



UNIVERSITY OF MASSACHUSETTS SCHOOL OF PUBLIC HEALTH AND HEALTH SCIENCES

A 6 YEAR LONGITUDINAL STUDY OF GAMBLING & PROBLEM GAMBLING IN MASSACHUSETTS

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RESEARCH TEAM

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MAGIC

- **Massachusetts Gambling Impact Cohort (MAGIC) is the first major cohort study of gambling in the United States**
- Began in 2013



Research Goals

1. Monitor changes in level of gambling and problem gambling over time within the cohort that might identify **impacts of MA-casino introduction**.
2. Determine **stability and course** of problem, at-risk, and recreational gambling.
3. Identify predictors of problem gambling onset, continuation, remission, and relapse for the purposes of developing an **etiological model of problem gambling**.
4. **Operationalize above findings to optimize treatment and prevention** of problem gambling in MA.



Details of Each Wave

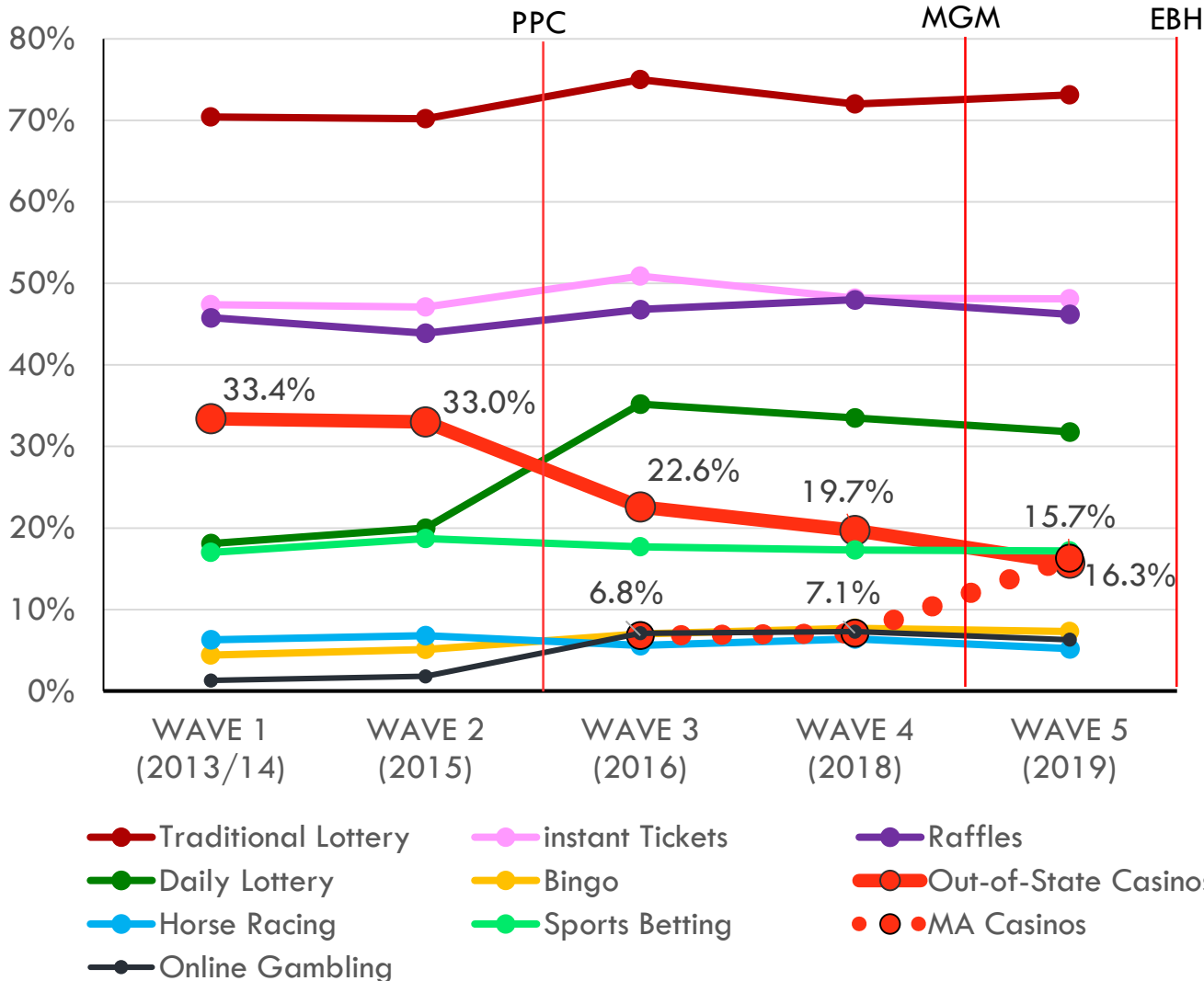
Wave	95% Assessment Window	Complete	Response/Retention
1	Sep 2013 – Apr 2014	3,096	36.6% response
2	Mar – Jun 2015	3,139	65.1% response
<i>Jun 24, 2015: Opening of Plainridge Park Casino (PPC)</i>			
3	Apr – Jul 2016	2,450	78.1% retention
4	<i>Postponed due to budgetary constraints</i>		
4	Apr – Jun 2018	2,444	81.1% retention
<i>Aug 24, 2018: Opening of MGM Springfield (MGM)</i>			
5	Mar – Jun 2019	2,382	79.7% retention
<i>Jun 23, 2019: Opening of Encore Boston Harbor (EBH)</i>			

- Wave 1 over-selected for at-risk characteristics: all problem gamblers, at-risk gamblers, weekly gamblers, >\$1200 past year gambling expenditure, military service.
- Limited number of variables assessed in Wave 1 and 2; comprehensive set included in Waves 3 – 5.

CHANGES IN LEVEL OF GAMBLING AND
PROBLEM GAMBLING WITHIN THE
COHORT THAT MIGHT IDENTIFY IMPACTS
OF MA-CASINO INTRODUCTION



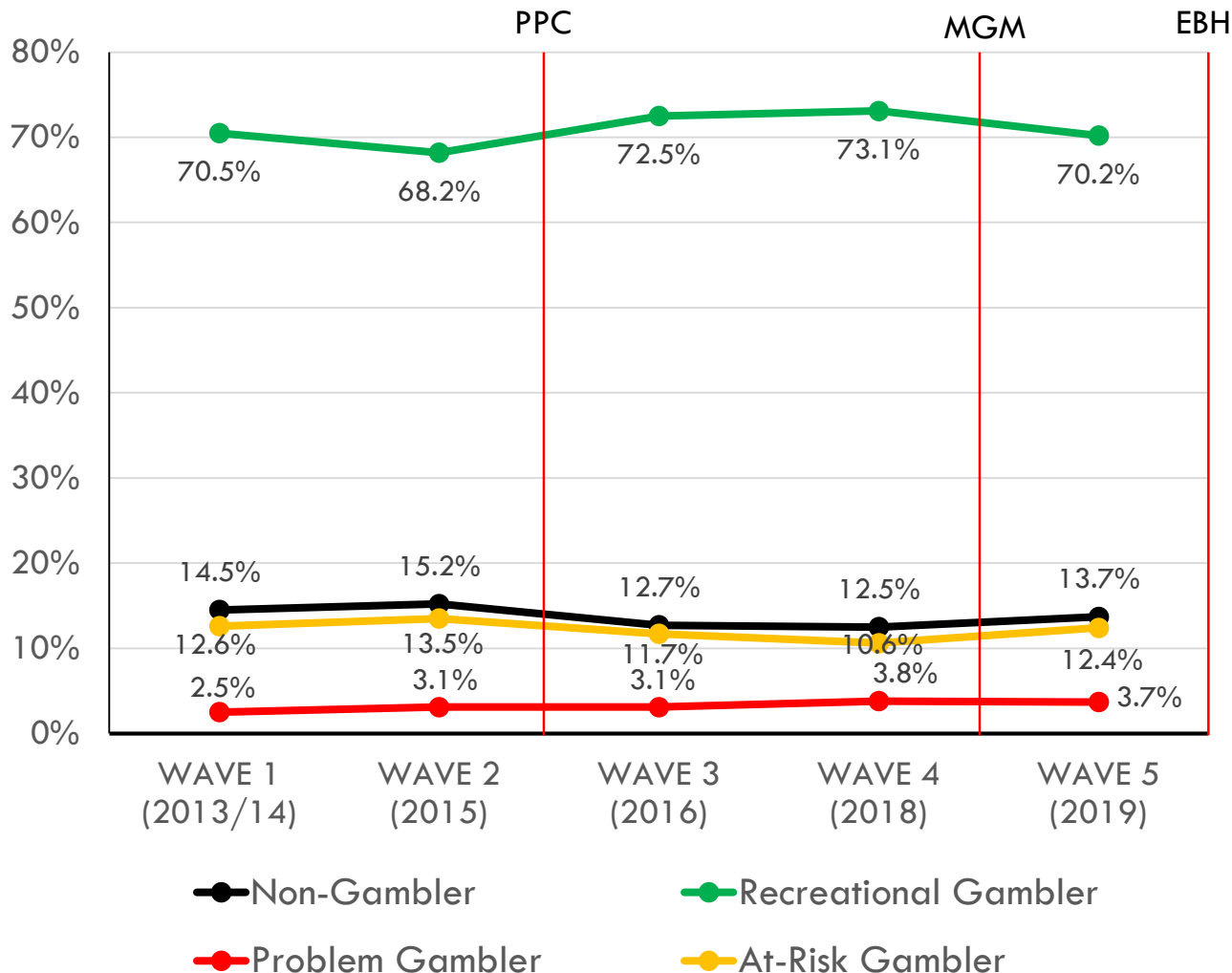
Gambling Participation within the Cohort Across Waves



- Wave 3 → 5 decrease in out-of-state casinos and increase in MA casinos due to MA-casino introduction.
- No negative impact on lottery participation.
- Wave 3 increase in daily lottery, online gambling likely artifactual due to change in question wording.

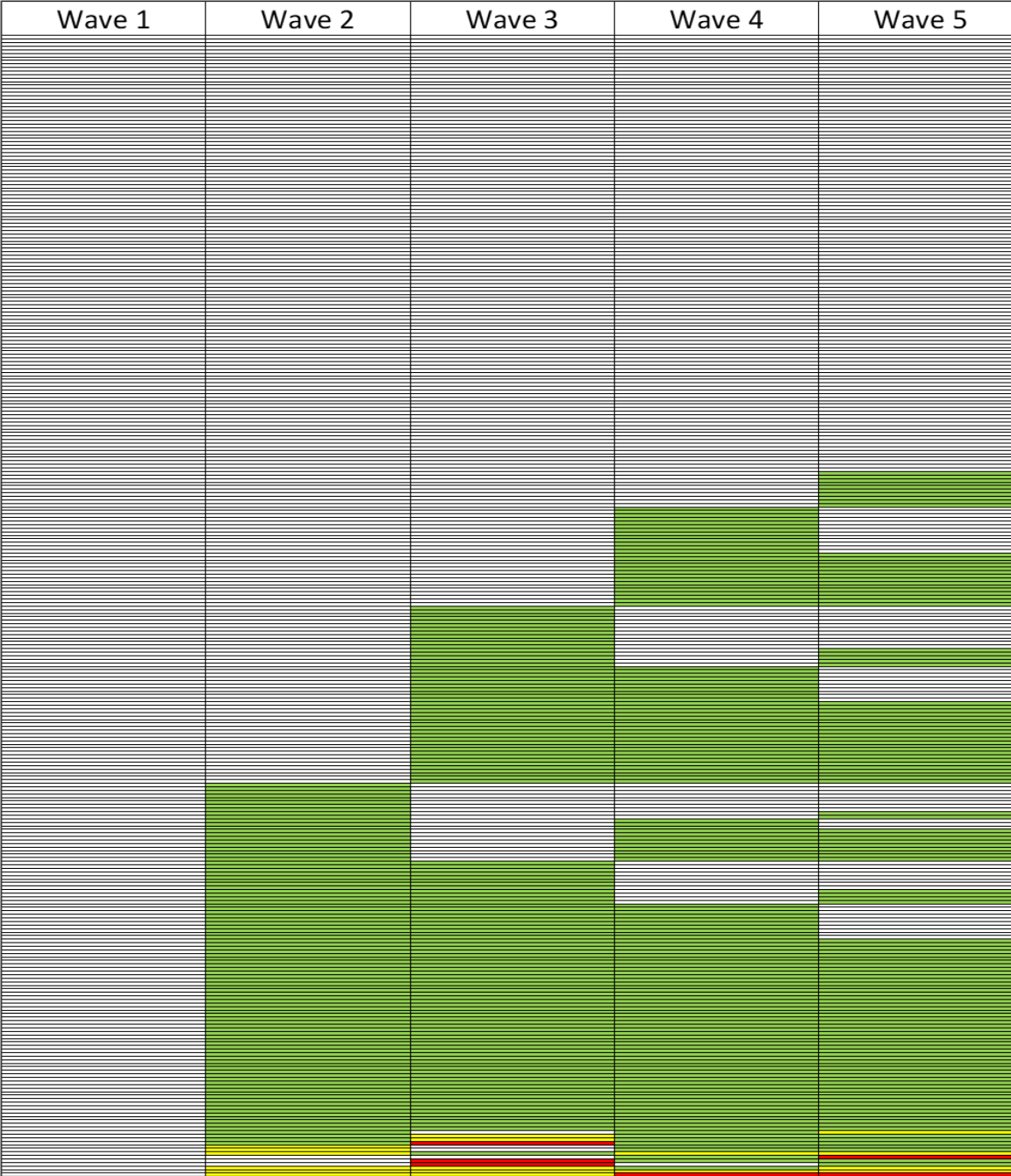


Gambling Categorizations within the Cohort Across Waves



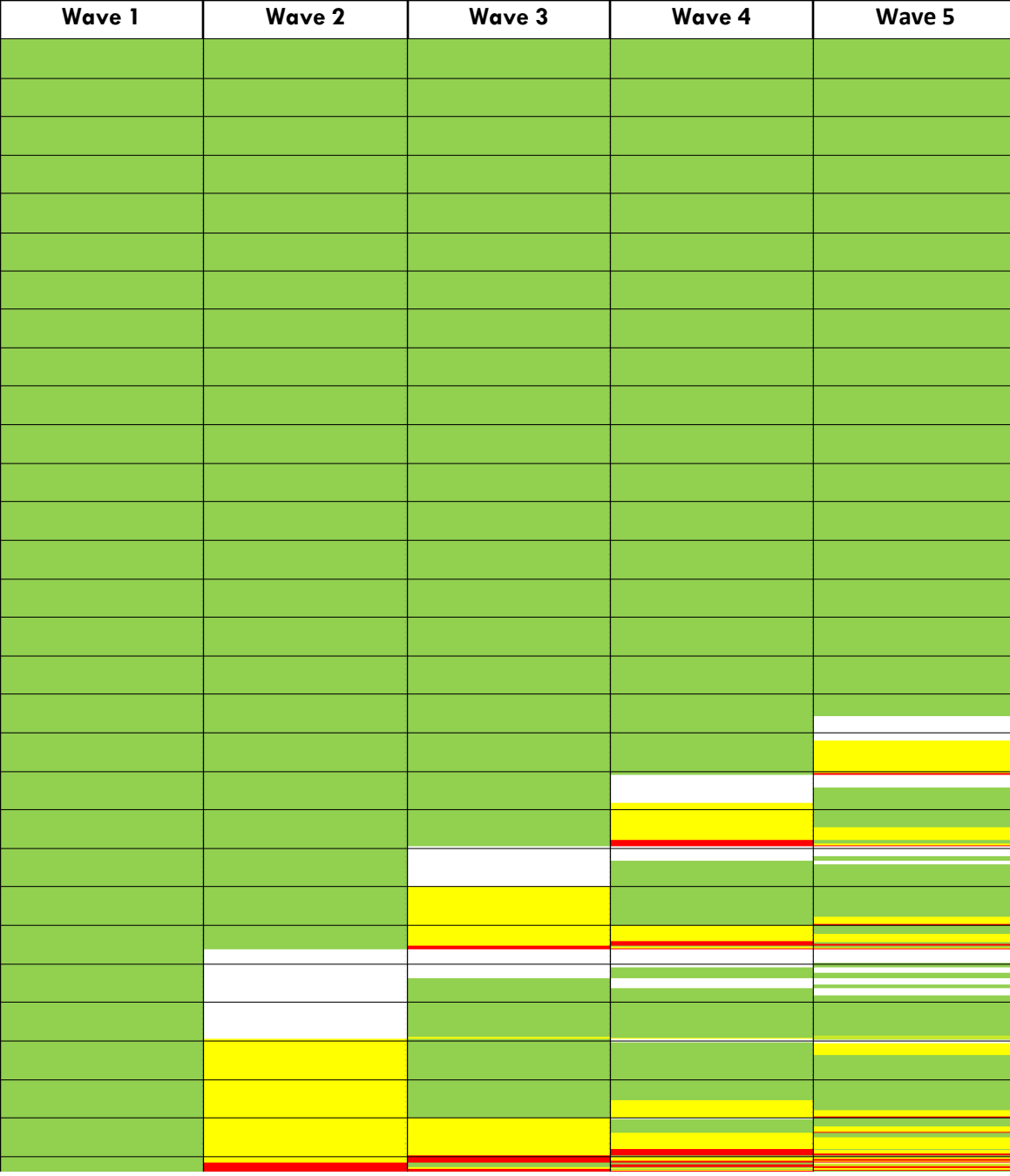
- Wave 3 increase in **Recreational Gambling** likely due to 2016 Powerball jackpot.
- Wave 4 & 5 increase in **Problem Gambling** potentially related to casino introduction, but perhaps not their physical availability.

**INDIVIDUAL STABILITY OF NON-
GAMBLING, RECREATIONAL GAMBLING,
AT-RISK GAMBLING AND PROBLEM
GAMBLING ACROSS WAVES**



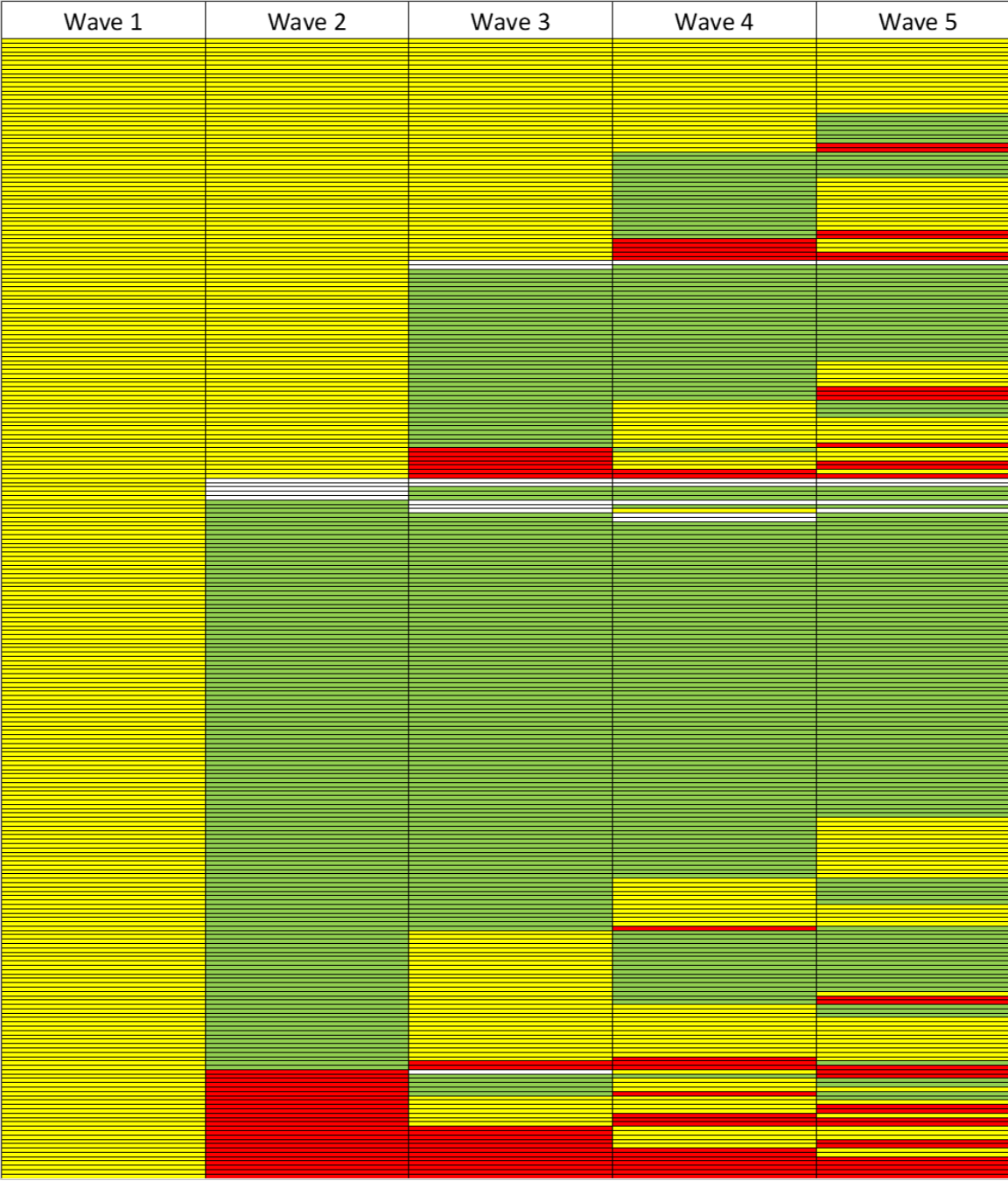
- N = 322; each row represents an individual
- **NON-GAMBLING** a fairly stable category, with majority in one wave continuing to be Non-Gamblers at the next wave.
- However, only minority Non-Gamblers in all 5 waves. Majority transitioned to Recreational Gambling in Wave 2, 3, 4, or 5 with minority transitioning back to Non-Gambling in following wave.

Non-Gambler	Recreational Gambler	At-Risk Gambler	Problem Gambler
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Non-Gambler	Recreational Gambler	At-Risk Gambler	Problem Gambler
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- N = 1472; each row represents 50 individuals
- **RECREATIONAL GAMBLING** a very stable category, with large majority continuing to be Recreational Gamblers in the next wave, and most being Recreational Gamblers in all five waves.
- Small percentage transitioned into Non-Gambling or At-Risk Gambling and an even smaller percentage (3.9%) became Problem Gamblers.



- $N = 262$; each row represents an individual
- **AT-RISK GAMBLING** an unstable category, with minority being in same category in the next wave and only small minority continuing in this category for four consecutive waves.
- Although a significant percentage of At-Risk Gamblers subsequently become Problem Gamblers (19.8%), a much more common route was transitioning back to Recreational Gambling.

Non-Gambler	Recreational Gambler	At-Risk Gambler	Problem Gambler
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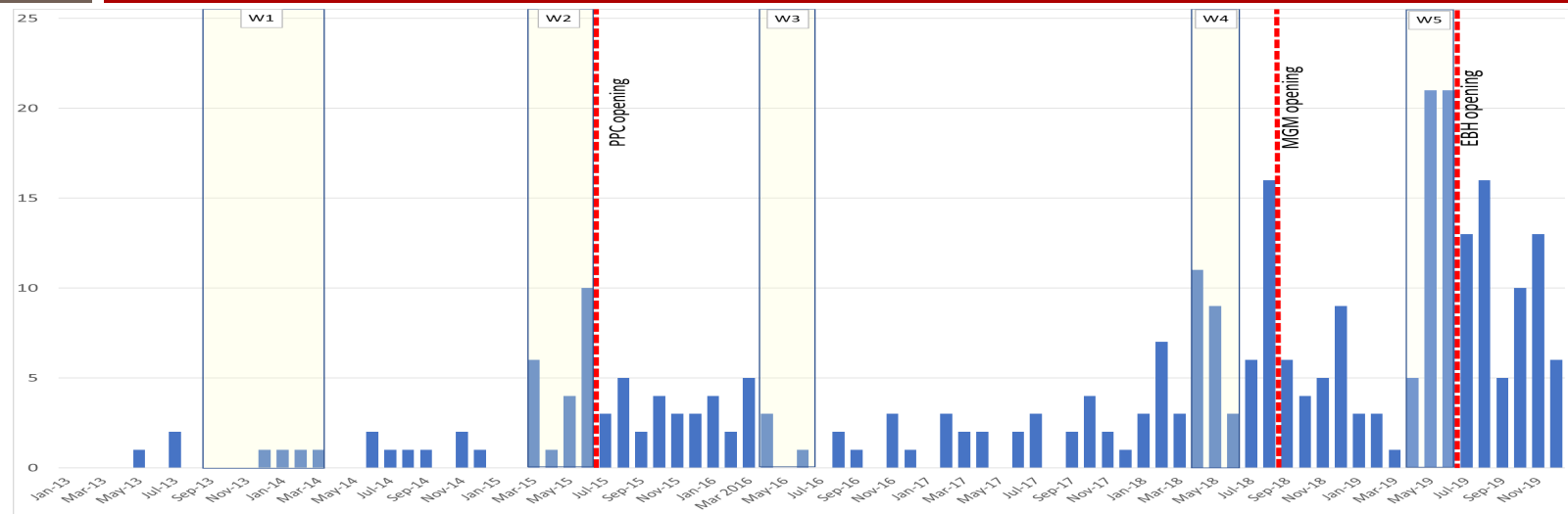


- N = 168; each row represents an individual
- **PROBLEM GAMBLING** somewhat more stable than At-Risk Gambling, but still fairly unstable, with majority transitioning to At-Risk or Recreational Gambling in next wave.
- One year the modal duration of PG, occurring in 53.0%, with only 6% being PGs in all 5 waves. Risk of chronicity increased with each consecutive year of PG status.
- At-Risk Gambling preceded PG 69% of the time.
- High remission and relapse rates.
- Increase in PG in Wave 4 due to increasing relapse rates (77% of PGs in Wave 5 were relapsed PGs). This increase occurred prior to MGM & Encore opening.

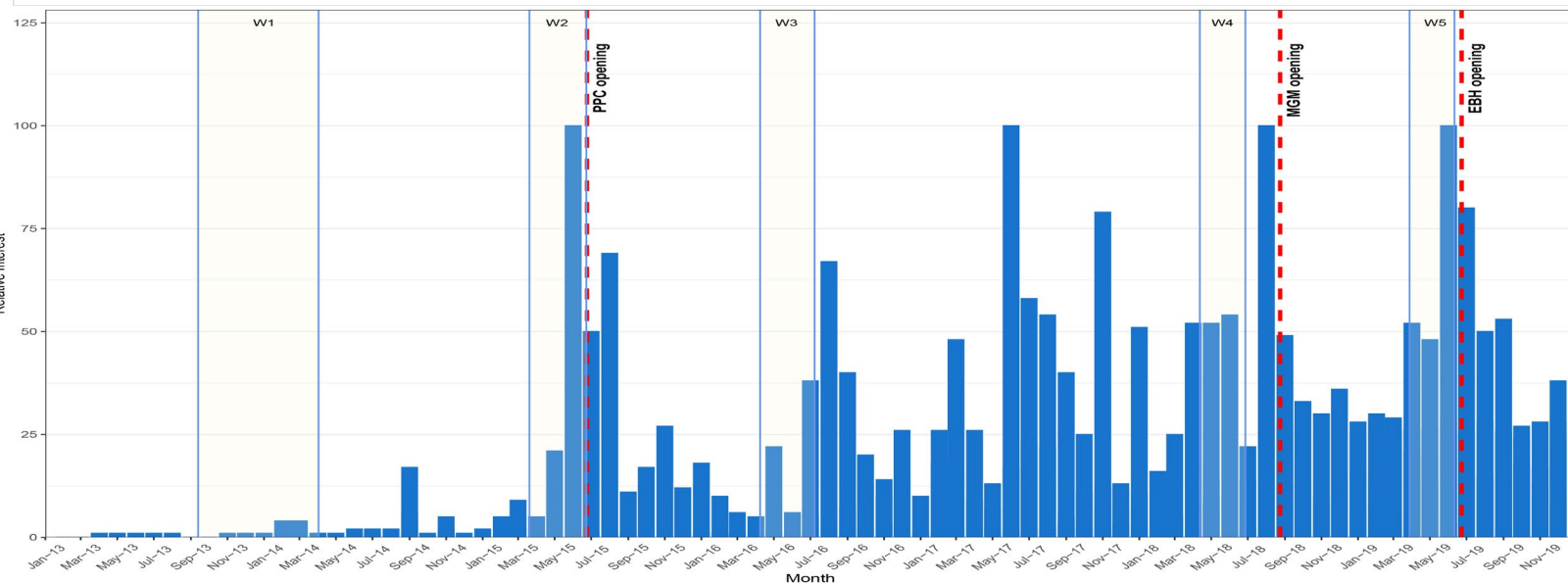
Non-Gambler	Recreational Gambler	At-Risk Gambler	Problem Gambler
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News Stories and Google Searches for PPC, MGM, WBH/EBH from 2013-2019



News Stories



Google Searches

**BIVARIATE & MULTIVARIATE PREDICTORS
OF CONCURRENT AND FUTURE
PROBLEM GAMBLING**



Method

- Discrete *and* Continuous Dependent Variable (DV)
 - ▣ PPGM Problem Gambler Status (discrete)
 - ▣ PPGM Total Score (continuous)

- 105 Independent Variables (IV)
 - ▣ *Everything* significantly related to problem gambling in prior research

- Concurrent *and* Lagged Analysis
 - ▣ IVs predicting DV in same wave *and* in the next wave

- Generalized Estimating Equations
 - ▣ Bivariate relationship between each IV and DV over time
 - ▣ Collective multivariate analysis of all significant IVs with the DV over time



Bivariate Results

- 16 variables with no significant concurrent or future relationship with PG:
 - Number of children under 18 in the household
 - Importance of religion
 - 3 Attitudes toward gambling (perceived benefit or harm; types that should be legal; whether gambling too widely available in MA)
 - Alcohol use in past 30 days
 - Main reason for gambling: makes me feel good about myself
 - Awareness of PG prevention programs at work, school, or in community
 - *Age*
 - *Marital status*
 - *Born in the United States*
 - *Distance from home to closest electronic gambling machine (EGM) or table game venue*
 - *Level of stress in the past 12 months*
 - *Physical, sexual or emotional abuse as a child*
 - **Employment status**
 - **Having served in the military**

*Italicized variables are ones that have been significant in other research; **bolded variables** are ones significant ($p < .01$) in the MA Baseline General Population Survey in 2013/2014*



Bivariate Results

- 67 variables with significant concurrent and lagged bivariate relationship with problem gambling
- Additional 22 variables with significant concurrent or lagged bivariate relationship with problem gambling



Bivariate Results

- **Strongest IVs with both a concurrent and future relationship with problem gambling were gambling-related variables:**
 - Biggest loss in single day
 - Biggest win in single day
 - Intensity of gambling involvement (#formats; frequency; \$)
 - Importance of gambling as recreational activity
 - Current gambling category (non-gambler, recreational gambler, at-risk gambler, problem gambler)



Bivariate Results

- Many other strong variables robustly predictive both concurrently and prospectively:
 - Instant lottery participation
 - Traditional lottery participation
 - Daily lottery participation
 - Higher psychopathy/antisociality
 - Family member been a regular gambler
 - Current substance use disorder (DSM-5)
 - Lifetime history of drug or alcohol problems
 - Lifetime history of behavioral addiction
 - Greater portion of friends and family that are regular gamblers
 - Higher impulsivity



Bivariate Results

- Many other strong variables robustly predictive both concurrently and prospectively:
 - Higher level of gambling fallacies
 - Higher number of significant life events in past 12 months
 - Younger age when first gambled for money
 - Higher number of financial/property events in past 12 months
 - Casino participation
 - Race/ethnicity (Black, Hispanic)
 - Lower educational attainment
 - Lower self-rated happiness
 - Higher excitement seeking
 - Lower agreeableness



Bivariate Results

- Many other strong variables robustly predictive both concurrently and prospectively:
 - Lower household income
 - Higher rating for 'wealth a good measure of success in life'
 - Any past year DSM-5 mental disorder
 - Sports betting participation
 - Having a criminal record
 - Higher number of health life events in past 12 months
 - Tobacco user past 30 days
 - Higher levels of neuroticism
 - Higher number of friends/family life events in past 12 months
 - Higher levels of vulnerability



Bivariate Results

- Many other strong variables robustly predictive both concurrently and prospectively:
 - Poorer general health in past 12 months
 - Poorer rating of current marital relationship
 - Typically gamble alone rather than with friends
 - Higher current debt
 - Parents not responsibly modelling gambling or providing education
 - Online gambling participation
 - Electronic gambling machine participation
 - Significant family history of addiction or mental health problems
 - Lifetime history of mental health problems
 - 'Private gambling' participation



Bivariate Results

- Many other strong variables robustly predictive both concurrently and prospectively:
 - ‘Other types’ of gambling participation
 - Major Depression (DSM-5)
 - Bingo participation
 - Main reason for gambling to socialize or to support worthy causes (-ve)
 - Horse race betting
 - Lower conscientiousness
 - Non-medical use of drugs in past 12 months
 - Male gender
 - Committed illegal activities in past year
 - Generalized Anxiety Disorder (DSM-5)



Multivariate Results

- IVs often correlated with one another (e.g., educational attainment with income with race/ethnicity).
- Consequently, bivariate relationships with the DV do not identify whether there may be specific attribute(s) underlying a range of bivariate associations.
- **Relative importance** of IVs better established in stepwise multivariate analysis where IVs having strongest association with DV enter the model first, and other IVs only enter model if they add additional predictive power beyond their shared variance.



Multivariate Results

- **Strongest IVs with both a concurrent and future relationship** with problem gambling were *again* **gambling-related variables**:
 - ▣ Biggest loss in single day
 - ▣ Biggest win in single day
 - ▣ Intensity of gambling involvement (#formats; frequency; \$)
 - ▣ Importance of gambling as recreational activity
 - ▣ Current gambling category (non-gambler, recreational gambler, at-risk gambler, problem gambler)



Multivariate Results

- **12 other strong variables robustly predictive both concurrently and prospectively:**
 - Higher impulsivity
 - Daily lottery game participation (past 12 months)
 - Instant lottery participation (past 12 months)
 - Higher # of significant property/financial life events (past 12 months)
 - Lower levels of happiness (past 12 months)
 - Lower household income



Multivariate Results

- ❑ **12 other strong variables robustly predictive both concurrently and prospectively:**
 - ❑ Male gender
 - ❑ Traditional lottery participation (past 12 months)
 - ❑ Problems with drugs or alcohol prior to past 12 months
 - ❑ Higher levels of antisociality/psychopathy
 - ❑ Sports betting participation (past 12 months)
 - ❑ Higher levels of gambling fallacies



Predictors of Problem Gambling (PG) Remission

- ❑ Bivariate and multivariate analyses conducted on PGs who remitted vs. continued being PGs in the next wave.

- ❑ Variables that best predicted remission were:
 - ❑ No prior lifetime problems with gambling
 - ❑ Less severe current manifestations of PG (lower PG scores, lower gambling expenditure)
 - ❑ Fewer comorbidities (less impulsivity, absence of behavioral addictions, no illegal activity, no mental disorders, fewer life events)
 - ❑ Fewer gambling fallacies

SUPPLEMENTAL DESCRIPTIVE RESULTS



Supplemental Descriptive Results:

Prevention Awareness

		Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Average
1. Seen/heard media campaigns to prevent problem gambling in MA (past 12 months)? (% yes)		49.2%	50.1%	43.9%	33.6%	34.3%	42.2%
2. Aware of any prevention programs at school, work, in community or elsewhere? (past 12 months) (% yes)		15.1%	16.6%	18.0%	16.5%	17.1%	16.7%
If yes to 2	Did you participate in any of these prevention programs? (% yes)	1.7%	1.2%	1.9%	1.5%	2.5%	1.8%
If yes to 1 or 2	Did these media campaigns or programs alter your gambling behaviors? (% yes)	1.2%	0.8%	1.1%	1.1%	1.2%	1.1%



Supplemental Descriptive Results: *Problematic Types of Gambling for PGs*

		Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Average
Are there particular types of gambling that have contributed to your problems more than others? (% yes)		23.3%	36.5%	53.2%	44.8%	47.5%	41.1%
If yes, which ones?	Instant Lottery Tickets	23.5%	28.6%	66.7%	66.7%	67.9%	50.7%
	Slot Machines or VLTs	--	28.6%	27.3%	23.3%	21.4%	23.6%
	Traditional Lottery Tickets	--	--	24.2%	36.7%	28.6%	23.1%
	Daily Lotteries	--	--	18.2%	20.0%	--	16.2%
	Casino Table Games	--	--	--	--	21.5%	13.3%
	Sports Betting	--	--	--	20.0%	--	11.2%
	Bingo	--	0%	--	--	--	7.6%
	Horse or Dog Race Betting	0%	--	--	0%	0%	--
	High Risk Stocks	0%	0%	--	0%	--	--
	Online Gambling	--	0%	--	0%	0%	--



Supplemental Descriptive Results: *Help Seeking among PGs*

		Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Average
Have you wanted help for gambling problems in the past 12 months? (% yes)		--	7.9%	11.3%	--	--	7.8%
If yes:	Have you sought help for gambling problems in past 12 months? (% yes)	--	--	--	--	--	36.1%
Have you excluded yourself from a casino or slots parlor in past 12 months? (% yes)		12.3%	21.1%	19.4%	19.4%	17.5%	17.9%



Supplemental Descriptive Results: *Self-Reported Causes of PG*

	Wave 3	Wave 4	Wave 5	TOTAL	%
Desire to Win Money	18	18	19	55	30.2%
Boredom/Enjoyment/Excitement	14	13	12	39	21.4%
Denial of Problem	5	7	5	17	9.3%
Stress/Depression/Escape	6	2	6	14	7.7%
Addiction/Poor Self-Control	5	2	6	13	7.1%
Chasing Losses	3	3	1	7	3.8%
Availability of Gambling	3	1	2	6	3.3%
Losing	4	0	2	6	3.3%
Social Pressure	1	2	1	4	2.2%
Don't Know	0	2	1	3	1.6%
Other	5	7	6	18	9.9%
TOTAL	64	57	61	182	100%

POLICY IMPLICATIONS



Policy Recommendations

1. These results largely confirm previous research. Consequently, they **provide a more solid scientific footing for prior recommendations** about how to best prevent problem gambling (e.g., Williams, West & Simpson, 2012).
2. There is no 'silver bullet' to prevent problem gambling. Rather, a **wide array of educational and policy initiatives is needed** to address the multi-faceted biopsychosocial etiology.



Policy Recommendations

3. Because of their etiological connection, **effective treatment of substance abuse and/or mood disorders** will also help reduce the future incidence of problem gambling.
 - For similar reasons, would be useful to screen for gambling problems for people presenting for mental health or substance use problems.
4. Limit the placement of gambling opportunities and the marketing of gambling in **lower socioeconomic neighborhoods**.



Policy Recommendations

5. **Educational efforts** are needed to promote knowledge, motivations, and attitudes conducive to responsible gambling.
- **Demographic Focus:** all ages, race/ethnicities, and genders with extra focus on males and lower income groups.
 - **Location Focus:** media campaigns, school-based programs, mental health and substance abuse clinics, gambling venues, on the gambling product.
 - **Content Focus:**
 - Countering gambling fallacies
 - Risk factors for problem gambling identified in the present research
 - Lower Risk Gambling Guidelines (LRGG)
 - Symptoms of problem gambling and where to get help



Policy Recommendations

6. **Limit advertising** as it potentially precipitates relapse and may counteract educational messaging.
7. **Increase availability of self-help materials**, as only minority of problem gamblers want or will ever seek out formal treatment.
8. **Encourage treatment-seeking**, as people who obtain formal treatment have better long-term outcomes.
 - Strive for abstinence but have a low threshold for treatment access (i.e., ‘reduced gambling’ or ‘harm reduction’ as an initial step)
 - Treating comorbid mental health problems and gambling fallacies essential



Policy Recommendations

9. Implement policies recommended by other research:

- Restrict access to ATMs in gambling venues.
- Mandatory player pre-commitment on player reward cards.
- Automated alerts to players when gambling behavior escalates.
- Reward *responsible gambling* rather than just gambling consumption on player reward cards.
- Restrict alcohol on the gaming floor.
- Limit the availability of gambling:
 - Continued age 21 restrictions for casinos
 - Continued prohibition of EGMs outside of dedicated gambling venues
 - Limitations on online gambling



MAGIC

Panel Discussion