MAGIC

MASSACHUSETTS GAMBLING IMPACT COHORT STUDY

UNIVERSITY OF MASSACHUSETTS SCHOOL OF PUBLIC HEALTH AND HEALTH SCIENCES

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ANALYSES ACROSS THREE WAVES

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Overview of Presentation

- Defining key terms

- Background

- Study goals & current status

- Key findings

- Implications

- Future directions

Type of Study

SEIGMA:	MAGIC:
REPEAT CROSS-SECTIONAL STUDY	**LONGITUDINAL COHORT STUDY**

- Collecting data *"snapshots"* at designated points over a period of time
- *Not* the same people in each snapshot
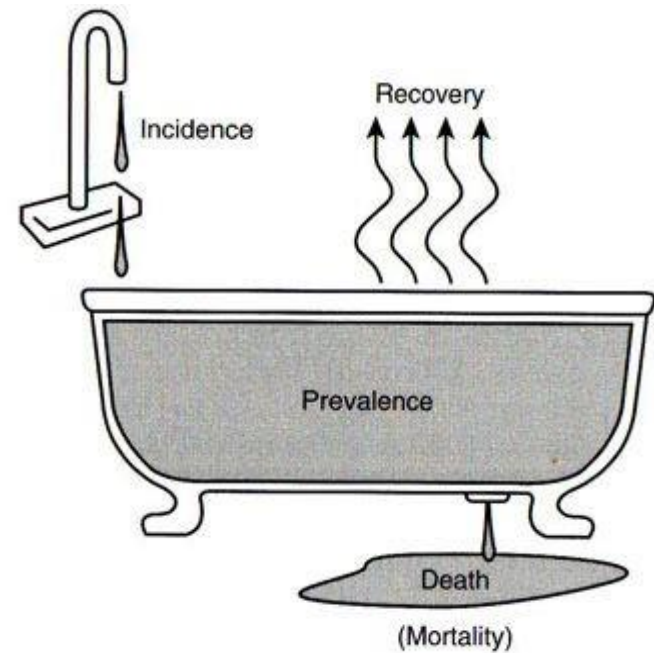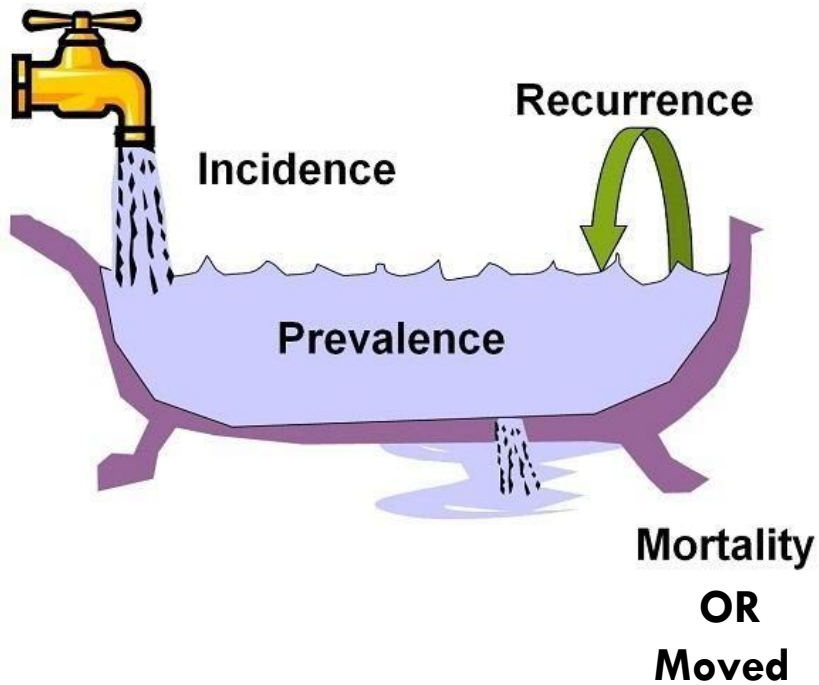
- Collecting a *"moving picture"* of data from a group of people at designated time points
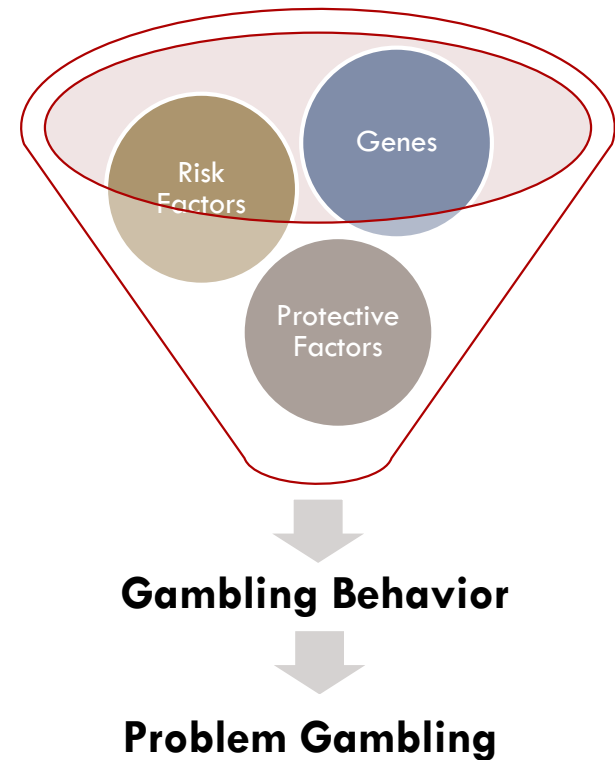- Following *the same people* over a period of time

Epidemiological bathtubs

Etiology

- The study of causation, or what causes a particular condition
- The study of how a condition, in this case problem gambling, develops and fluctuates over time

Risk Factors

Genes

Protective Factors

Gambling Behavior

Problem Gambling

Background

- Early small-scale cohort studies of gambling & problem gambling all had serious limitations

- These limitations led to launch of 5 large-scale cohort studies in 4 countries

Comparing Large-scale Cohort Studies

	Alberta, Canada LLLP	Ontario, Canada QLS	Sweden Swelogs	Australia VGS	New Zealand NGS
Data collection period	2006-2011	2006-2011	2008-2014	2008-2012	2012-2015
Recruited sample	1,808	4,123	8,165	15,000	6,251
Assessment length	2-3 hour	1-2 hour	15-25 min	15-25 min	45 min
Interval (months)	17-22[1]	12	12[2]	12	12
PG Measure	CPGI 5+	PPGM	CPGI 5+	CPGI 8+	CPGI 8+
Baseline PG prevalence	3.6%	3.1%	1.0%	2.6%	2.5%
Wave 2 PG prevalence	2.0%	2.9%	1.1%	1.5%	2.0%
Incidence (Wave 1 – Wave 2)	N/A	1.4%	0.8%	0.12%	0.28%
Proportion of Wave 2 PGs that are new cases	N/A	49.0%	73.5%	33.3%	51.6%

[1] This is the median elapsed time between waves for all respondents.
[2] Between Wave 1 and Wave 2; the interval between subsequent waves was 24 months.

Why MAGIC?

- There have been no major cohort studies of gambling in the US

- Change in gambling availability in MA during this study will be greater than for other cohort studies conducted internationally

- Addresses limitations & builds on findings of previous studies

- Synergistic with SEIGMA, producing results richer than either study alone

Goals

- Examine incidence of problem gambling in Massachusetts
  - Proportion of a population that newly develops a condition over a specified period of time
  - New cases vs. relapsing cases require different mix of services

- Examine stability and transitions associated with problem gambling
  - Patterns of continuity and discontinuity among different risk groups

- Develop an etiological model of problem gambling
  - Etiology – cause or causes of a disease or condition
  - Identifies risk & protective factors
  - Utility in guiding development of prevention, intervention, treatment, recovery support strategies

Current Status

- Wave 1 = Baseline General Population Survey (BGPS) (n=9,578)
  - Stratified sample drawn based on risk profile (n=4,860)

- Wave 2
  - Data collection launched March 2015, completed Sept 2015
  - Cohort established (n=3,139)

- Wave 3
  - Expanded questionnaire to capture etiological factors more comprehensively
  - Data collection launched April 2016, completed August 2016 (n=2,450)

- Wave 4
  - Expanded questionnaire includes additional etiological factors
  - Data collection launched March 2018, completed July 2018 (n=2,443)

- Wave 5
  - Few changes to questionnaire
  - Data collection launched March 2019, completed July 2019 (n~2,300)

- Wave 6
  - Few changes to questionnaire
  - Data collection to launch March 2020

Weighting

- Weighted data used in calculating incidence to allow for more confident generalizing to MA adult population

- Weighting not used in assessing changes in gambling behavior, stability and transitions, or etiology

  - Weighting accounts for stratified sample design and differential response rates by risk group

  - Weights include adjustments for gender, age, race/ethnicity, education

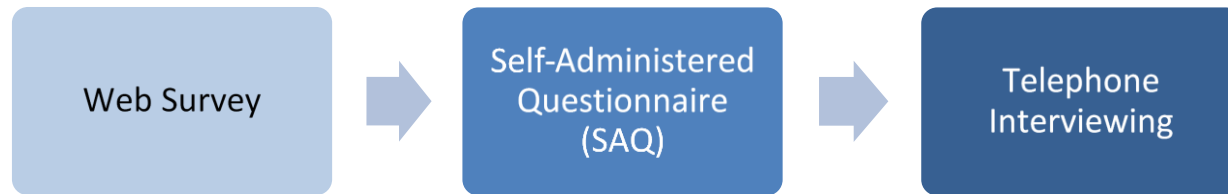 - Additional weighting to adjust for likely participation bias

Establishing the Cohort

Group	Sample Drawn from BGPS	Achieved Cohort	Response Rate by Group %
Problem Gambler	133	81	61.4
At-Risk Gambler	450	295	65.7
Spends $1,200+ annually	1,088	726	67.2
Gambles weekly	792	534	67.6
Military service Sept 2001 or later	49	37	78.7
All other BGPS participants	2,348	1,466	63.1
Total	4,860	3,139	65.1

Data Collection Modes

Multi-Mode Data Collection Approach for Wave 1 and Wave 2

Web Survey → Self-Administered Questionnaire (SAQ) → Telephone Interviewing

Multi-Mode Data Collection Approach for Wave 3

Web Survey → Self-Administered Questionnaire (SAQ) → Telephone Prompting
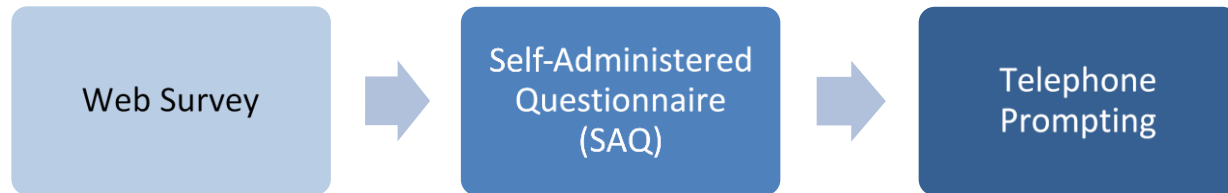
Matching Participants Across Waves

Sample Size Across Waves

Wave 1 n=3,096 → Wave 2 n=3,139 → Wave 3 n=2,450
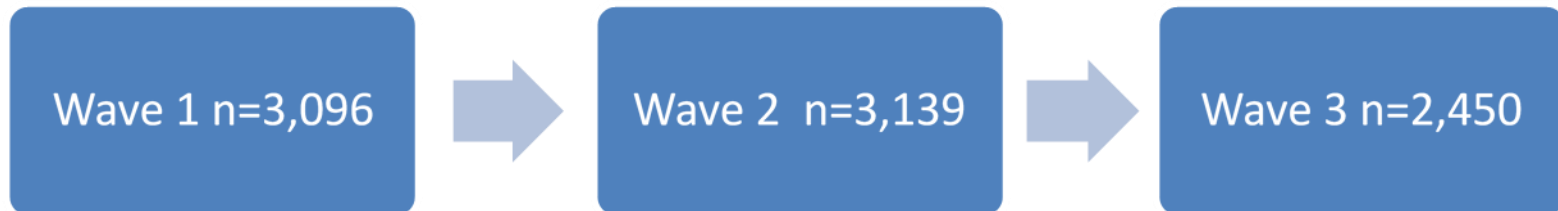
Completion Across Waves

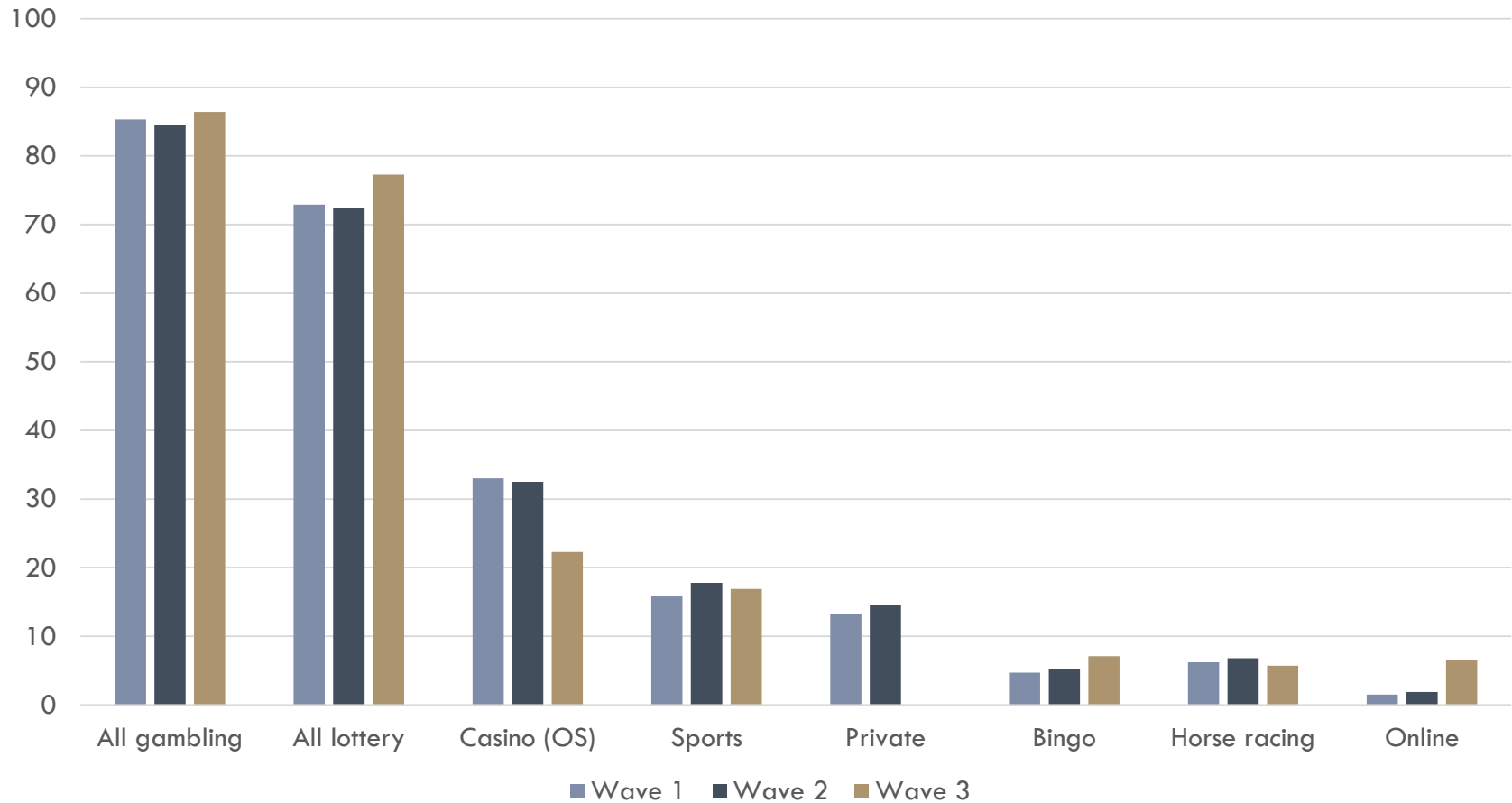| Wave 1 (2013-2014)	Wave 2 (March-Sept 2015)	Wave 3 (April-August 2016)	Frequency	Percent
1=no	2=yes	1=no	21	0.67
1=no	2=yes	2=yes	22	0.70
2=yes	2=yes	1=no	668	21.3
2=yes	2=yes	2=yes	2428	77.3

Where the cohort comes from
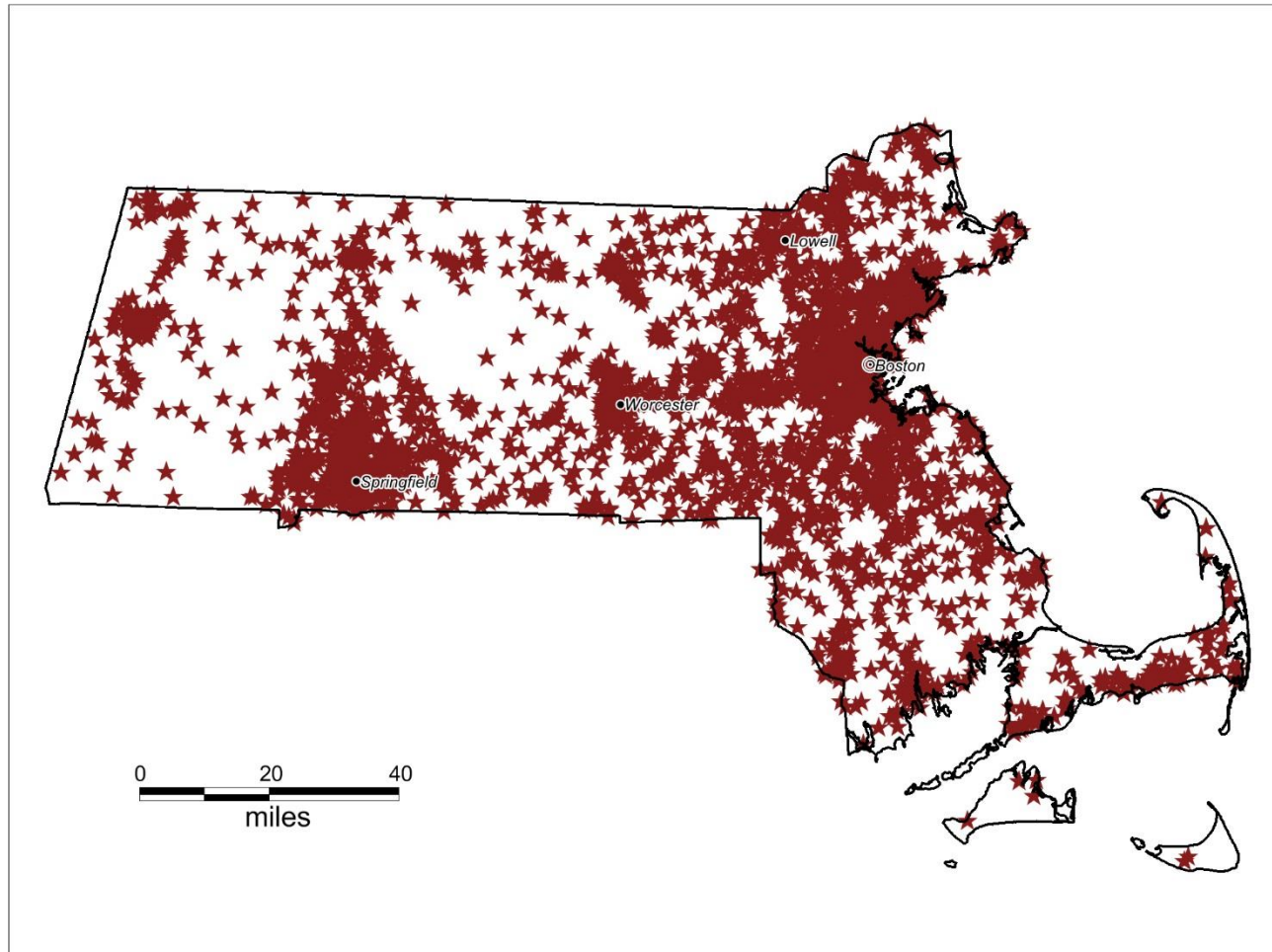
Changes in Gambling Participation

Change in PG Status

Problem Gambling Status in Wave 1 and Wave 2

Wave 1	Wave 2	Frequency
Not a problem gambler	Not a problem gambler	2,943
Not a problem gambler	Problem gambler	60
		3,003
Problem gambler	Not a problem gambler	40
Problem gambler	Problem gambler	39
		3,082
Missing	Not a problem gambler	45
Missing	Problem gambler	---
Not a problem gambler	Missing	8
		3,139

Dash (---) indicates value suppressed due to small cell size

Problem Gambling Status in Wave 2 and Wave 3

Wave 2	Wave 3	Frequency
Not a problem gambler	Not a problem gambler	2,330
Not a problem gambler	Problem gambler	35
		2,365
Problem gambler	Not a problem gambler	38
Problem gambler	Problem gambler	40
		2,443
Missing	Not a problem gambler	---
Not a problem gambler	Missing	---
		2,450
Missing	Did not complete Wave 3	5
Not a problem gambler	Did not complete Wave 3	659
Problem gambler	Did not complete Wave 3	25
		3,139

Dash (---) indicates value suppressed due to small cell size

PG Incidence and Remission

Incidence and Remission Rates, Wave 1 to Wave 2

Problem Gambler	Wave 1 to Wave 2	
	UN[1]	N[2]
No → No	2,943	5,032,690
No → Yes	60	123,631
Incidence rate	2.0%	2.4%
Yes → No	40	57,385
Yes → Yes	39	58,764
Remission rate	50.6%	49.4%

[1] Unweighted N refers to the total number of respondents who completed the PPGM
[2] Weighted N is the total number of respondents who completed the PPGM weighted to the MA population

Incidence and Remission Rates, Wave 2 to Wave 3

Problem Gambler	Wave 2 to Wave 3	
	UN[1]	N[2]
No → No	2,330	5,054,316
No → Yes	35	58,899
Incidence rate	1.5%	1.2%
Yes → No	38	82,090
Yes → Yes	40	104,496
Remission rate	48.7%	44.0%

[1] Unweighted N refers to the total number of respondents who completed the PPGM
[2] Weighted N is the total number of respondents who completed the PPGM weighted to the MA population

Stability & Change Across 3 Waves

- Recreational Gamblers
  - 70.2% remained in this category across 3 waves
- Non-Gamblers
  - 48.1% remained in this category across 3 waves
- Problem/Pathological Gamblers
  - 32.8% remained in this category across 3 waves
- At-Risk Gamblers
  - 20.4% remained in this category across 3 waves

Stability & Change Across 3 Waves

- Others moved in and out of risk categories across waves
  - Some individuals experienced **<u>decrease</u>** in risk category
    - Problem → At-Risk
    - At-Risk → Recreational
    - Recreational → Non-Gambler
  - Some individuals experienced **<u>increase</u>** in risk category
    - Non-Gambler → Recreational
    - Recreational → At-Risk
    - At-Risk → Problem
    - Recreational → Problem
  - Some individuals were **<u>'in transition'</u>** moving to lower or higher category at Wave 2 and then back at Wave 3

Transitions Between PPGM Groups Across Three Waves (unweighted)

Wave 1	Wave 2	Wave 3	Frequency	Percent	% change in risk classification from Wave 1
at risk gambler	non gambler	non gambler	---	---	54.4
at risk gambler	non gambler	recreational gambler	---	---	
at risk gambler	recreational gambler	non gambler	---	---	
at risk gambler	recreational gambler	recreational gambler	112	4.63	
at risk gambler	at risk gambler	non gambler	---	---	
at risk gambler	at risk gambler	recreational gambler	42	1.74	
at risk gambler	at risk gambler	at risk gambler	63	2.61	20.4
at risk gambler	recreational gambler	at risk gambler	37	1.53	18.1
at risk gambler	recreational gambler	problem or pathological gambler	---	---	
at risk gambler	problem or pathological gambler	non gambler	---	---	
at risk gambler	problem or pathological gambler	recreational gambler	6	0.25	
at risk gambler	problem or pathological gambler	at risk gambler	10	0.41	
at risk gambler	at risk gambler	problem or pathological gambler	9	0.37	7.1
at risk gambler	problem or pathological gambler	problem or pathological gambler	13	0.54	
			309		
problem or pathological gambler	non gambler	recreational gambler	---	---	48.5
problem or pathological gambler	recreational gambler	recreational gambler	7	0.29	
problem or pathological gambler	at risk gambler	recreational gambler	---	---	
problem or pathological gambler	at risk gambler	at risk gambler	10	0.41	
problem or pathological gambler	problem or pathological gambler	recreational gambler	---	---	
problem or pathological gambler	problem or pathological gambler	at risk gambler	8	0.33	
problem or pathological gambler	problem or pathological gambler	problem or pathological gambler	21	0.87	32.8
problem or pathological gambler	recreational gambler	at risk gambler	---	---	18.8
problem or pathological gambler	recreational gambler	problem or pathological gambler	---	---	
problem or pathological gambler	at risk gambler	problem or pathological gambler	6	0.25	
			64		

Dash (---) indicates value suppressed due to small cell size

Risk Classification Legend: White = no change in risk Light blue = decrease in risk

Dark blue = increase in risk

Black = in transition

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Discussion

- Small increases in gambling participation but Wave 2-3 changes appear to be due to changes in how questions were phrased

- Notable that out-of-state casino gambling decreased significantly from Wave 2 to Wave 3
  - Suggests that slot parlor (which opened in June 2015) has been successful at 'recapturing' MA residents who previously gambled at out-of-state casinos

- PG incidence Wave 1-2 (prior to casinos) was high (2.4%) but is subject to methodological limitations
  - Differential response rates may have resulted in over-enrollment of heavier gamblers
  - Longer inter-assessment interval (16.5 months vs. 12 months)
  - Reliability of PG measures based on self-report

- PG incidence Wave 2-3 declined (1.2%) and remission was substantial (44%)
  - Number of individuals becoming PGs and number remitting within cohort were almost equal

Discussion

- Stability and transition rates similar to cohort studies in other jurisdictions

- One difference is larger proportion of MA cohort that transitioned over assessments
  - Victoria = 4.3% transitioned down, 5.6% transitioned up
  - MA = 13.0% transitioned down, 14.2% transitioned up, 13.2% moved at both Wave 2 and 3

- Possible reasons for differences
  - May be due to how PG was measured in each study
  - May be due to longer inter-assessment period from Wave 1-2
  - MA cohort includes much higher proportion of individuals selected from high risk strata of BGPS

Discussion

- Recent addiction research suggests that these disorders are more unstable than historically thought
  - Chronic in the sense that there is a higher lifetime risk for relapse, continuation
  - Those experiencing addictions tend NOT to have unremitting manifestations

- Evolving understanding of gambling addiction led to introduction of "past 12-month" timeframe for Disordered Gambling in DSM-5

- Some people merit clinical attention even if they do not meet the more stringent "unremitting" definition of addiction
  - DSM-5 recognizes mild, moderate, and severe levels of Disordered Gambling

Limitations

- Not all sampling biases can be accounted for with weighting

- Individuals recruited into cohort were aware that the study was about gambling and decision to participate could have been shaped by this knowledge

- Repeated surveys known to influence self-report of behavior with respondents seeking to convey some improvement to researchers

- Observed changes over time are sensitive to the reliability of the measurement instrument

Implications for Prevention & Treatment

☐ Stable prevalence rate over time can be due to:

  ▫ Ongoing unremitting PG in same individuals OR

  ▫ Rate of new cases roughly equal to rate of remission

☐ Two scenarios have different implications

  ▫ If PG is chronic, new cases uncommon = preferable to devote more resources to treatment rather than prevention

  ▫ If incidence & recovery both high = greater emphasis on prevention in addition to treatment, recovery support

Implications for Prevention & Treatment

- Number of new PGs in Wave 2 (n=60) higher than ongoing unremitting cases (n=39)

- Number of new PGs in Wave 3 (n=35) lower than ongoing unremitting cases (n=40)

- Relatively high remission rate continued from Wave 2 to Wave 3

- Suggests that both prevention and treatment resources may be beneficial to further decrease incidence & accelerate remission in Massachusetts

Implications for Prevention & Treatment

- Stability & transitions in MA cohort suggest that PGs and At-Risk Gamblers are unlikely to transition to Non-Gambler status

- When Recreational Gamblers transition, they are also unlikely to transition to Non-Gambler status

- Consistent with research that 'controlled' gambling may not be incompatible with recovery from PG
  - Treatment providers may want to consider offering moderate gambling consumption as a treatment goal to increase likelihood of treatment-seeking & treatment adherence
  - Eventual transition to abstinence may emerge from controlled consumption

Future Directions

- Goal of study is to uncover high-risk populations in MA

- Inform development of effective and efficient prevention and treatment programs in the Commonwealth

- Next report will examine longitudinal predictors of PG across 4 waves
  - Focus on differences in incidence, transitions by gender, race/ethnicity, income, region, severity of disorder
  - Examine involvement w/specific types of gambling
  - Examine predictors of remission inc. accessing treatment

Questions?

For more information, visit:

www.umass.edu/macohort