envelope to:

Massachusetts Survey of Health and Recreation
c/o NORC at the University of Chicago
55 E. Monroe Street, 19th Floor
Chicago, IL 60603

If you have misplaced the pre-paid envelope, please call 1-877-324-4716 for a new one.

NORC at the University of Chicago is conducting this study on behalf of the University of Massachusetts Amherst. If you have questions or would prefer to complete the survey by phone, please call NORC toll-free at 1-877-324-4716.

If you have questions about your rights as a study participant, you may call the NORC Institutional Review Board toll-free, at 1-866-309-0542.

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Initials	Date	Initials	Date	Initials	Date	Initials	Date

A_SEIGMA_SAQ_English_2021_V1.indd
MJK:2021-06-25

Appendix D: Attitudes

Table 55. Opinions about legalized gambling in Massachusetts

					All should be illegal		Some should be legal and some should be illegal		All should be legal		
		Unweighted N[1]	Weighted N	% missing	%[3]	95% CI	%[4]	95% CI	%[4]	95% CI	p-value
Overall		6,209	5,549,009		9.9	(8.8, 11.2)	67.5	(65.5, 69.4)	22.6	(20.9, 24.4)	
	Missing	84	73,900	1%							
Gender											<0.0001
	Male	2,519	2,574,767		8.9	(7.3, 10.7)	62.1	(59.0, 65.2)	29.0	(26.1, 32.0)	
	Female	3,553	2,863,717		10.7	(9.1, 12.5)	72.4	(70.0, 74.8)	16.9	(15.0, 19.0)	
	Other	39	40,549			NSF	53.6	(31.5, 74.4)		NSF	
	Missing	98	69,976	1%							
Age											<0.0001
	18-20	104	155,710			NSF	79.9	(67.0, 88.7)		NSF	
	21-24	258	363,663		9.6	(5.5, 16.1)	82.5	(74.7, 88.4)		NSF	
	25-34	984	953,757		8.5	(6.0, 11.9)	70.7	(65.6, 75.3)	20.8	(16.8, 25.6)	
	35-54	1,822	1,500,664		9.9	(7.9, 12.3)	62.9	(59.0, 66.7)	27.2	(23.6, 31.0)	
	55-64	970	977,687		8.5	(6.0, 11.8)	65.1	(60.1, 69.8)	26.4	(22.1, 31.2)	
	65-79	1,188	870,177		13.2	(10.5, 16.5)	64.1	(59.9, 68.2)	22.6	(19.2, 26.5)	
	80+	305	280,507			NSF	67.6	(58.7, 75.4)	23.1	(16.4, 31.4)	
	Missing	578	446,844	9%							
Ethnicity											<0.0001
	Hispanic	843	584,323		18.8	(14.2, 24.5)	62.4	(56.4, 68.0)	18.8	(14.7, 23.7)	
	Black	623	376,128		13.1	(9.2, 18.2)	65.3	(57.6, 72.3)	21.6	(15.6, 29.1)	
	White	3,218	3,706,273		7.0	(5.8, 8.4)	68.4	(65.9, 70.8)	24.6	(22.4, 27.0)	
	Asian	884	392,754		17.0	(13.2, 21.6)	72.8	(67.7, 77.3)	10.3	(7.6, 13.7)	
	Other	51	46,383			NSF	36.5	(20.0, 56.9)	47.6	(26.5, 69.6)	
	Missing	590	443,147	9%							
Education											<0.0001
	Less than high school	183	299,677		22.4	(14.7, 32.7)	60.7	(49.9, 70.6)	16.8	(10.3, 26.2)	
	HS or GED	616	1,246,861		10.7	(7.9, 14.5)	60.3	(54.6, 65.6)	29.0	(24.1, 34.5)	
	Some college	1,375	1,076,559		8.8	(6.8, 11.3)	70.6	(66.8, 74.0)	20.7	(17.7, 24.0)	
	BA	1,640	1,578,641		7.1	(5.6, 9.0)	68.1	(64.7, 71.4)	24.7	(21.7, 28.0)	
	MS or professional degree	1,577	848,255		9.6	(7.9, 11.7)	72.9	(69.7, 75.9)	17.5	(14.9, 20.3)	
	PHD	461	241,429		9.5	(6.4, 13.7)	76.2	(69.8, 81.6)	14.3	(9.9, 20.3)	
	Missing	357	257,589	5%							
Employment											0.0011

					All should be illegal		Some should be legal and some should be illegal		All should be legal		
		Unweighted N[1]	Weighted N	% missing	%[3]	95% CI	%[4]	95% CI	%[4]	95% CI	p-value
	1=employed	3,595	3,230,462		8.7	(7.4, 10.3)	67.9	(65.4, 70.4)	23.3	(21.1, 25.7)	
	2=unemployed	205	196,878		14.0	(7.8, 23.8)	57.8	(45.6, 69.1)	28.2	(17.9, 41.4)	
	3=homemaker	131	125,213			NSF	64.7	(51.1, 76.2)	18.1	(10.5, 29.5)	
	4=student	384	423,008		8.1	(5.4, 11.9)	80.6	(73.9, 86.0)	11.3	(7.0, 17.8)	
	5=retired	1,242	1,022,898		10.3	(8.0, 13.3)	66.5	(62.3, 70.4)	23.1	(19.6, 27.0)	
	6=disabled	236	229,187		16.6	(9.3, 27.9)	50.6	(39.3, 61.9)	32.8	(22.5, 45.0)	
	Missing	416	321,362	6%							
Income											0.0019
	1=Less than $15,000	445	447,808		17.5	(12.2, 24.5)	55.2	(47.1, 63.1)	27.3	(20.4, 35.4)	
	2=$15,000-<$30,000	475	474,350		13.3	(9.1, 19.1)	65.4	(58.1, 72.1)	21.3	(15.8, 28.1)	
	3=$30,000-<$50,000	627	566,488		10.3	(6.7, 15.5)	69.9	(63.1, 75.9)	19.8	(14.7, 26.1)	
	4=$50,000-<$100,000	1,347	1,169,414		9.6	(7.3, 12.5)	65.2	(60.7, 69.6)	25.2	(21.2, 29.7)	
	5=$100,000-<$150,000	877	772,564		5.6	(4.1, 7.6)	69.0	(64.3, 73.4)	25.3	(21.2, 30.0)	
	6=$150,000 and more	1,100	991,762		7.8	(5.8, 10.5)	66.5	(62.0, 70.7)	25.7	(21.8, 30.1)	
	Missing	1,338	1,126,621	25%							
Marital status											0.0010
	1=Never married	1,512	1,356,884		7.8	(5.8, 10.4)	72.0	(67.7, 75.8)	20.2	(16.8, 24.2)	
	2=Living with partner	533	547,072		4.6	(2.8, 7.3)	69.8	(63.4, 75.5)	25.6	(20.2, 32.0)	
	3=Married	2,716	2,514,997		10.4	(8.8, 12.3)	65.4	(62.5, 68.1)	24.2	(21.7, 26.9)	
	4=Divorced or Separated	668	499,432		10.4	(6.9, 15.4)	66.3	(59.4, 72.5)	23.4	(17.9, 29.9)	
	5=Widowed	342	302,257		14.9	(9.8, 22.1)	66.1	(57.9, 73.5)	18.9	(13.3, 26.3)	
	Missing	438	328,367	6%							
Military status											0.0006
	Yes, now on active duty	18	20,889		0.0	NA	93.2	(77.7, 98.2)		NSF	
	Yes, on active duty in the past	278	299,324		5.3	(3.4, 8.3)	66.7	(58.3, 74.2)	28.0	(20.9, 36.3)	

					All should be illegal		Some should be legal and some should be illegal		All should be legal		
		Unweighted N[1]	Weighted N	% missing	%[3]	95% CI	%[4]	95% CI	%[4]	95% CI	p-value
	No, training for Reserves or National Guard only	78	82,860			NSF	53.5	(35.4, 70.7)	42.9	(25.7, 62.0)	
	No, never served in the military	5,493	4,885,826		10.1	(8.9, 11.4)	68.0	(65.9, 70.0)	21.9	(20.1, 23.8)	
	Missing	342	260,110	5%							

Unweighted N refers to the total number of respondents who selected this category for this question
Weighted N is the total number of respondents who selected this category for this question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
The % missing is calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 56. Beliefs about gambling availability in Massachusetts

					Too widely available		Current availability is fine		Not available enough		
		Unweighted N	Weighted N	% missing	%	95% CI	%	95% CI	%	95% CI	p-value
Overall		6127	5,493,705		67.5	(65.6, 69.4)	11.8	(10.5, 13.4)	20.6	(19.1, 22.2)	
	Missing	166	129,204	2%							
Gender											<0.0001
	Male	2496	2,565,657		62.3	(59.2, 65.4)	18.4	(15.9, 21.2)	19.3	(16.9, 21.8)	
	Female	3497	2,818,909		72.1	(69.7, 74.4)	6.1	(4.8, 7.7)	21.8	(19.8, 24.0)	
	Other	39	40,549		71.2	(47.2, 87.2)		NSF		NSF	
	Missing	95	68,590	1%							
Age											<0.0001
	18-20	103	153,055		82.6	(69.8, 90.6)		NSF	11.3	(6.4, 19.1)	
	21-24	257	363,056		72.4	(62.9, 80.2)		NSF	17.9	(11.9, 25.9)	
	25-34	974	954,545		65.4	(60.2, 70.2)	15.6	(11.9, 20.0)	19.1	(15.4, 23.4)	
	35-54	1808	1,490,173		63.4	(59.5, 67.1)	16.4	(13.4, 19.9)	20.2	(17.3, 23.4)	
	55-64	955	968,457		70.7	(65.9, 75.0)	10.2	(7.4, 14.0)	19.1	(15.6, 23.2)	
	65-79	1174	861,849		67.5	(63.4, 71.3)	6.5	(4.6, 9.2)	26.0	(22.5, 29.8)	
	80+	291	265,555		66.5	(57.8, 74.3)		NSF	28.1	(21.1, 36.4)	
	Missing	565	437,014	9%							
Ethnicity											<0.0001
	Hispanic	829	576,977		63.0	(57.2, 68.4)	13.0	(9.2, 18.0)	24.1	(19.7, 29.0)	
	Black	613	371,565		66.6	(58.7, 73.7)	10.1	(5.8, 17.1)	23.3	(17.4, 30.3)	
	White	3184	3,681,267		68.0	(65.5, 70.4)	13.0	(11.2, 15.0)	19.0	(17.1, 21.1)	
	Asian	873	383,874		73.4	(68.5, 77.8)	5.6	(3.8, 8.1)	21.0	(16.9, 25.7)	
	Other	50	44,608		50.4	(28.7, 71.9)		NSF	45.7	(24.4, 68.6)	
	Missing	578	435,414	9%							
Education											<0.0001
	Less than high school	173	283,765		54.7	(43.6, 65.3)	14.2	(7.8, 24.5)	31.1	(22.1, 41.8)	
	HS or GED	612	1,234,262		70.9	(65.5, 75.7)	12.2	(8.7, 16.8)	16.9	(13.3, 21.3)	
	Some college	1363	1,074,511		68.1	(64.1, 71.8)	9.3	(7.1, 12.0)	22.6	(19.3, 26.3)	

		Unweighted N	Weighted N	% missing	Too widely available %	95% CI	Current availability is fine %	95% CI	Not available enough %	95% CI	p-value
	BA	1629	1,576,553		66.2	(62.7, 69.5)	15.9	(13.2, 19.1)	17.9	(15.5, 20.6)	
	MS or professional degree	1550	836,317		68.5	(65.1, 71.7)	7.3	(5.6, 9.5)	24.2	(21.3, 27.4)	
	PHD	448	235,396		70.3	(62.7, 77.0)	9.8	(5.9, 15.9)	19.9	(14.3, 27.0)	
	Missing	352	252,900	5%							
Employment											<0.0001
	1=employed	3565	3,213,720		67.6	(65.0, 70.0)	14.2	(12.3, 16.5)	18.2	(16.3, 20.2)	
	2=unemployed	201	197,553		58.2	(45.7, 69.7)	7.3	(4.0, 12.8)	34.6	(23.4, 47.8)	
	3=homemaker	132	125,192		74.5	(63.4, 83.2)		NSF	19.4	(12.0, 29.9)	
	4=student	376	417,389		72.0	(63.7, 79.0)		NSF	19.0	(13.6, 26.1)	
	5=retired	1222	1,006,611		68.6	(64.6, 72.3)	6.0	(4.2, 8.5)	25.4	(22.1, 29.1)	
	6=disabled	230	223,842		60.1	(48.4, 70.7)	16.1	(9.1, 26.8)	23.9	(15.6, 34.7)	
	Missing	401	309,398	6%							
Income											0.0018
	1=Less than $15,000	434	442,141		60.8	(52.7, 68.4)	9.8	(6.4, 14.7)	29.4	(22.5, 37.4)	
	2=$15,000-<$30,000	469	467,694		59.9	(52.3, 67.0)	14.2	(9.1, 21.6)	25.9	(20.2, 32.6)	
	3=$30,000-<$50,000	620	563,210		68.5	(61.7, 74.6)	12.2	(7.8, 18.5)	19.3	(14.8, 24.8)	
	4=$50,000-<$100,000	1330	1,155,318		71.1	(66.9, 75.0)	9.8	(7.2, 13.2)	19.1	(16.0, 22.6)	
	5=$100,000-<$150,000	867	766,988		69.0	(64.1, 73.6)	15.9	(12.0, 20.7)	15.1	(12.3, 18.4)	
	6=$150,000 and more	1094	994,561		64.1	(59.4, 68.5)	16.3	(12.8, 20.6)	19.6	(16.2, 23.6)	
	Missing	1313	1,103,793	25%							
Marital status											<0.0001
	1=Never married	1501	1,357,947		72.5	(68.4, 76.3)	9.2	(6.9, 12.1)	18.3	(15.1, 22.0)	
	2=Living with partner	530	549,636		71.3	(64.8, 77.1)	13.8	(9.2, 20.2)	14.9	(11.3, 19.4)	
	3=Married	2683	2,489,297		65.4	(62.6, 68.2)	14.1	(11.9, 16.6)	20.5	(18.4, 22.7)	
	4=Divorced or Separated	649	480,420		63.5	(56.5, 69.9)	10.5	(6.4, 16.6)	26.1	(20.5, 32.5)	
	5=Widowed	337	299,376		68.7	(60.5, 75.9)		NSF	26.6	(19.8, 34.8)	
	Missing	427	317,029	6%							

		Unweighted N	Weighted N	% missing	Too widely available %	95% CI	Current availability is fine %	95% CI	Not available enough %	95% CI	p-value
Military status											0.1594
	Yes, now on active duty	18	20,889		85.9	(50.0, 97.4)	0.0	NA		NSF	
	Yes, on active duty in the past	274	295,234		66.0	(57.3, 73.8)	10.6	(6.4, 17.0)	23.4	(16.8, 31.6)	
	No, training for Reserves or National Guard only	76	80,897		58.5	(39.4, 75.3)		NSF		NSF	
	No, never served in the military	5421	4,838,347		68.3	(66.2, 70.3)	11.7	(10.2, 13.4)	20.0	(18.4, 21.7)	
	Missing	338	258,338	5%							

Unweighted N refers to the total number of respondents who selected this category for this question
Weighted N is the total number of respondents who selected this category for this question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
The % missing is calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 57. Perceived impact of expanded gambling in Massachusetts

					Harmful		Neither beneficial nor harmful		Beneficial		
		Unweighted N	Weighted N	% missing	%	95% CI	%	95% CI	%	95% CI	p-value
Overall		6143	5,502,803		25.1	(23.4, 26.8)	45.8	(43.8, 47.8)	29.1	(27.3, 31.0)	
	Missing	150	120,106	2%		.		.		.	
Gender											0.0003
	Male	2502	2,566,075		23.8	(21.3, 26.5)	42.8	(39.7, 46.0)	33.4	(30.4, 36.5)	
	Female	3506	2,827,276		25.6	(23.4, 27.9)	48.5	(45.8, 51.1)	26.0	(23.7, 28.4)	
	Other	39	40,549		50.9	(29.1, 72.3)	39.7	(20.2, 63.1)		NSF	
	Missing	96	68,903	1%		.		.		.	
Age											0.0002
	18-20	104	155,844		35.6	(23.6, 49.7)	48.5	(35.0, 62.3)		NSF	
	21-24	256	362,949		23.1	(15.9, 32.2)	52.7	(42.8, 62.3)	24.3	(16.5, 34.2)	
	25-34	978	955,904		23.5	(19.6, 27.9)	52.7	(47.6, 57.9)	23.7	(19.6, 28.5)	
	35-54	1811	1,495,883		25.9	(22.7, 29.5)	42.3	(38.6, 46.1)	31.8	(28.2, 35.5)	
	55-64	952	958,353		20.1	(16.8, 23.9)	42.2	(37.3, 47.3)	37.7	(32.8, 42.8)	
	65-79	1173	856,672		29.0	(25.4, 32.9)	42.4	(38.2, 46.7)	28.6	(24.8, 32.8)	
	80+	299	276,464		25.5	(19.1, 33.1)	48.7	(40.2, 57.3)	25.8	(19.3, 33.5)	
	Missing	570	440,735	9%		.		.		.	
Ethnicity											0.0005
	Hispanic	840	584,325		27.0	(21.8, 32.8)	42.4	(36.7, 48.3)	30.6	(25.7, 36.1)	
	Black	619	374,250		24.0	(18.3, 30.9)	41.5	(34.0, 49.3)	34.5	(27.1, 42.8)	
	White	3177	3,677,223		23.2	(21.2, 25.3)	46.4	(43.8, 49.0)	30.4	(28.0, 32.9)	
	Asian	872	383,811		31.0	(26.1, 36.4)	49.8	(44.3, 55.4)	19.1	(14.7, 24.4)	
	Other	50	46,209		48.5	(27.5, 70.1)		NSF		NSF	
	Missing	585	436,985	9%		.		.		.	
Education											<0.0001
	Less than high school	179	291,513		28.3	(19.9, 38.7)	45.4	(34.8, 56.4)	26.3	(18.1, 36.5)	

		Unweighted N	Weighted N	% missing	Harmful %	Harmful 95% CI	Neither beneficial nor harmful %	Neither beneficial nor harmful 95% CI	Beneficial %	Beneficial 95% CI	p-value
	HS or GED	614	1,240,595		20.5	(16.4, 25.2)	42.1	(36.7, 47.7)	37.4	(32.1, 43.1)	
	Some college	1364	1,072,059		22.4	(19.2, 26.1)	46.4	(42.4, 50.5)	31.2	(27.7, 34.9)	
	BA	1629	1,572,206		24.7	(21.8, 27.8)	47.4	(43.9, 51.0)	27.9	(24.7, 31.2)	
	MS or professional degree	1546	830,587		31.3	(28.2, 34.7)	45.9	(42.3, 49.4)	22.8	(20.0, 25.9)	
	PHD	454	238,332		32.1	(25.8, 39.2)	51.4	(44.2, 58.5)	16.5	(11.9, 22.4)	
	Missing	357	257,512	5%		.		.		.	
Employment											0.0183
	employed	3562	3,205,939		23.8	(21.7, 26.1)	46.1	(43.5, 48.8)	30.0	(27.6, 32.6)	
	unemployed	202	199,241		25.4	(16.5, 37.0)	44.4	(33.0, 56.4)	30.2	(20.3, 42.3)	
	homemaker	131	124,936		34.1	(23.6, 46.4)	41.8	(29.9, 54.7)	24.1	(14.9, 36.6)	
	student	379	423,208		29.3	(22.4, 37.3)	52.6	(44.2, 60.8)	18.1	(12.3, 25.9)	
	retired	1226	1,011,332		27.0	(23.7, 30.6)	43.0	(38.9, 47.2)	30.1	(26.3, 34.1)	
	disabled	230	219,816		17.0	(10.6, 26.1)	41.1	(30.1, 53.0)	41.9	(31.0, 53.7)	
	Missing	413	318,332	6%							
Income											0.3871
	1=Less than $15,000	434	437,405		27.8	(21.5, 35.2)	40.0	(32.1, 48.5)	32.1	(25.2, 40.0)	
	2=$15,000-<$30,000	474	469,631		24.5	(18.8, 31.3)	40.4	(33.6, 47.7)	35.1	(28.1, 42.8)	
	3=$30,000-<$50,000	619	563,594		22.4	(17.6, 28.0)	46.6	(39.9, 53.3)	31.1	(25.3, 37.5)	
	4=$50,000-<$100,000	1336	1,161,798		23.8	(20.3, 27.6)	48.0	(43.5, 52.6)	28.2	(24.3, 32.5)	
	5=$100,000-<$150,000	868	767,609		22.8	(19.1, 27.0)	41.8	(36.9, 46.9)	35.4	(30.5, 40.6)	
	6=$150,000 and more	1088	987,334		26.3	(22.4, 30.6)	45.6	(41.1, 50.1)	28.2	(24.1, 32.6)	

		Unweighted N	Weighted N	% missing	Harmful %	Harmful 95% CI	Neither beneficial nor harmful %	Neither beneficial nor harmful 95% CI	Beneficial %	Beneficial 95% CI	p-value
	Missing	1324	1,115,433	25%							
Marital status											0.0148
	1=Never married	1497	1,356,240		22.3	(18.9, 26.2)	51.3	(46.8, 55.8)	26.4	(22.6, 30.5)	
	2=Living with partner	531	550,119		19.6	(15.1, 25.0)	45.0	(38.4, 51.8)	35.4	(29.0, 42.3)	
	3=Married	2693	2,490,640		26.9	(24.5, 29.5)	43.4	(40.6, 46.2)	29.7	(27.1, 32.5)	
	4=Divorced or Separated	651	482,759		29.2	(23.5, 35.6)	39.0	(32.6, 45.8)	31.9	(25.7, 38.7)	
	5=Widowed	337	299,307		22.6	(16.6, 29.9)	48.5	(40.5, 56.5)	29.0	(22.4, 36.6)	
	Missing	434	323,738	6%							
Military status											0.0920
	Yes, now on active duty	18	20,889			NSF	65.1	(33.9, 87.2)		NSF	
	Yes, on active duty in the past, but not during the last 12 months	276	298,038		26.0	(19.0, 34.4)	36.3	(28.5, 44.9)	37.7	(29.5, 46.7)	
	No, training for Reserves or National Guard only	78	82,860			NSF	32.5	(18.7, 50.2)	45.4	(28.6, 63.4)	
	No, never served in the military	5427	4,839,834		24.8	(23.0, 26.7)	46.6	(44.5, 48.8)	28.6	(26.6, 30.6)	
	Missing	344	261,183	5%							

Unweighted N refers to the total number of respondents who selected this category for this question
Weighted N is the total number of respondents who selected this category for this question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
The % missing is calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 58. Positive impacts of gambling in Massachusetts

	Unweighted N	Weighted N	%	95% CI
Employment	2,379	2,020,009	36.7	(34.8, 38.7)
Benefit to other local businesses	480	455,772	8.3	(7.2, 9.5)
Increased government revenue	918	787,731	14.3	(13.0, 15.7)
Retaining money that was leaving Massachusetts	955	950,183	17.3	(15.8, 18.9)
Increased local leisure options (i.e., the ability to gamble locally)	341	321,160	5.8	(4.9, 6.9)
No positive impacts	755	693,358	12.6	(11.3, 14.1)
Other	330	273,882	5.0	(4.2, 5.9)

Unweighted N refers to the total number of respondents who selected this category for this question
Weighted N is the total number of respondents who selected this category for this question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N

Table 59. Negative impacts of gambling in Massachusetts

	Unweighted N	Weighted N	%	95% CI
Increased gambling addiction (and associated consequences: bankruptcy, suicide, divorce, etc.)	2,731	2,468,126	45.1	(43.0, 47.1)
Negative impact on other local businesses	369	357,055	6.5	(5.5, 7.7)
Increased crime	707	583,804	10.7	(9.5, 12.0)
Increased traffic congestion	1,194	1,031,529	18.8	(17.3, 20.4)
No negative impacts	652	644,555	11.8	(10.5, 13.2)
Other	477	393,333	7.2	(6.2, 8.3)

Unweighted N refers to the total number of respondents who selected this category for this question
Weighted N is the total number of respondents who selected this category for this question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N

Appendix E: Gambling in Massachusetts

Appendix E1: Gambling expenditure data

As noted several times in this report, gambling expenditure is an important measure of gambling participation. Expenditure data are useful in illustrating the relative importance of different gambling activities to the population, how much money individuals spend on different gambling activities, and the proportion of gambling expenditures and revenues derived from recreational, at-risk, and problem gamblers. The following table (Table 60) presents total reported expenditures for each of the gambling activities included in the survey along with totals for all lottery games and all gambling.

Table 60. Reported expenditures on different gambling activities in the past year

		Expenditures $million	% of total
All gambling		$3,803	100.0%
All lottery		$1,582	41.6%
All casinos		$810	21.3%
Sports	*	$624	16.4%
Raffles	*	$364	9.6%
Private	*	$170	4.5%
Online	*	$144	3.8%
Bingo	*	$45	1.2%
Horse racing	*	$45	1.2%

Reported in millions of dollars

* Estimate is unreliable, relative standard error > 30%

Although all of the data obtained in gambling surveys are based on self-report, expenditure data is the only area where objective information is available to assess the accuracy of these reports. Research has shown that there are substantial challenges in obtaining accurate expenditure information from survey respondents. In fact, every study that has included questions about spending on gambling, including the BGPS and the FGPS, has found a substantial mismatch with known spending based on reports to government agencies (Volberg et al., 2001; Williams & Wood, 2007; Wood & Williams, 2007).

Household expenditure surveys have consistently obtained significant underestimates of actual gambling expenditure. For example, in Australia, gambling expenditure totals in the 1998–1999 Household Expenditure Survey were only 17% of actual gambling revenues (Australian Bureau of Statistics, 2000). In New Zealand, people reported spending $103 per person on gambling, compared to $280 per person in actual revenue (Statistics New Zealand, 1999). In 2001, Canadians reported spending $267 on gambling per *household* in the Survey of Household Spending, compared to an average of $447 per *person* in actual revenue (Statistics Canada, 2003). Average Alberta household gambling expenditure in the 2008 Survey of Household Spending was $363 compared to approximately $2,000 in actual per household revenue.

Jurisdiction-wide prevalence surveys of gambling have obtained expenditure totals that are both above and below actual revenues. In Washington State, Volberg, Moore, Christiansen, Cummings, and Banks (1998) found that reported losses were two to ten times higher than actual revenues, depending on the type of gambling. In a

study of Canadian provinces by Williams and Wood (2004), self-reported expenditures were 2.1 times higher than actual provincial gaming revenues in that time period. In contrast, Australian and New Zealand studies have found self-reported expenditures to be between half and three-quarters of actual revenues (Abbott & Volberg, 2000; Productivity Commission, 1999). In a national survey of U.S. adults, gamblers reported being *ahead* or winning $3 billion at casinos in the past year instead of having *lost* more than $20 billion, the actual total revenues reported by the casino industry. Gamblers also reported being ahead $2 billion at the racetrack and being ahead $4 billion in private wagering. Only when it came to lotteries did they admit to a loss of $5 billion (Gerstein et al., 1999).

There are several possible reasons for the lack of correspondence between reported expenditures and actual revenues. One concerns the nature of the question being asked. Many gambling surveys have asked people: "How much do you *spend* on gambling?" A problem with the word "spend" is that some people interpret it to mean how much money they have wagered in total rather than their net win/loss, and other people include their travel and meal costs (Blaszczynski et al., 1997). Paradoxically, studies using clearer non-biased question wordings have obtained some of the most discrepant results. The U.S. national study (Gerstein et al., 1999) asked respondents whether they had "come out ahead or behind on your gambling" with the choices being "ahead, behind, or broke even." With this wording, a majority of people actually reported *winning* rather than losing money in the past year. It appears that when given the choice to represent themselves as either a "winner" or "loser," many people choose to misrepresent themselves as winners or to minimize their actual losses.

The importance of question wording was explored in research conducted by Wood and Williams (2007) in which Ontario adult gamblers were asked about past-month gambling expenditure in one of 12 different ways. The relative validity of each question format was subsequently established on the basis of the correspondence of reported gambling expenditures with amounts recorded by respondents in weekly diaries as well as actual Ontario gambling revenues. One important finding from this study was that slight variations in question wording resulted in significant variation in reported expenditure amounts. Another important finding was that there were some question wordings that had better correspondence to the amounts recorded in diaries as well as jurisdictional revenue. The question wording with the best evidence of validity was actually the traditional question that asked about "*spending*." Although this question wording generally results in a good match between *overall* reported gambling expenditures and *overall* jurisdictional revenues, the match with revenues by specific type of gambling is not as good (Williams, Belanger, et al., 2011).

Another possible reason for the lack of correspondence between reported expenditures and actual revenues relates to the characteristics of different gambling activities. Little attention has been paid to the features of different gambling activities and their likely impact on reports of spending elicited from survey respondents. For example, games differ in their proportion of winners and losers. Traditional large jackpot lottery games are characterized by a small number of very large prizes while instant lottery games include numerous "winning" experiences with most prizes limited to one to four times the price of the ticket. Gambling activities also differ in their speed of play with some games (e.g., slot machines) characterized by a rapid cycle of play and others (e.g., casino table games) often characterized by slower, more interactive play. These variations have quite different implications for both the chances of accurately reflecting the distribution of winners and losers in a survey and for the accurate recall or calculation of wins and losses by survey respondents. In general, researchers have found that lotteries are associated with the most accurate self-reports of spending because players are reporting on behavior that is consistent in both frequency and amount spent. As games depart from this formula, with transfers occurring among smaller groups and in more particularistic and irregular ways, the tendency for large wins to be salient (and thus average winnings to be over-estimated) and large losses to be neglected or

minimized (and thus average losses under-estimated) becomes greater and the fit between estimated expenditures and known consumer spending becomes poorer (Volberg et al., 2001).

Finally, a substantial fraction of gambling revenues, particularly from casino table games and some parimutuel betting pools, has historically been derived from a very small number of “high-rollers.” It is difficult to account for the amount of money that these individuals put into play using survey methods because such individuals are unlikely to be included, even in very large samples of the population (Volberg et al., 2001).

Despite these limitations, self-reported expenditure data provide a valuable lens into the relative importance of different gambling activities in different jurisdictions, the proportion of gambling expenditures accounted for by recreational, at-risk, and problem gamblers, and the degree to which people exaggerate wins or minimize losses.

Appendix E2: Gambling Participation Data

Table 61. Percentage of past-year gambling participation by gambling activity

	BOPS		FOPS		OPS23	
	%	95% CI	%	95% CI	%	95% CI
All gambling	79.2	(77.9, 80.5)	77.9	(76.1, 79.6)	81.4	(79.8, 82.9)
All lottery	74.5	(73.1, 75.9)	68.6	(66.7, 70.5)	72.4	(70.6, 74.1)
Traditional	70.9	(69.4, 72.4)	64.3	(62.3, 66.2)	68.0	(66.1, 69.9)
Instant games	51.3	(49.6, 53.0)	46.6	(44.6, 48.7)	49.9	(47.8, 51.9)
Daily games	18.2	(17.0, 19.4)	36.8	(34.8, 38.8)	42.6	(40.6, 44.7)
Raffles	39.5	(37.4, 41.6)	26.2	(24.4, 28.0)	34.8	(32.9, 36.7)
Casino	32.7	(31.1, 34.3)	.		.	
EGM	.		22.5	(20.8, 24.3)	28.8	(27.0, 30.7)
Table games	.		16.3	(14.8, 17.9)	22.3	(20.7, 23.9)
Sports betting	13.0	(12.0, 14.1)	23.2	(21.5, 25.0)	29.8	(28.0, 31.7)
Private wagering	15.3	(14.2, 16.5)	18.0	(16.5, 19.7)	23.4	(21.8, 25.0)
Horse racing	6.1	(5.4, 6.9)	10.1	(8.9, 11.5)	17.7	(16.3, 19.2)
Bingo	9.4	(8.3, 10.7)	18.5	(16.9, 20.2)	27.8	(26.0, 29.6)
Online	6.3	(5.6, 7.1)	14.8	(13.4, 16.3)	21.0	(19.5, 22.7)

Percentages and 95% CI are calculated using the weighted Ns

Table 62. Any lottery by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		6,258	5,586,636	47.6	(45.6, 49.6)	
Gender						0.0014
	Male	2,535	2,593,907	51.2	(48.1, 54.4)	
	Female	3,585	2,881,380	45.0	(42.5, 47.6)	
	Other	39	40,549		NSF	
Age						<0.0001
	1=18-20	105	156,355		NSF	
	2=21-24	258	357,554	24.6	(17.2, 33.9)	
	3=25-34	989	958,937	33.8	(29.0, 39.0)	
	4=35-54	1,834	1,515,693	51.6	(47.8, 55.4)	
	5=55-64	976	979,924	61.4	(56.6, 66.0)	
	6=65-79	1,202	881,214	54.6	(50.4, 58.8)	
	7=80+	305	278,470	45.1	(36.7, 53.8)	
Ethnicity						<0.0001
	Hispanic	845	587,347	45.1	(39.4, 51.0)	
	Black	629	382,638	46.0	(38.4, 53.9)	
	White	3,240	3,724,878	49.8	(47.2, 52.3)	
	Asian	886	392,064	32.1	(27.2, 37.5)	
	Other	52	48,048	60.2	(39.6, 77.7)	
Education						<0.0001
	Less than high school	183	297,988	47.0	(36.5, 57.7)	
	HS or GED	623	1,250,777	54.6	(49.0, 60.0)	
	Some college	1,386	1,085,108	53.5	(49.5, 57.5)	
	BA	1,646	1,589,298	43.5	(40.1, 47.0)	
	MS or professional degree	1,586	854,430	41.0	(37.6, 44.5)	
	PHD	463	242,294	27.0	(21.4, 33.5)	
Employment						<0.0001
	1=employed	3,616	3,244,579	48.2	(45.6, 50.9)	
	2=unemployed	206	201,353	59.7	(47.7, 70.7)	
	3=homemaker	134	127,720	36.6	(25.7, 49.0)	
	4=student	385	426,304	23.0	(16.7, 30.7)	
	5=retired	1,254	1,029,855	52.4	(48.2, 56.4)	
	6=disabled	235	226,444	51.6	(40.2, 62.9)	
Income						0.2157
	1=Less than $15,000	443	443,048	42.8	(35.1, 50.9)	
	2=$15,000-<$30,000	482	473,788	52.2	(44.9, 59.3)	
	3=$30,000-<$50,000	630	569,111	49.5	(42.8, 56.1)	
	4=$50,000-<$100,000	1,350	1,174,145	50.6	(46.1, 55.0)	
	5=$100,000-<$150,000	880	772,204	49.9	(44.8, 54.9)	
	6=$150,000 and more	1,106	1,003,585	44.5	(40.0, 49.0)	
Marital status						0.0004
	1=Never married	1,519	1,367,160	39.8	(35.5, 44.2)	
	2=Living with partner	536	547,548	45.4	(38.9, 52.1)	
	3=Married	2,733	2,530,070	51.0	(48.2, 53.9)	
	4=Divorced or Separated	672	500,649	52.9	(46.2, 59.5)	

		Unweighted N	Weighted N	%	95% CI	p-value
	5=Widowed	347	304,694	49.1	(41.2, 57.0)	
Military status						0.0028
	Yes, now on active duty	18	20,889	61.7	(28.4, 86.7)	
	Yes, on active duty in the past, but not during the last 12 months	283	299,593	61.7	(53.2, 69.5)	
	No, training for Reserves or National Guard only	77	81,861	62.6	(46.0, 76.7)	
	No, never served in the military	5,525	4,918,293	46.3	(44.2, 48.5)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 63. Traditional lottery by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		2,604	5,606,730	43.3	(41.3, 45.3)	
Gender						0.0007
	Male	1,138	2,598,120	47.3	(44.2, 50.5)	
	Female	1,428	2,897,261	40.2	(37.7, 42.8)	
	Other	8	40,549		NSF	
Age						<0.0001
	1=18-20	18	156,355		NSF	
	2=21-24	53	358,217	19.1	(12.9, 27.2)	
	3=25-34	269	955,296	29.9	(25.2, 35.0)	
	4=35-54	818	1,519,868	47.7	(43.9, 51.5)	
	5=55-64	505	985,830	57.0	(52.1, 61.8)	
	6=65-79	591	888,185	51.4	(47.1, 55.6)	
	7=80+	116	283,878	36.9	(29.0, 45.5)	
Ethnicity						<0.0001
	Hispanic	351	592,609	41.3	(35.7, 47.1)	
	Black	298	385,941	39.0	(31.9, 46.6)	
	White	1,404	3,733,704	45.4	(42.9, 48.0)	
	Asian	277	393,195	30.8	(26.0, 36.1)	
	Other	23	48,048	50.3	(29.6, 70.8)	
Education						<0.0001
	Less than high school	78	303,820	42.7	(32.7, 53.4)	
	HS or GED	286	1,260,313	48.1	(42.6, 53.7)	
	Some college	695	1,082,611	49.7	(45.7, 53.8)	
	BA	685	1,592,333	40.0	(36.6, 43.4)	
	MS or professional degree	576	856,759	37.7	(34.3, 41.1)	
	PHD	119	242,294	25.0	(19.6, 31.2)	
Employment						<0.0001
	1=employed	1,494	3,246,304	44.2	(41.6, 46.9)	
	2=unemployed	97	204,402	50.3	(38.7, 61.8)	
	3=homemaker	44	127,372	33.7	(23.2, 46.2)	
	4=student	79	426,678	18.6	(13.4, 25.3)	
	5=retired	596	1,040,758	48.3	(44.2, 52.4)	
	6=disabled	108	229,147	46.6	(35.5, 58.0)	
Income						0.1785
	1=Less than $15,000	158	451,957	36.4	(29.1, 44.3)	
	2=$15,000-<$30,000	222	470,304	44.3	(37.2, 51.6)	
	3=$30,000-<$50,000	276	575,840	44.6	(38.1, 51.3)	
	4=$50,000-<$100,000	602	1,175,773	47.1	(42.7, 51.6)	
	5=$100,000-<$150,000	393	773,364	46.1	(41.1, 51.2)	
	6=$150,000 and more	429	1,005,561	41.4	(37.0, 45.9)	
Marital status						<0.0001
	1=Never married	532	1,374,200	34.2	(30.2, 38.5)	
	2=Living with partner	206	547,994	40.7	(34.3, 47.5)	
	3=Married	1,189	2,539,171	47.7	(44.9, 50.6)	
	4=Divorced or Separated	335	499,320	49.2	(42.6, 55.9)	
	5=Widowed	146	307,843	41.6	(34.0, 49.7)	

		Unweighted N	Weighted N	%	95% CI	p-value
Military status						0.0272
	Yes, now on active duty	10	20,889	61.7	(28.4, 86.7)	
	Yes, on active duty in the past, but not during the last 12 months	152	301,843	55.8	(47.2, 64.1)	
	No, training for Reserves or National Guard only	34	82,860	43.2	(26.6, 61.6)	
	No, never served in the military	2,242	4,933,451	42.3	(40.2, 44.5)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 64. Instant tickets by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		6,268	5,589,556	26.6	(24.8, 28.4)	
Gender						0.0281
	Male	2,534	2,592,123	29.2	(26.3, 32.2)	
	Female	3,595	2,885,833	24.7	(22.5, 27.0)	
	Other	39	40,549		NSF	
Age						<0.0001
	1=18-20	105	156,355		NSF	
	2=21-24	259	358,002		NSF	
	3=25-34	987	954,793	14.5	(11.1, 18.8)	
	4=35-54	1,835	1,518,195	31.0	(27.5, 34.8)	
	5=55-64	976	980,242	35.1	(30.5, 40.1)	
	6=65-79	1,205	881,304	32.7	(28.8, 36.9)	
	7=80+	308	281,514	27.2	(19.8, 36.1)	
Ethnicity						<0.0001
	Hispanic	849	589,491	30.8	(25.6, 36.7)	
	Black	631	385,653	33.5	(26.4, 41.5)	
	White	3,245	3,721,231	26.6	(24.4, 29.0)	
	Asian	885	391,185	16.6	(12.5, 21.6)	
	Other	52	48,048	43.4	(23.0, 66.2)	
Education						<0.0001
	Less than high school	186	301,116	36.3	(26.6, 47.1)	
	HS or GED	622	1,249,239	35.6	(30.4, 41.1)	
	Some college	1,385	1,080,064	34.2	(30.6, 38.0)	
	BA	1,649	1,591,059	19.5	(17.0, 22.2)	
	MS or professional degree	1,591	856,583	18.7	(16.1, 21.6)	
	PHD	463	242,294	8.1	(5.1, 12.7)	
Employment						<0.0001
	1=employed	850	3,244,292	25.9	(23.6, 28.4)	
	2=unemployed	68	204,402	34.6	(24.9, 45.9)	
	3=homemaker	26	127,720	15.7	(9.6, 24.5)	
	4=student	30	424,644	11.2	(6.3, 19.0)	
	5=retired	374	1,033,651	30.0	(26.4, 33.9)	
	6=disabled	85	222,178	42.0	(31.1, 53.8)	
Income						<0.0001
	1=Less than $15,000	128	444,773	31.1	(24.4, 38.8)	
	2=$15,000-<$30,000	164	469,842	35.9	(29.1, 43.4)	
	3=$30,000-<$50,000	192	569,961	30.5	(24.7, 37.0)	
	4=$50,000-<$100,000	369	1,174,868	31.0	(26.9, 35.4)	
	5=$100,000-<$150,000	216	770,371	24.1	(20.1, 28.6)	
	6=$150,000 and more	203	1,005,385	19.7	(16.3, 23.7)	
Marital status						0.0166
	1=Never married	323	1,370,705	22.3	(18.7, 26.2)	
	2=Living with partner	124	548,121	24.2	(19.0, 30.2)	
	3=Married	684	2,532,308	27.8	(25.2, 30.5)	
	4=Divorced or Separated	213	499,146	34.5	(28.3, 41.3)	
	5=Widowed	91	300,474	28.2	(21.3, 36.3)	

		Unweighted N	Weighted N	%	95% CI	p-value
Military status						0.4057
	Yes, now on active duty	8	20,889		NSF	
	Yes, on active duty in the past, but not during the last 12 months	88	299,593	27.6	(20.6, 35.8)	
	No, training for Reserves or National Guard only	25	82,860	40.2	(23.7, 59.3)	
	No, never served in the military	1,336	4,918,267	26.2	(24.4, 28.2)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 65. Daily lottery by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		6,258	5,600,830	14.5	(13.1, 16.0)	
Gender						<0.0001
	Male	2,531	2,598,816	17.0	(14.7, 19.7)	
	Female	3,588	2,890,414	12.4	(10.8, 14.3)	
	Other	39	40,549	0.0	NA	
Age						<0.0001
	1=18-20	105	156,355		NSF	
	2=21-24	260	365,065		NSF	
	3=25-34	989	958,937	6.2	(3.9, 9.7)	
	4=35-54	1,836	1,520,843	14.9	(12.2, 18.0)	
	5=55-64	972	977,490	22.3	(18.2, 26.9)	
	6=65-79	1,203	884,762	21.1	(17.5, 25.1)	
	7=80+	304	280,083	15.9	(10.6, 23.3)	
Ethnicity						<0.0001
	Hispanic	847	590,375	12.8	(9.3, 17.3)	
	Black	630	382,903	13.1	(9.0, 18.8)	
	White	3,238	3,732,957	15.6	(13.8, 17.7)	
	Asian	886	392,139	6.3	(4.4, 9.1)	
	Other	52	48,048		NSF	
Education						<0.0001
	Less than high school	182	300,634	16.1	(9.6, 25.8)	
	HS or GED	627	1,263,246	19.8	(15.7, 24.6)	
	Some college	1,385	1,082,810	18.0	(15.3, 21.2)	
	BA	1,646	1,588,970	12.0	(9.9, 14.5)	
	MS or professional degree	1,585	853,390	7.9	(6.3, 9.8)	
	PHD	463	242,294		NSF	
Employment						<0.0001
	1=employed	417	3,250,467	13.8	(11.9, 15.9)	
	2=unemployed	37	200,077	17.9	(11.4, 26.8)	
	3=homemaker	8	127,987		NSF	
	4=student	14	426,504		NSF	
	5=retired	222	1,035,352	18.5	(15.4, 22.0)	
	6=disabled	40	227,197	19.2	(11.4, 30.4)	
Income						0.1732
	1=Less than $15,000	69	444,104	14.3	(10.1, 19.7)	
	2=$15,000-<$30,000	96	480,917	21.5	(16.0, 28.2)	
	3=$30,000-<$50,000	104	574,694	16.8	(12.2, 22.6)	
	4=$50,000-<$100,000	186	1,174,259	15.9	(12.7, 19.7)	
	5=$100,000-<$150,000	113	771,751	13.3	(10.1, 17.5)	
	6=$150,000 and more	100	1,003,585	12.7	(9.7, 16.4)	
Marital status						0.0068
	1=Never married	156	1,368,584	10.3	(7.9, 13.2)	
	2=Living with partner	78	555,065	16.7	(12.3, 22.3)	
	3=Married	320	2,531,019	14.6	(12.5, 17.0)	
	4=Divorced or Separated	120	500,464	17.8	(13.1, 23.6)	
	5=Widowed	60	306,437	20.7	(14.4, 28.8)	

		Unweighted N	Weighted N	%	95% CI	p-value
Military status						0.0419
	Yes, now on active duty	3	20,889		NSF	
	Yes, on active duty in the past, but not during the last 12 months	56	301,843	21.0	(14.5, 29.5)	
	No, training for Reserves or National Guard only	23	81,861	38.7	(22.1, 58.4)	
	No, never served in the military	664	4,927,755	13.5	(12.0, 15.1)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 66. Any raffles by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		6,267	5,602,246	18.6	(17.2, 20.2)	
Gender						0.0079
	Male	2,530	2,594,958	17.6	(15.4, 20.1)	
	Female	3,598	2,895,688	19.8	(17.9, 21.9)	
	Other	39	40,549		NSF	
Age						<0.0001
	1=18-20	105	156,355		NSF	
	2=21-24	259	364,310		NSF	
	3=25-34	988	956,593	11.8	(8.7, 16.0)	
	4=35-54	1,835	1,521,219	21.2	(18.4, 24.2)	
	5=55-64	977	983,974	24.0	(20.0, 28.4)	
	6=65-79	1,205	882,320	24.7	(21.3, 28.4)	
	7=80+	306	279,596	20.0	(14.2, 27.3)	
Ethnicity						<0.0001
	Hispanic	852	592,112	11.6	(8.7, 15.3)	
	Black	633	385,970	11.4	(7.9, 16.1)	
	White	3,240	3,730,500	21.7	(19.8, 23.8)	
	Asian	887	393,081	11.1	(7.6, 16.0)	
	Other	52	48,048		NSF	
Education						<0.0001
	Less than high school	187	303,317	9.5	(5.3, 16.5)	
	HS or GED	627	1,260,086	16.6	(12.8, 21.2)	
	Some college	1,387	1,084,148	21.6	(18.6, 25.0)	
	BA	1,648	1,590,291	19.1	(16.6, 21.8)	
	MS or professional degree	1,588	855,121	22.0	(19.3, 24.9)	
	PHD	461	241,112	10.6	(7.4, 15.0)	
Employment						<0.0001
	1=employed	3,621	3,249,167	19.8	(17.8, 21.9)	
	2=unemployed	208	204,402		NSF	
	3=homemaker	134	127,873	23.0	(14.1, 35.1)	
	4=student	386	426,456		NSF	
	5=retired	1,257	1,033,009	20.6	(17.8, 23.8)	
	6=disabled	235	229,033	16.8	(9.9, 27.0)	
Income						<0.0001
	1=Less than $15,000	447	450,793	9.8	(6.3, 15.0)	
	2=$15,000-<$30,000	485	481,059	16.5	(11.7, 22.8)	
	3=$30,000-<$50,000	631	570,575	14.8	(11.3, 19.2)	
	4=$50,000-<$100,000	1,351	1,174,192	18.7	(15.7, 22.2)	
	5=$100,000-<$150,000	879	771,234	20.8	(17.2, 25.0)	
	6=$150,000 and more	1,109	1,005,561	26.8	(22.9, 31.0)	
Marital status						<0.0001
	1=Never married	1,520	1,369,559	11.1	(8.6, 14.2)	
	2=Living with partner	539	554,895	12.9	(9.5, 17.2)	
	3=Married	2,737	2,532,059	22.7	(20.4, 25.1)	
	4=Divorced or Separated	675	502,523	23.2	(18.1, 29.3)	
	5=Widowed	348	306,101	22.5	(17.0, 29.2)	

		Unweighted N	Weighted N	%	95% CI	p-value
Military status						0.2316
	Yes, now on active duty	18	20,889		NSF	
	Yes, on active duty in the past, but not during the last 12 months	283	301,318	21.4	(15.8, 28.4)	
	No, training for Reserves or National Guard only	76	81,380		NSF	
	No, never served in the military	5,539	4,933,031	18.5	(16.9, 20.2)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 67. Any casino by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		5,957	5,296,597	15.7	(14.3, 17.3)	
Gender						0.6963
	Male	2,413	2,445,193	16.5	(14.2, 19.0)	
	Female	3,412	2,743,986	15.4	(13.5, 17.6)	
	Other	39	40,549		NSF	
Age						0.0006
	1=18-20	102	151,121		NSF	
	2=21-24	254	351,120	13.0	(8.2, 19.9)	
	3=25-34	961	916,500	17.3	(13.8, 21.4)	
	4=35-54	1,781	1,453,448	17.8	(14.8, 21.3)	
	5=55-64	921	939,070	13.6	(10.4, 17.6)	
	6=65-79	1,124	818,840	16.5	(13.2, 20.5)	
	7=80+	268	243,178	10.8	(6.5, 17.4)	
Ethnicity						0.1530
	Hispanic	797	547,931	16.9	(12.4, 22.7)	
	Black	591	361,433	16.8	(12.0, 22.9)	
	White	3,095	3,540,332	15.6	(13.7, 17.6)	
	Asian	868	384,620	13.4	(10.1, 17.6)	
	Other	45	40,834		NSF	
Education						<0.0001
	Less than high school	159	263,308		NSF	
	HS or GED	565	1,162,515	19.5	(15.3, 24.5)	
	Some college	1,299	1,020,661	17.3	(14.5, 20.5)	
	BA	1,606	1,537,886	16.5	(14.0, 19.3)	
	MS or professional degree	1,536	832,789	11.3	(9.2, 13.9)	
	PHD	452	235,800	6.1	(3.4, 10.7)	
Employment						<0.0001
	1=employed	3,491	3,115,820	16.7	(14.7, 19.0)	
	2=unemployed	199	196,907	11.6	(6.8, 19.1)	
	3=homemaker	127	119,912		NSF	
	4=student	377	415,721	8.6	(5.2, 14.0)	
	5=retired	1,156	941,545	14.9	(12.2, 18.1)	
	6=disabled	213	203,948	20.5	(12.6, 31.6)	
Income						0.0109
	1=Less than $15,000	406	398,505	9.1	(5.8, 14.0)	
	2=$15,000-<$30,000	440	436,239	16.1	(10.9, 23.1)	
	3=$30,000-<$50,000	591	522,871	19.7	(14.5, 26.3)	
	4=$50,000-<$100,000	1,294	1,115,442	18.1	(14.8, 22.0)	
	5=$100,000-<$150,000	849	755,307	18.4	(14.5, 23.1)	
	6=$150,000 and more	1,080	975,954	13.9	(11.0, 17.4)	
Marital status						0.0003
	1=Never married	1,464	1,306,107	12.6	(10.0, 15.6)	

		Unweighted N	Weighted N	%	95% CI	p-value
	2=Living with partner	510	530,469	22.0	(16.7, 28.4)	
	3=Married	2,634	2,439,556	16.4	(14.2, 18.9)	
	4=Divorced or Separated	620	454,926	16.6	(11.9, 22.7)	
	5=Widowed	312	260,785	8.1	(5.1, 12.6)	
Military status						0.6791
	Yes, now on active duty	17	20,176		NSF	
	Yes, on active duty in the past, but not during the last 12 months	260	282,076	13.0	(8.5, 19.4)	
	No, training for Reserves or National Guard only	71	74,537		NSF	
	No, never served in the military	5,292	4,690,806	15.5	(14.0, 17.3)	

Unweighted N refers to the total number of respondents who answered this question Weighted N is the total number of respondents who answered the question weighted to the MA population

Percentages and 95% CI are calculated using the weighted N

Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 68. Any sports betting by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		6,259	5,601,609	9.9	(8.6, 11.2)	
Gender						<0.0001
	Male	2,530	2,598,410	14.5	(12.4, 16.9)	
	Female	3,591	2,893,331	6.0	(4.7, 7.6)	
	Other	39	40,549	0.0	NA	
Age						<0.0001
	1=18-20	105	156,355		NSF	
	2=21-24	260	365,123		NSF	
	3=25-34	986	958,011	13.1	(10.0, 17.1)	
	4=35-54	1,836	1,518,948	12.7	(10.0, 15.9)	
	5=55-64	975	983,765	8.3	(6.1, 11.1)	
	6=65-79	1,198	879,527	5.2	(3.7, 7.4)	
	7=80+	307	282,804		NSF	
Ethnicity						<0.0001
	Hispanic	848	590,785	5.6	(3.2, 9.5)	
	Black	629	383,915		NSF	
	White	3,239	3,733,656	11.8	(10.1, 13.7)	
	Asian	887	392,855	6.9	(4.8, 9.8)	
	Other	52	48,048		NSF	
Education						0.1411
	Less than high school	186	302,844		NSF	
	HS or GED	622	1,262,276	7.8	(5.1, 11.8)	
	Some college	1,385	1,080,779	9.1	(6.8, 12.0)	
	BA	1,648	1,591,118	12.9	(10.5, 15.7)	
	MS or professional degree	1,584	853,378	9.6	(7.5, 12.1)	
	PHD	463	242,294	10.1	(6.1, 16.3)	
Employment						<0.0001
	1=employed	3,619	3,250,928	12.0	(10.2, 13.9)	
	2=unemployed	206	203,012		NSF	
	3=homemaker	134	127,819		NSF	
	4=student	387	426,678		NSF	
	5=retired	1,251	1,030,257	5.9	(4.3, 8.0)	
	6=disabled	234	228,843		NSF	
Income						<0.0001
	1=Less than $15,000	441	446,114		NSF	
	2=$15,000-<$30,000	484	477,310		NSF	
	3=$30,000-<$50,000	633	574,952	9.1	(5.6, 14.3)	
	4=$50,000-<$100,000	1,352	1,174,227	8.6	(6.2, 11.8)	
	5=$100,000-<$150,000	880	773,188	13.5	(10.0, 18.1)	
	6=$150,000 and more	1,104	1,004,148	18.3	(14.7, 22.5)	
Marital status						<0.0001
	1=Never married	1,518	1,369,928	10.0	(7.5, 13.1)	
	2=Living with partner	534	552,025	15.0	(10.3, 21.1)	

		Unweighted N	Weighted N	%	95% CI	p-value
	3=Married	2,735	2,533,656	10.4	(8.6, 12.5)	
	4=Divorced or Separated	672	500,372	5.1	(3.1, 8.4)	
	5=Widowed	350	307,843		NSF	
Military status						0.3461
	Yes, now on active duty	18	20,889		NSF	
	Yes, on active duty in the past, but not during the last 12 months	283	301,729	10.0	(6.4, 15.4)	
	No, training for Reserves or National Guard only	76	81,388		NSF	
	No, never served in the military	5,528	4,928,254	9.7	(8.4, 11.1)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 69. Any private wagering by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		6,234	5,580,405	6.7	(5.7, 7.8)	
Gender						<0.0001
	Male	2,512	2,582,430	10.2	(8.4, 12.4)	
	Female	3,584	2,886,489	3.6	(2.7, 4.6)	
	Other	39	40,549		NSF	
Age						0.0096
	1=18-20	105	156,355		NSF	
	2=21-24	259	364,659		NSF	
	3=25-34	984	956,648	9.7	(7.2, 12.9)	
	4=35-54	1,830	1,516,516	6.2	(4.5, 8.5)	
	5=55-64	969	971,144	5.2	(3.6, 7.4)	
	6=65-79	1,197	879,756	4.2	(2.7, 6.6)	
	7=80+	303	277,809	3.9	(2.4, 6.4)	
Ethnicity						0.0007
	Hispanic	846	587,256		NSF	
	Black	631	385,628		NSF	
	White	3,242	3,732,931	7.4	(6.1, 8.9)	
	Asian	887	392,866	6.5	(4.2, 10.1)	
	Other	51	47,818		NSF	
Education						0.0125
	Less than high school	186	301,590		NSF	
	HS or GED	628	1,265,204		NSF	
	Some college	1,381	1,081,457	7.1	(5.2, 9.8)	
	BA	1,647	1,589,120	9.3	(7.4, 11.7)	
	MS or professional degree	1,588	854,482	6.7	(5.1, 8.7)	
	PHD	462	242,180		NSF	
Employment						<0.0001
	1=employed	3,622	3,250,617	7.8	(6.4, 9.4)	
	2=unemployed	206	202,352		NSF	
	3=homemaker	135	127,987		NSF	
	4=student	385	426,413	13.0	(7.8, 20.7)	
	5=retired	1,253	1,035,036	4.0	(2.8, 5.5)	
	6=disabled	236	229,223		NSF	
Income						<0.0001
	1=Less than $15,000	447	449,336		NSF	
	2=$15,000-<$30,000	484	480,694		NSF	
	3=$30,000-<$50,000	631	575,582		NSF	
	4=$50,000-<$100,000	1,352	1,171,109	7.6	(5.5, 10.3)	
	5=$100,000-<$150,000	876	768,781	10.0	(6.9, 14.4)	
	6=$150,000 and more	1,107	1,004,519	11.5	(8.8, 15.0)	
Marital status						<0.0001
	1=Never married	1,520	1,369,721	7.9	(5.8, 10.8)	
	2=Living with partner	539	554,334	7.7	(5.1, 11.5)	

		Unweighted N	Weighted N	%	95% CI	p-value
	3=Married	2,737	2,534,535	7.0	(5.6, 8.8)	
	4=Divorced or Separated	673	499,777	3.6	(2.3, 5.6)	
	5=Widowed	348	307,213		NSF	
Military status						0.8261
	Yes, now on active duty	18	20,889		NSF	
	Yes, on active duty in the past, but not during the last 12 months	280	297,306	6.6	(3.7, 11.3)	
	No, training for Reserves or National Guard only	77	81,962		NSF	
	No, never served in the military	5,537	4,935,807	6.6	(5.6, 7.8)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 70. Any horse racing by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		6,236	5,580,261	2.6	(2.0, 3.3)	
Gender						<0.0001
	Male	2,516	2,584,631	4.1	(3.0, 5.7)	
	Female	3,583	2,887,097	1.2	(0.8, 1.8)	
	Other	39	40,549	0.0	NA	
Age						0.0003
	1=18-20	105	156,355		NSF	
	2=21-24	259	364,474		NSF	
	3=25-34	985	958,142		NSF	
	4=35-54	1,827	1,512,369	2.5	(1.4, 4.2)	
	5=55-64	970	973,802	2.5	(1.4, 4.3)	
	6=65-79	1,200	880,195	4.0	(2.2, 7.1)	
	7=80+	306	280,563		NSF	
Ethnicity						0.0003
	Hispanic	849	589,735		NSF	
	Black	632	385,293		NSF	
	White	3,241	3,731,750	3.1	(2.3, 4.2)	
	Asian	886	393,096		NSF	
	Other	51	47,818	0.0	NA	
Education						<0.0001
	Less than high school	185	301,356		NSF	
	HS or GED	628	1,260,958		NSF	
	Some college	1,384	1,081,141		NSF	
	BA	1,645	1,589,030	3.3	(2.2, 4.9)	
	MS or professional degree	1,586	854,335	2.4	(1.5, 3.7)	
	PHD	462	242,180		NSF	
Employment						<0.0001
	1=employed	3,618	3,244,726	2.8	(2.0, 4.0)	
	2=unemployed	206	202,232		NSF	
	3=homemaker	135	127,987		NSF	
	4=student	386	426,379		NSF	
	5=retired	1,256	1,036,477	3.3	(2.0, 5.3)	
	6=disabled	235	228,989		NSF	
Income						<0.0001
	1=Less than $15,000	446	449,051		NSF	
	2=$15,000-<$30,000	484	480,662		NSF	
	3=$30,000-<$50,000	630	574,285		NSF	
	4=$50,000-<$100,000	1,350	1,169,529		NSF	
	5=$100,000-<$150,000	876	769,314		NSF	
	6=$150,000 and more	1,108	1,005,385	4.1	(2.6, 6.4)	
Marital status						0.2226
	1=Never married	1,519	1,369,338		NSF	
	2=Living with partner	540	555,638		NSF	

		Unweighted N	Weighted N	%	95% CI	p-value
	3=Married	2,737	2,530,706	3.1	(2.1, 4.6)	
	4=Divorced or Separated	670	501,666		NSF	
	5=Widowed	347	303,119		NSF	
Military status						0.6837
	Yes, now on active duty	18	20,889		NSF	
	Yes, on active duty in the past, but not during the last 12 months	279	296,391		NSF	
	No, training for Reserves or National Guard only	78	82,860		NSF	
	No, never served in the military	5,539	4,936,019	2.4	(1.8, 3.2)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 71. Any bingo by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		6,268	5,605,669	2.1	(1.5, 2.8)	
Gender						0.0053
	Male	2,532	2,596,377	1.1	(0.6, 1.8)	
	Female	3,598	2,897,805	2.9	(2.1, 4.2)	
	Other	39	40,549		NSF	
Age						0.8689
	1=18-20	105	156,355		NSF	
	2=21-24	261	365,513		NSF	
	3=25-34	987	956,988		NSF	
	4=35-54	1,835	1,517,481	1.8	(1.0, 3.0)	
	5=55-64	977	981,513		NSF	
	6=65-79	1,206	887,424		NSF	
	7=80+	308	282,392		NSF	
Ethnicity						0.9242
	Hispanic	853	591,137		NSF	
	Black	629	383,849		NSF	
	White	3,244	3,738,450	1.9	(1.3, 2.8)	
	Asian	887	392,971		NSF	
	Other	52	48,048		NSF	
Education						0.0001
	Less than high school	188	304,315		NSF	
	HS or GED	626	1,265,199		NSF	
	Some college	1,386	1,082,012	3.3	(2.0, 5.4)	
	BA	1,647	1,587,279		NSF	
	MS or professional degree	1,589	855,041		NSF	
	PHD	461	241,924		NSF	
Employment						0.1932
	1=employed	3,621	3,248,435	1.4	(0.8, 2.3)	
	2=unemployed	208	204,402		NSF	
	3=homemaker	133	127,152		NSF	
	4=student	387	426,678		NSF	
	5=retired	1,257	1,037,831	2.7	(1.6, 4.4)	
	6=disabled	233	225,806		NSF	
Income						<0.0001
	1=Less than $15,000	447	450,067		NSF	
	2=$15,000-<$30,000	486	480,877		NSF	
	3=$30,000-<$50,000	631	573,231		NSF	
	4=$50,000-<$100,000	1,352	1,174,121		NSF	
	5=$100,000-<$150,000	879	773,136		NSF	
	6=$150,000 and more	1,107	1,002,076		NSF	
Marital status						0.0310
	1=Never married	1,523	1,371,151		NSF	
	2=Living with partner	540	555,638		NSF	

		Unweighted N	Weighted N	%	95% CI	p-value
	3=Married	2,734	2,530,452		NSF	
	4=Divorced or Separated	671	500,751		NSF	
	5=Widowed	349	306,727		NSF	
Military status						0.7224
	Yes, now on active duty	18	20,889		NSF	
	Yes, on active duty in the past, but not during the last 12 months	283	301,729		NSF	
	No, training for Reserves or National Guard only	78	82,860		NSF	
	No, never served in the military	5,534	4,929,704	1.9	(1.4, 2.6)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 72. Any online by demographics

		Unweighted N	Weighted N	%	95% CI	p-value
Overall		6,232	5,581,266	2.7	(2.0, 3.5)	
Gender						0.0100
	Male	2,513	2,586,189	3.8	(2.7, 5.2)	
	Female	3,580	2,883,477	1.6	(1.0, 2.6)	
	Other	39	40,549		NSF	
Age						0.0008
	1=18-20	104	155,816		NSF	
	2=21-24	260	364,773		NSF	
	3=25-34	983	957,507	3.1	(1.8, 5.1)	
	4=35-54	1,828	1,514,755	4.0	(2.5, 6.2)	
	5=55-64	969	973,287		NSF	
	6=65-79	1,196	881,420		NSF	
	7=80+	306	280,732		NSF	
Ethnicity						0.0165
	Hispanic	854	593,300		NSF	
	Black	628	383,035		NSF	
	White	3,238	3,730,505	3.2	(2.4, 4.4)	
	Asian	886	392,638		NSF	
	Other	51	47,818		NSF	
Education						0.5771
	Less than high school	186	300,414		NSF	
	HS or GED	624	1,266,316		NSF	
	Some college	1,388	1,085,002	2.0	(1.2, 3.2)	
	BA	1,645	1,586,633	3.5	(2.4, 5.2)	
	MS or professional degree	1,587	854,332	2.3	(1.4, 3.8)	
	PHD	463	242,294		NSF	
Employment						0.0019
	1=employed	3,621	3,249,308	3.1	(2.2, 4.2)	
	2=unemployed	207	204,156		NSF	
	3=homemaker	134	126,475		NSF	
	4=student	385	425,916		NSF	
	5=retired	1,254	1,037,497		NSF	
	6=disabled	235	227,956		NSF	
Income						0.0100
	1=Less than $15,000	446	448,335		NSF	
	2=$15,000-<$30,000	485	480,396		NSF	
	3=$30,000-<$50,000	630	574,838		NSF	
	4=$50,000-<$100,000	1,352	1,170,957	3.6	(2.0, 6.3)	
	5=$100,000-<$150,000	878	772,618		NSF	
	6=$150,000 and more	1,107	1,004,901	4.1	(2.5, 6.8)	
Marital status						<0.0001
	1=Never married	1,518	1,368,588	2.8	(1.7, 4.6)	
	2=Living with partner	535	550,610		NSF	

		Unweighted N	Weighted N	%	95% CI	p-value
	3=Married	2,739	2,536,891	3.1	(2.1, 4.5)	
	4=Divorced or Separated	674	502,280		NSF	
	5=Widowed	347	307,105		NSF	
Military status						0.9835
	Yes, now on active duty	17	20,176		NSF	
	Yes, on active duty in the past, but not during the last 12 months	282	299,537		NSF	
	No, training for Reserves or National Guard only	77	82,637		NSF	
	No, never served in the military	5,535	4,933,326	2.8	(2.1, 3.6)	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 73. Number and types of activities in which past-year gamblers participated

	Unweighted N	Weighted N	Average # other gambling activities participated in	Percent also participated in							
				All lottery	Raffles	Sports	Bingo	Horse racing	Private	Casino	Online
All lottery	2,811	2,658,473	0.9		28.4	14.5	3.0	4.3	8.8	25.6	4.1
Raffles	1,108	1,042,536	1.4	72.5		17.2	6.3	5.8	11.8	26.0	4.2
Sports	483	552,836	2.1	69.5	32.3		6.0	15.1	30.9	40.1	17.1
Bingo	112	116,210	2.5	67.9	56.5	28.8		9.4	24.8	61.1	9.1
Horse racing	125	142,570	3.0	79.4	41.6	58.3	7.6		33.3	66.2	22.2
Private	360	373,721	2.0	61.7	32.6	45.0	7.5	12.1		34.3	11.5
Casino (in or out of state)	872	833,507	1.7	77.0	30.8	25.9	8.0	10.8	15.3		6.8
Online	139	148,532	2.6	72.6	28.9	63.4	7.0	20.4	28.9	38.5	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population

Table 74. Frequency of gambling participation by demographics

		Unweighted N	Weighted N	% missing	Non gambler %	Non gambler 95% CI[1]	Yearly gambler %	Yearly gambler 95% CI	Monthly gambler %	Monthly gambler 95% CI[4]	Weekly gambler %[4]	Weekly gambler 95% CI	p-value
Overall		6,184	5,517,713		39.8	(37.8, 41.7)	33.5	(31.7, 35.4)	14.6	(13.2, 16.2)	12.1	(10.8, 13.5)	
	Missing	109	105,196	2%									
Gender													<0.0001
	Male	2,512	2,573,272		36.1	(33.1, 39.2)	30.5	(27.7, 33.5)	16.3	(14.0, 19.0)	17.0	(14.7, 19.6)	
	Female	3,537	2,834,547		42.1	(39.5, 44.7)	36.9	(34.4, 39.4)	13.2	(11.4, 15.3)	7.8	(6.5, 9.4)	
	Other	39	40,549		69.0	(44.3, 86.2)		NSF		NSF		NSF	
	Missing	96	69,345	1%									
Age													<0.0001
	18-20	104	155,141		63.9	(48.9, 76.6)	23.9	(13.5, 38.7)		NSF		NSF	
	21-24	257	352,714		58.2	(48.2, 67.6)	29.1	(21.0, 38.8)		NSF		NSF	
	25-34	982	952,233		47.0	(41.8, 52.2)	35.3	(30.6, 40.4)	10.8	(7.8, 14.9)	6.9	(4.4, 10.7)	
	35-54	1,821	1,496,732		35.9	(32.4, 39.5)	35.6	(32.2, 39.2)	17.4	(14.4, 20.9)	11.1	(8.7, 13.9)	
	55-64	967	973,134		29.5	(25.2, 34.2)	36.3	(31.7, 41.1)	17.5	(13.6, 22.1)	16.8	(13.3, 20.9)	
	65-79	1,182	868,040		35.9	(31.9, 40.1)	33.1	(29.3, 37.2)	15.1	(12.2, 18.4)	15.9	(12.8, 19.6)	
	80+	294	269,095		44.4	(36.0, 53.2)	22.4	(16.2, 30.2)	15.9	(10.0, 24.3)	17.3	(11.7, 24.7)	
	Missing	577	450,623	9%									
Ethnicity													<0.0001
	Hispanic	835	577,854		46.0	(40.1, 51.9)	26.5	(21.7, 32.0)	18.4	(14.0, 23.8)	9.2	(6.7, 12.5)	
	Black	624	384,016		47.0	(39.3, 54.9)	25.5	(19.5, 32.5)	12.9	(8.7, 18.8)	14.6	(9.7, 21.2)	
	White	3,200	3,676,628		35.8	(33.3, 38.3)	36.3	(33.9, 38.7)	14.7	(12.9, 16.8)	13.2	(11.5, 15.2)	
	Asian	884	392,032		57.1	(51.5, 62.5)	29.4	(24.5, 34.8)	7.9	(5.7, 10.8)	5.6	(3.7, 8.6)	
	Other	48	43,532			NSF		NSF		NSF		NSF	
	Missing	593	443,651	9%									
Education													<0.0001
	Less than high school	177	291,381		47.0	(36.4, 57.9)	20.5	(13.2, 30.3)	20.2	(12.6, 30.7)		NSF	
	HS or GED	610	1,224,780		36.8	(31.6, 42.2)	25.8	(21.2, 31.0)	20.2	(15.9, 25.3)	17.2	(13.4, 21.9)	
	Some college	1,365	1,068,343		32.7	(29.0, 36.7)	35.6	(31.8, 39.7)	15.3	(12.7, 18.4)	16.3	(13.7, 19.4)	
	BA	1,640	1,583,702		40.5	(37.1, 44.1)	37.3	(34.0, 40.7)	13.2	(11.0, 15.8)	9.0	(7.0, 11.4)	
	MS or professional degree	1,572	848,273		44.0	(40.5, 47.5)	39.7	(36.3, 43.3)	9.0	(7.3, 11.0)	7.3	(5.7, 9.4)	
	PHD	459	240,200		61.2	(54.1, 67.9)	29.7	(23.7, 36.4)		NSF		NSF	
	Missing	361	261,033	5%									
Employment													<0.0001
	1=employed	3,593	3,218,650		37.4	(34.9, 39.9)	36.4	(34.0, 39.0)	15.6	(13.5, 17.9)	10.6	(9.0, 12.5)	
	2=unemployed	204	200,069		33.9	(23.8, 45.8)	34.4	(23.8, 46.9)	17.6	(10.7, 27.7)		NSF	
	3=homemaker	131	125,227		55.8	(43.3, 67.6)	27.5	(17.7, 40.1)		NSF		NSF	
	4=student	382	422,955		58.4	(49.8, 66.6)	29.7	(22.5, 38.1)	4.2	(2.3, 7.4)		NSF	
	5=retired	1,231	1,013,551		38.6	(34.6, 42.8)	30.0	(26.5, 33.9)	13.4	(10.9, 16.4)	17.9	(14.9, 21.5)	
	6=disabled	228	217,610		40.8	(30.0, 52.7)	18.4	(12.5, 26.4)	26.7	(17.4, 38.8)	14.0	(7.7, 24.1)	
	Missing	415	319,652	6%									

		Unweighted N	Weighted N	% missing	Non gambler %	Non gambler 95% CI[1]	Yearly gambler %	Yearly gambler 95% CI	Monthly gambler %	Monthly gambler 95% CI[4]	Weekly gambler %[4]	Weekly gambler 95% CI	p-value
Income													<0.0001
	1=Less than $15,000	435	424,266		48.1	(40.1, 56.2)	23.3	(17.2, 30.9)	15.3	(10.3, 22.1)	13.3	(8.9, 19.4)	
	2=$15,000-<$30,000	474	464,779		41.5	(34.4, 48.9)	24.4	(18.5, 31.4)	20.7	(15.3, 27.4)	13.4	(9.3, 18.8)	
	3=$30,000-<$50,000	621	564,616		39.2	(33.0, 45.8)	26.2	(21.1, 32.0)	23.2	(17.2, 30.4)	11.5	(8.0, 16.1)	
	4=$50,000-<$100,000	1,339	1,165,667		37.3	(33.0, 41.7)	34.6	(30.4, 38.9)	16.2	(13.2, 19.8)	12.0	(9.1, 15.5)	
	5=$100,000-<$150,000	870	766,994		35.6	(31.0, 40.5)	37.8	(33.1, 42.8)	11.5	(8.6, 15.3)	15.1	(11.5, 19.6)	
	6=$150,000 and more	1,098	998,075		34.3	(30.3, 38.6)	42.7	(38.3, 47.2)	11.1	(8.3, 14.9)	11.9	(8.8, 15.8)	
	Missing	1,347	1,133,316	26%									
Marital status													0.0201
	1=Never married	1,504	1,350,967		46.1	(41.7, 50.6)	31.5	(27.4, 35.8)	11.1	(8.8, 14.1)	11.3	(8.6, 14.8)	
	2=Living with partner	534	545,311		37.2	(31.0, 43.9)	33.0	(27.2, 39.3)	18.2	(13.1, 24.6)	11.7	(8.0, 16.8)	
	3=Married	2,709	2,512,915		37.3	(34.6, 40.0)	35.9	(33.3, 38.7)	14.7	(12.6, 17.2)	12.0	(10.2, 14.2)	
	4=Divorced or Separated	661	491,311		36.8	(30.4, 43.7)	29.7	(24.2, 35.8)	20.6	(15.3, 27.2)	12.9	(9.5, 17.4)	
	5=Widowed	335	294,939		39.8	(32.3, 48.0)	32.2	(25.4, 39.9)	10.3	(6.6, 15.8)	17.6	(11.4, 26.1)	
	Missing	441	322,270	6%									
Military status													0.0119
	Yes, now on active duty	18	20,889			NSF		NSF		NSF		NSF	
	Yes, on active duty in the past, but not in the last 12 months	278	296,880		27.3	(20.5, 35.4)	34.5	(26.7, 43.2)	18.1	(11.5, 27.4)	20.1	(14.3, 27.4)	
	No, training for Reserves or National Guard only	76	81,388		29.9	(17.5, 46.2)		NSF		NSF		NSF	
	No, never served in the military	5,468	4,864,765		40.7	(38.6, 42.8)	34.0	(32.0, 36.0)	14.1	(12.6, 15.8)	11.2	(9.8, 12.7)	
	Missing	344	253,790	5%									

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
The % missing is calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Appendix F: Problem Gambling in Massachusetts

Appendix F1: Development and Performance of the PPGM

The PPGM is a 14-item assessment instrument with questions organized into three sections: Problems, Impaired Control, and Other Issues. The instrument employs a 12-month timeframe and recognizes a continuum of gambling across four categories (Recreational, At-Risk, Problem, and Pathological). The PPGM has been field tested and refined with both clinical and general population samples.

Between 2007 and 2010, Williams and Volberg (2010, 2014) carried out a large study to re-evaluate the classification accuracy of the South Oaks Gambling Screen (SOGS), the Problem Gambling Severity Index (PGSI) and the NORC DSM-IV Screen for Gambling Problems (NODS) – a DSM-IV-based measure – and to investigate the performance of the PPGM relative to these other instruments. The sample for this study included 7,272 gamblers drawn from two earlier studies. The first study was an experimental investigation of the impact of administration modality and survey description on obtained problem gambling prevalence rates (Williams & Volberg, 2009). The second sample consisted of 12,521 individuals age 15 and older from 105 countries who completed an online survey of gambling in 2007 (Wood & Williams, 2009, 2011, 2012).

Both studies administered the SOGS, PSGI, NODS, and PPGM to everyone who had gambled in the past year. Participants who had one or more positive responses to any of the 39 problem gambling questions from any of the four instruments, and/or reported $50 or more in gambling losses in a typical month (estimated in U.S. dollars) were selected for clinical rating (n=4,071). A psychiatrist and a psychologist with experience in assessing and treating addictions were trained in the rating procedure. The psychiatrist and psychologist were then provided with written definitions of the typological categories as well as detailed written profiles of each selected participant's past-year gambling behavior and answers to the 39 problem gambling questions. Additional information about participants' demographics, history of addictions, substance use, and mental health issues was also provided.

Over a period of several months, the clinicians independently read each profile and assessed the person's gambling status. The choices available to them were Recreational Gambler, At-Risk Gambler, Problem Gambler, and Pathological Gambler (all using a past-year time frame). All cases in which the two clinicians disagreed (n=189; 4.6%) were reviewed to obtain a consensus decision. Each participant was given a designation of problem or non-problem gambler on each of the four instruments as well as by the joint rating of the clinicians. The relationship between the instrument versus clinician categorization was assessed using the indices of sensitivity, specificity, positive predictive power, negative predictive power, diagnostic efficiency, kappa, and the instrument versus clinician problem gambling prevalence ratio. A *z* test of proportions was used to make statistical comparisons between the instruments on sensitivity, specificity, positive predictive power, negative predictive power, and diagnostic efficiency.

Across the two samples, the PPGM had a Cronbach's alpha of .81 and a one-month test-retest reliability of .78. (total score) and .68 (five categories). In terms of concurrent validity, the PPGM has the following Kendall-tau associations with the other instruments: .70 (PGSI), .69 (SOGS), and .78 (NODS). The PPGM also had a Kendall

tau association of .41 with gambling frequency and .20 with gambling net expenditure (Williams & Volberg, 2014). Subsequent research has demonstrated that the PPGM produces consistent results across different jurisdictions and over periods of time with the same people (Back et al., 2015; Williams et al., 2015).

The following table describes the performance of all four instruments assessed in the study, including sensitivity, specificity, positive predictive power, negative predictive power, diagnostic efficiency, kappa, and instrument/clinician prevalence ratio.

Table 75. Classification accuracy of the PGSI, SOGS, NODS, and PPGM

	PGSI	SOGS	NODS	PPGM
Sensitivity	91.2%	85.9%	68.5%	99.7%
Specificity	85.5%	90.4%	96.8%	98.9%
Positive Predictive Power	49.4%	56.5%	76.8%	93.5%
Negative Predictive Power	98.4%	97.8%	95.2%	99.9%
Diagnostic Efficiency	86.3%	89.8%	93.0%	99.0%
Kappa	0.56	0.62	0.68	0.96
Instrument Prevalence/Clinician Prevalence	1.85	1.52	0.89	1.07

Sensitivity: % of individuals clinically assessed as problem gamblers that also receive this designation on the assessment instrument.

Specificity: % of individuals clinically assessed as non-problem gamblers that also receive this designation on the assessment instrument.

Positive Predictive Power: % of individuals that are designated as problem gamblers on the assessment instrument that are confirmed as problem gamblers in the clinical assessment.

Negative Predictive Power: % of individuals that are designated as non-problem gamblers on the assessment instrument that are confirmed as non-problem gamblers in the clinical assessment.

Diagnostic Efficiency: Number of true positives (correctly identified as problem gamblers) + true negatives (correctly identified as non-problem gamblers) divided by the total sample size.

Kappa: A quantitative measure of overall agreement after taking chance agreement into account.

Instrument Prevalence/Clinician Prevalence: The prevalence rate of problem gambling as determined by the assessment instrument divided by the prevalence rate of problem gambling as determined by clinical assessment.

Appendix F2: Problem and Pathological Gambling Measure (PPGM)

1a. Has <u>your</u> involvement in gambling caused you either to borrow a significant [16] amount of money or sell some of your possessions in the past 12 months? (Yes/No).
1b. Has <u>your</u> involvement in gambling caused significant **financial concerns** for you or someone close to you in the past 12 months? (Yes/No). (Note: do not score 1 for 1b if 1 has already been scored for 1a).
2. Has <u>your</u> involvement in gambling caused significant **mental stress** in the form of guilt, anxiety, or depression for you or someone close to you in the past 12 months? (Yes/No).
3a. Has <u>your</u> involvement in gambling caused serious problems [17] in your **relationship with your spouse/partner, or important friends or family** in the past 12 months? (Note: Family is whomever the person themselves defines as "family")(Yes/No).
3b. Has <u>your</u> involvement in gambling caused you to repeatedly neglect your children or family in the past 12 months? (Yes/No). (Note: do not score 1 for 3b if 1 has already been scored for 3a).
4. Has <u>your</u> involvement in gambling resulted in significant **health problems** or injury for you or someone close to you in the past 12 months? (Yes/No).
5a. Has <u>your</u> involvement in gambling caused significant **work or school problems** for you or someone close to you in the past 12 months? (Yes/No).
5b. Has <u>your</u> involvement in gambling caused you to miss a significant amount of time off work or school in the past 12 months? (Yes/No). (Note: do not score 1 for 5b if 1 has already been scored for 5a).
6. Has <u>your</u> involvement in gambling caused you or someone close to you to write bad cheques, take money that didn't belong to you or commit other **illegal acts** to support your gambling in the past 12 months? (Yes/No).
7. Is there anyone else who would say that <u>your</u> involvement in gambling in the past 12 months has caused any significant problems regardless of whether you agree with them or not? (Yes/No).

PROBLEMS SCORE	**/7**

8. In the past 12 months, have you often gambled longer, with more money or more frequently than you intended to? (Yes/No).
9. In the past 12 months, have you often gone back to try and win back the money you lost? (Yes/No).
10a. In the past 12 months, have you made any attempts to either cut down, control or stop your gambling? (Yes/No). (go to 11 if 'no') (this item not scored)
10b. Were you successful in these attempts? (Yes/No). (score '1' for no and '0' for yes)
11. In the past 12 months, is there anyone else who would say that you have had difficulty controlling your gambling, regardless of whether you agreed with them or not? (Yes/No).

IMPAIRED CONTROL SCORE	**/4**

12. In the past 12 months, would you say you have been preoccupied with gambling? (Yes/No).
13. In the past 12 months, when you were not gambling did you often experience irritability, restlessness or strong cravings for it? (Yes/No).

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[16] *If people ask what 'significant' means, say 'significant means something that either you or someone else would say is considerable, important, or major', either because of its frequency or seriousness*
[17] *If people ask what 'problem' means say 'a difficulty that needs to be fixed'.*

14. In the past 12 months, did you find you needed to gamble with larger and larger amounts of money to achieve the same level of excitement? (Yes/No).

OTHER ISSUES SCORE	**/3**

TOTAL SCORE	**/14**

PPGM Scoring and Classification

PATHOLOGICAL GAMBLER (4)

1. Problems Score of 1 or higher, plus
2. Impaired Control Score of 1 or higher, plus
3. Total Score of 5 or higher, plus
4. Reported gambling frequency of at least once a month on some form of gambling.

PROBLEM GAMBLER (3)

1. Problems Score of 1 or higher, plus
2. Impaired Control Score of 1 or higher, plus
3. Total Score of 2 to 4, plus
4. Reported gambling frequency of at least once a month on some form of gambling.

OR

1. Total Score of 3 or higher, plus
2. Frequency of gambling[18] AND average reported gambling loss (not net loss)[19] $\geq$ median for unambiguously identified Problem and Pathological Gamblers in the population (i.e., as established by the most recent population prevalence survey).

AT RISK GAMBLER (2) (this category also includes people who may be problem gamblers in denial)

1. Does not meet criteria for Problem or Pathological gambling, plus
2. Total Score of 1 or higher

OR

1. Frequency of gambling[1] AND average reported gambling loss (not net loss)[2] $\geq$ median for unambiguously identified Problem and Pathological Gamblers in the population (i.e., as established by the most recent population prevalence survey).

RECREATIONAL GAMBLER (1)

- Gambler who does not meet criteria for Pathological, Problem or At-Risk gambler.

NON-GAMBLER (0)

- No reported gambling on any form in past year.

[18] Simplest way of establishing this is using the highest frequency of gambling reported for any individual form in the past year.

[19] Reported gambling losses tend to be a more accurate estimate of true losses compared to net loss, especially in problem gamblers (i.e., problem gamblers often report winning as much or more than they lose and thus may not report any net loss) (Wood, R.T. & Williams, R.J**.** (2007b). How much money do you spend on gambling? The comparative validity of question wordings used to assess gambling expenditure. *International Journal of Social Research Methodology: Theory & Practice, 10 (1),* 63-77. http://hdl.handle.net/10133/752. Note: The person's income and net worth/debt can be taken into account when deciding whether the gambling loss criterion should apply.

Table 76. Comparing at-risk and problem gambling prevalence for specific types of gambling, 2013 and 2021

	BGPS				FGPS			
	At-risk gambler		Problem Gambler		At-risk gambler		Problem Gambler	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Total Sample/ Population	8.4	(7.5, 9.4)	2.0	(1.6, 2.6)	8.5	(7.4, 9.8)	1.4	(1.0, 2.1)
All Gambling	11.3	(10.1, 12.6)	2.8	(2.2, 3.5)	13.7	(11.9, 15.6)	2.3	(1.6, 3.4)
All lottery	12.7	(11.4, 14.2)	3.1	(2.5, 3.9)	15.0	(13.0, 17.3)	2.9	(2.0, 4.2)
Traditional	12.7	(11.3, 14.3)	3.3	(2.6, 4.2)	15.5	(13.4, 18.0)	2.7	(1.8, 4.1)
Instant games	16.3	(14.3, 18.4)	4.4	(3.4, 5.7)	19.8	(16.7, 23.4)	3.8	(2.5, 5.7)
Daily games	21.5	(18.1, 25.3)	7.6	(5.5, 10.4)	25.2	(20.6, 30.4)	4.0	(2.5, 6.2)
Raffles	10.9	(9.3, 12.8)	3.0	(2.1, 4.2)	14.5	(11.6, 17.9)	2.5	(1.5, 4.3)
Only Casinos-out of state	18.1	(15.7, 20.9)	4.7	(3.5, 6.2)	25.9	(18.0, 35.6)		NSF
Only Casinos-MA		NA		NA	11.9	(8.0, 17.3)		NSF
Casinos both in and out of state		NA		NA	35.8	(27.5, 45.0)		NSF
Casinos in or out of state		NA		NA	25.8	(21.3, 30.9)	5.0	(3.0, 8.3)
Sports betting	18.3	(14.9, 22.4)	6.5	(4.4, 9.5)	27.1	(21.2, 33.8)	1.6*	(0.9, 2.8)
Private wagering	18.5	(14.6, 23.2)	6.0	(3.8, 9.5)	23.1	(17.5, 29.8)	2.5	(1.5, 4.0)
Horse racing	18.6	(12.7, 26.4)	13.1	(7.7, 21.5)	32.3	(20.7, 46.4)		NSF
Bingo	23.2	(16.9, 31.0)		NSF	27.2	(16.4, 41.5)		NSF
Online	28.0	(18.1, 40.7)		NSF	44.7	(31.9, 58.3)		NSF

Percentages and 95% CI are calculated using the weighted N

Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

*Indicates significant change from Baseline

Appendix G: Comparing Gambler Groups

Table 77. Demographics of recreational, at-risk and problem gamblers

		Recreational gambler		At-risk gambler		Problem gambler		
		%	95% CI	%	95% CI	%	95% CI	p-value
Unweighted N		2,953		475		86		
Weighted N		2,792,337		464,290		77,521		
Gender	Male	47.3	(44.4, 50.2)	64.1	(56.9, 70.8)	70.4	(53.5, 83.1)	<0.0001
	Female	52.7	(49.8, 55.6)	35.9	(29.2, 43.1)	29.6	(16.9, 46.5)	
Age	18-24	6.7	(5.0, 8.9)	6.8	(3.9, 11.5)	NSF		0.2925
	25-34	16.8	(14.5, 19.3)	12.3	(8.4, 17.5)	NSF		
	35-54	30.5	(27.9, 33.2)	36.7	(29.4, 44.5)	NSF		
	55+	46.0	(43.0, 49.0)	44.3	(37.3, 51.5)	29.8	(16.6, 47.5)	
Ethnicity	Non-White	21.4	(19.2, 23.7)	31.3	(25.0, 38.3)	41.4	(25.3, 59.6)	0.0014
	White	78.6	(76.3, 80.8)	68.7	(61.7, 75.0)	58.6	(40.4, 74.7)	
Education	less than high school	5.1	(3.7, 7.0)	NSF		NSF		<0.0001
	HS or GED	21.6	(18.7, 24.8)	37.3	(29.9, 45.4)	49.1	(30.3, 68.2)	
	some college	22.9	(20.7, 25.2)	21.9	(17.2, 27.6)	28.1	(14.9, 46.7)	
	BA	31.5	(28.9, 34.2)	22.3	(17.2, 28.4)	NSF		
	Graduate or professional degree	15.8	(14.3, 17.5)	12.4	(9.4, 16.1)	NSF		
	PHD	3.1	(2.5, 4.0)	NSF		0.0	NA	
Education (collapsed)	HS or less	26.7	(23.6, 30.0)	40.8	(33.4, 48.6)	54.5	(35.7, 72.1)	0.0002
	Some college/BA	54.4	(51.4, 57.3)	44.3	(37.4, 51.3)	41.5	(24.9, 60.2)	
	Graduate school or higher	18.9	(17.2, 20.8)	15.0	(11.6, 19.1)	NSF		
Employment	1=employed	64.8	(61.9, 67.6)	63.8	(56.8, 70.3)	55.5	(35.9, 73.6)	0.1030
	2=unemployed	4.3	(3.1, 5.9)	NSF		NSF		
	3=homemaker	1.9	(1.3, 2.7)	NSF		NSF		
	4=student	6.0	(4.5, 8.0)	NSF		NSF		
	5=retired	19.5	(17.5, 21.7)	22.5	(17.5, 28.5)	NSF		
	6=disabled	3.6	(2.6, 4.9)	NSF		NSF		
Income	1=Less than $15,000	7.6	(5.9, 9.7)	9.3	(5.8, 14.6)	NSF		0.0010
	2=$15,000-<$30,000	8.8	(7.1, 10.7)	14.7	(9.5, 22.1)	NSF		
	3=$30,000-<$50,000	12.8	(10.6, 15.3)	11.4	(7.6, 16.6)	NSF		
	4=$50,000-<$100,000	27.1	(24.3, 30.0)	24.3	(18.2, 31.7)	NSF		
	5=$100,000-<$150,000	18.4	(16.1, 20.9)	19.6	(14.3, 26.1)	NSF		
	6=$150,000 and more	25.3	(22.7, 28.2)	20.8	(15.3, 27.6)	NSF		
Income collapsed	<$50K	29.2	(26.2, 32.3)	35.4	(28.3, 43.1)	60.6	(38.8, 78.9)	0.0120
	>=$50K	70.8	(67.7, 73.8)	64.6	(56.9, 71.7)	39.4	(21.1, 61.2)	
Marital status	1=Never married	22.9	(20.3, 25.7)	21.0	(15.7, 27.4)	55.8	(36.6, 73.4)	0.0157
	2=Living with partner	10.3	(8.6, 12.2)	12.9	(8.6, 19.1)	NSF		
	3=Married	51.5	(48.6, 54.5)	48.6	(41.4, 55.9)	NSF		

		Recreational gambler		At-risk gambler		Problem gambler		
		%	95% CI	%	95% CI	%	95% CI	p-value
	4=Divorced or Separated	9.5	(8.0, 11.3)	12.0	(8.0, 17.5)	NSF		
	5=Widowed	5.8	(4.6, 7.2)	5.5	(3.2, 9.2)	NSF		
Military status	Yes, now on active duty	NSF		NSF		NSF		0.8636
	Yes, on active duty in the past	6.6	(5.2, 8.3)	7.4	(4.7, 11.5)	NSF		
	No, training for Reserves or National Guard only	1.5	(0.9, 2.5)	NSF		NSF		
	No, never served in the military	91.4	(89.5, 93.0)	88.7	(83.1, 92.7)	87.2	(74.5, 94.1)	
Drug and alcohol use problems	Yes	2.8	(2.0, 3.9)	NSF		NSF		0.2959
Tobacco Use	1=no	88.1	(86.0, 90.0)	81.9	(75.8, 86.7)	63.1	(42.2, 80.1)	0.0159
	2=yes	11.9	(10.0, 14.0)	18.1	(13.3, 24.2)	36.9	(19.9, 57.8)	
Self reported Health status	Excellent	14.3	(12.6, 16.3)	13.3	(8.9, 19.3)	NSF		0.0043
	Very Good	37.3	(34.6, 40.0)	27.5	(22.2, 33.7)	NSF		
	Good	33.3	(30.7, 36.1)	40.7	(33.9, 47.9)	40.5	(23.7, 59.8)	
	Fair	12.7	(10.9, 14.9)	17.0	(11.7, 24.0)	32.9	(17.9, 52.5)	
	Poor	2.3	(1.5, 3.6)	NSF		NSF		

Percentages and 95% CI are calculated using the weighted N7
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 78. Reasons for gambling by gambling group

	Recreational gambler		At-risk/problem gambler		
	%	95% CI	%	95% CI	p-value
Unweighted N[1]	2511		531		
Weighted N[2]	2,395,625		510,668		
For excitement/entertainment	27.3	(24.6, 30.1)	40.8	(34.1, 47.8)	<0.0001
To win money	31.7	(28.9, 34.8)	39.9	(33.3, 46.9)	
To escape or distract yourself	2.3	(1.3, 3.9)	3.9	(2.5, 6.1)	
To socialize with family or friends	18.3	(16.0, 20.8)	10.1	(6.5, 15.6)	
To support worthy causes	6.9	(5.7, 8.4)		NSF	
Because it makes you feel good		NSF		NSF	
Other	13.0	(11.1, 15.1)		NSF	

Percentages and 95% CI are calculated using the weighted N
P-value from chi-square test for differences across groups
Note: Insufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 79. Reported expenditures by gambling group

	Total	Expenditures - Recreational	% - Recreational	Expenditures- At risk	% - At risk		Expenditures - Problem	% - Problem
All Gambling	$3,803	$471	12%	$2,575	68%	*	$757	20%

Reported in millions of dollars

* Estimate is unreliable, relative standard error > 30%

Table 80. Portion of family and friends who are regular gamblers by gambling group

		Recreational Gambler		At-risk gambler		Problem Gambler		
		%	95% CI	%	95% CI	%	95% CI	
Unweighted N		2,953		475		86		
Weighted N		2,792,337		464,290		77,521		
Portion of family/friends regular gamblers	**None**	48.3	(45.4, 51.2)	30.3	(24.1, 37.3)	20.3	(11.0, 34.4)	<0.0001
	Some	50.1	(47.2, 53.0)	61.8	(54.6, 68.5)	40.9	(25.0, 59.0)	
	Most or all	1.6	(1.1, 2.4)	7.9	(4.9, 12.4)	38.8	(21.5, 59.6)	

Unweighted N refers to the total number of respondents who answered this question

Weighted N is the total number of respondents who answered the question weighted to the MA population

Percentages and 95% CI are calculated using the weighted N

P-value from chi-square test for differences across groups

Table 81. Alcohol and drug use by gambler group

		Recreational gambler		At-risk gambler		Problem gambler		
		%	95% CI	%	95% CI	%	95% CI	p-value
Unweighted N		2,953		475		86		
Weighted N		2,792,337		464,290		77,521		
Alcohol use	not in past year	24.1	(21.7, 26.7)	20.0	(15.3, 25.8)	40.7	(24.8, 58.9)	0.1622
	did not report alcohol use in past 30	4.3	(3.3, 5.5)		NSF		NSF	
	Yes, in past 30 days	71.6	(69.0, 74.2)	74.7	(68.4, 80.2)	53.1	(35.1, 70.3)	
Problems with alcohol or drug use (past 12 months)	No	97.2	(96.4, 97.8)	97.9	(95.8, 98.9)	94.1	(86.7, 97.5)	0.5185
	Yes, but did not seek help	1.9	(1.2, 3.0)		NSF		NSF	
	Yes and sought help	0.8	(0.5, 1.4)		NSF		---	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
P-value from chi-square test for differences across groups

Appendix H: Awareness of Problem Gambling Services in Massachusetts

Table 82. Prevention awareness by PPGM

		Total		Non gambler		Recreational Gambler		At-risk gambler		Problem Gambler		
		%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	p-value
Unweighted N		6,089		2,575		2,953		475		86		
Weighted N		5,438,926		2,104,778		2,792,337		464,290		77,521		
Seen or heard media campaigns to prevent gambling problems in Massachusetts in past 12 months	No	79.1	(77.4, 80.7)	88.8	(86.5, 90.7)	73.8	(71.2, 76.3)	68.9	(62.1, 74.9)	66.6	(47.0, 81.8)	<0.0001
	Yes	20.9	(19.3, 22.6)	11.2	(9.3, 13.5)	26.2	(23.7, 28.8)	31.1	(25.1, 37.9)	33.4	(18.2, 53.0)	
Aware of programs to prevent problem gambling offered at school, work, community or elsewhere in past 12 months	No	90.8	(89.5, 91.9)	94.9	(93.1, 96.2)	89.3	(87.4, 91.0)	82.5	(76.1, 87.4)	80.7	(58.7, 92.5)	<0.0001
	Yes	9.2	(8.1, 10.5)	5.1	(3.8, 6.9)	10.7	(9.0, 12.6)	17.5	(12.6, 23.9)		NSF	

Unweighted N refers to the total number of respondents who answered this question
Weighted N is the total number of respondents who answered the question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
P-value from chi-square test for differences across groups

Table 83. Awareness of media campaigns by demographics

					In the past 12 months, seen or heard any media campaigns to prevent problem gambling in Massachusetts				
					No		Yes		
		Unweighted N	Weighted N	% missing	%	95% CI	%	95% CI	p-value
Overall		6,199	5,550,618		79.2	(77.5, 80.8)	20.8	(19.2, 22.5)	
	Missing	94	72,291	1%					
Gender									<0.0001
	Male	2,499	2,571,821		74.2	(71.3, 77.0)	25.8	(23.0, 28.7)	
	Female	3,562	2,867,521		83.3	(81.3, 85.1)	16.7	(14.9, 18.7)	
	Other	39	40,549		89.3	(68.5, 97.0)		NSF	
	Missing	99	70,727	1%					
Age									<0.0001
	18-20	103	153,621		96.0	(88.7, 98.7)		NSF	
	21-24	260	364,773		91.5	(85.2, 95.2)	8.5	(4.8, 14.8)	
	25-34	983	955,903		78.4	(73.5, 82.6)	21.6	(17.4, 26.5)	
	35-54	1,819	1,506,660		78.6	(75.2, 81.6)	21.4	(18.4, 24.8)	
	55-64	966	974,042		73.0	(68.3, 77.3)	27.0	(22.7, 31.7)	
	65-79	1,191	870,770		76.3	(72.5, 79.8)	23.7	(20.2, 27.5)	
	80+	294	269,030		85.5	(78.9, 90.3)	14.5	(9.7, 21.1)	
	Missing	583	455,819	9%					
Ethnicity									<0.0001
	Hispanic	848	589,589		87.6	(83.7, 90.8)	12.4	(9.2, 16.3)	
	Black	631	379,998		79.9	(72.6, 85.7)	20.1	(14.3, 27.4)	
	White	3,227	3,722,023		75.9	(73.6, 78.0)	24.1	(22.0, 26.4)	
	Asian	887	393,201		92.3	(89.1, 94.6)	7.7	(5.4, 10.9)	
	Other	50	46,153		74.2	(43.9, 91.4)		NSF	
	Missing	556	419,655	8%					
Education									0.0010
	Less than high school	183	295,932		89.7	(81.5, 94.6)		NSF	
	HS or GED	623	1,261,630		78.9	(73.9, 83.2)	21.1	(16.8, 26.1)	
	Some college	1,380	1,079,062		78.7	(75.2, 81.8)	21.3	(18.2, 24.8)	
	BA	1,646	1,589,115		75.8	(72.6, 78.7)	24.2	(21.3, 27.4)	
	MS or professional degree	1,587	853,527		80.3	(77.4, 82.9)	19.7	(17.1, 22.6)	
	PHD	459	240,238		85.7	(79.9, 90.0)	14.3	(10.0, 20.1)	
	Missing	321	231,114	4%					
Employment									0.0108
	1=employed	3,621	3,251,029		78.3	(76.0, 80.4)	21.7	(19.6, 24.0)	
	2=unemployed	205	201,181		73.8	(60.7, 83.7)	26.2	(16.3, 39.3)	
	3=homemaker	134	126,475		81.9	(69.4, 90.0)	18.1	(10.0, 30.6)	
	4=student	384	423,839		89.5	(82.9, 93.7)	10.5	(6.3, 17.1)	
	5=retired	1,242	1,025,036		78.8	(75.2, 82.1)	21.2	(17.9, 24.8)	
	6=disabled	235	228,671		79.0	(68.7, 86.6)	21.0	(13.4, 31.3)	
	Missing	378	294,388	6%					
Income									<0.0001
	1=Less than $15,000	442	445,724		82.0	(74.6, 87.7)	18.0	(12.3, 25.4)	
	2=$15,000-<$30,000	483	479,975		83.3	(77.6, 87.8)	16.7	(12.2, 22.4)	

		Unweighted N	Weighted N	% missing	In the past 12 months, seen or heard any media campaigns to prevent problem gambling in Massachusetts: No %	No 95% CI	Yes %	Yes 95% CI	p-value
	3=$30,000-<$50,000	624	566,616		85.8	(80.8, 89.7)	14.2	(10.3, 19.2)	
	4=$50,000-<$100,000	1,352	1,173,178		77.3	(73.2, 81.0)	22.7	(19.0, 26.8)	
	5=$100,000-<$150,000	879	772,667		70.9	(66.1, 75.2)	29.1	(24.8, 33.9)	
	6=$150,000 and more	1,107	1,004,497		74.5	(70.2, 78.4)	25.5	(21.6, 29.8)	
	Missing	1,312	1,107,960	25%					
Marital status									0.1778
	1=Never married	1,516	1,366,329		81.8	(77.9, 85.2)	18.2	(14.8, 22.1)	
	2=Living with partner	538	554,602		77.8	(72.1, 82.6)	22.2	(17.4, 27.9)	
	3=Married	2,733	2,531,835		76.9	(74.4, 79.3)	23.1	(20.7, 25.6)	
	4=Divorced or Separated	666	497,241		79.5	(73.7, 84.2)	20.5	(15.8, 26.3)	
	5=Widowed	343	298,677		82.1	(75.3, 87.3)	17.9	(12.7, 24.7)	
	Missing	403	301,934	6%					
Military status									0.7903
	Yes, now on active duty	17	20,176		74.8	(41.9, 92.5)		NSF	
	Yes, on active duty in the past	281	300,727		77.4	(69.2, 84.0)	22.6	(16.0, 30.8)	
	No, training for Reserves or National Guard only	78	82,860		72.4	(54.4, 85.2)	27.6	(14.8, 45.6)	
	No, never served in the military	5,516	4,913,504		79.3	(77.5, 81.0)	20.7	(19.0, 22.5)	
	Missing	307	233,351	4%					

Unweighted N refers to the total number of respondents who selected this category for this question
Weighted N is the total number of respondents who selected this category for this question weighted to the MA population
Percentages and 95% CI are calculated using the weighted N
The % missing is calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%

Table 84. Awareness of other prevention campaigns by demographics

					In the past 12 months, aware of any programs to prevent problem at school, work, community or elsewhere				
					No		Yes		
		Unweighted N	Weighted N	% missing	%	95% CI	%	95% CI	p-value
Overall		6,174	5,527,207		90.9	(89.6, 92.0)	9.1	(8.0, 10.4)	
	Missing	119	95,702	2%					
Gender									0.0548
	Male	2,494	2,562,595		89.4	(87.3, 91.3)	10.6	(8.7, 12.7)	
	Female	3,544	2,853,635		92.1	(90.5, 93.5)	7.9	(6.5, 9.5)	
	Other	38	40,399		95.2	(84.0, 98.7)	*	NSF	
	Missing	123	93,989	2%					
Age									0.7491
	18-20	104	156,135		95.4	(85.9, 98.6)	*	NSF	
	21-24	260	364,773		90.1	(82.4, 94.7)	*	NSF	
	25-34	980	951,093		90.3	(86.6, 93.0)	9.7	(7.0, 13.4)	
	35-54	1,811	1,492,458		90.6	(88.1, 92.6)	9.4	(7.4, 11.9)	
	55-64	960	966,251		90.2	(86.8, 92.7)	9.8	(7.3, 13.2)	
	65-79	1,188	873,015		91.0	(87.9, 93.4)	9.0	(6.6, 12.1)	
	80+	293	269,211		92.6	(85.1, 96.5)	*	NSF	
	Missing	603	477,682	9%					
Ethnicity									0.0027
	Hispanic	844	581,987		92.9	(89.5, 95.3)	7.1	(4.7, 10.5)	
	Black	628	382,023		90.4	(85.8, 93.7)	9.6	(6.3, 14.2)	
	White	3,220	3,707,213		89.9	(88.1, 91.4)	10.1	(8.6, 11.9)	
	Asian	884	391,350		95.5	(92.5, 97.4)	4.5	(2.6, 7.5)	
	Other	49	46,003		93.6	(84.6, 97.5)	*	NSF	
	Missing	574	442,042	9%					
Education									0.0033
	Less than high school	179	287,087		94.2	(87.4, 97.4)	*	NSF	
	HS or GED	619	1,252,097		90.6	(86.7, 93.4)	9.4	(6.6, 13.3)	
	Some college	1,375	1,079,085		91.2	(88.3, 93.4)	8.8	(6.6, 11.7)	
	BA	1,643	1,584,460		89.1	(86.6, 91.2)	10.9	(8.8, 13.4)	
	MS or professional degree	1,584	853,224		91.4	(89.3, 93.1)	8.6	(6.9, 10.7)	
	PHD	459	241,449		95.8	(92.9, 97.5)	4.2	(2.5, 7.1)	
	Missing	340	253,217	5%					
Employment									0.0734
	1=employed	3,607	3,231,508		90.4	(88.7, 91.9)	9.6	(8.1, 11.3)	
	2=unemployed	206	202,266		88.3	(79.0, 93.8)	*	NSF	
	3=homemaker	134	126,475		96.7	(90.5, 98.9)	*	NSF	
	4=student	385	426,353		91.9	(85.1, 95.8)	*	NSF	
	5=retired	1,237	1,025,143		91.4	(88.5, 93.6)	8.6	(6.4, 11.5)	
	6=disabled	234	222,698		87.2	(78.1, 92.8)	12.8	(7.2, 21.9)	
	Missing	396	316,174	6%					
Income									0.8218
	1=Less than $15,000	439	441,762		90.2	(84.2, 94.1)	9.8	(5.9, 15.8)	
	2=$15,000-<$30,000	480	471,776		91.9	(87.9, 94.6)	8.1	(5.4, 12.1)	

		Unweighted N	Weighted N	% missing	In the past 12 months, aware of any programs to prevent problem at school, work, community or elsewhere: No %	No 95% CI	Yes %	Yes 95% CI	p-value
	3=$30,000-<$50,000	626	568,679		91.2	(85.9, 94.6)	8.8	(5.4, 14.1)	
	4=$50,000-<$100,000	1,351	1,171,470		89.9	(86.6, 92.4)	10.1	(7.6, 13.4)	
	5=$100,000-<$150,000	878	772,577		89.0	(85.5, 91.8)	11.0	(8.2, 14.5)	
	6=$150,000 and more	1,104	1,003,119		89.1	(85.8, 91.7)	10.9	(8.3, 14.2)	
	Missing	1,321	1,121,234	25%					
Marital status									0.1958
	1=Never married	1,513	1,365,797		91.0	(88.0, 93.2)	9.0	(6.8, 12.0)	
	2=Living with partner	534	549,474		88.4	(82.9, 92.2)	11.6	(7.8, 17.1)	
	3=Married	2,724	2,519,426		91.4	(89.6, 92.9)	8.6	(7.1, 10.4)	
	4=Divorced or Separated	664	491,661		87.5	(82.4, 91.2)	12.5	(8.8, 17.6)	
	5=Widowed	341	297,748		94.0	(88.5, 96.9)	*	NSF	
	Missing	423	326,511	6%					
Military status									0.0659
	Yes, now on active duty	17	20,176		71.6	(38.9, 90.9)	*	NSF	
	Yes, on active duty in the past	281	300,727		86.0	(78.5, 91.2)	14.0	(8.8, 21.5)	
	No, training for Reserves or National Guard only	77	82,386		76.3	(56.0, 89.1)	*	NSF	
	No, never served in the military	5,501	4,896,670		91.4	(90.0, 92.5)	8.6	(7.5, 10.0)	
	Missing	323	250,659	5%					

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The % missing is calculated using the weighted N
Note: Not Sufficient Information (NSF) indicates estimates are unreliable, relative standard error > 30%