



**RUTGERS UNIVERSITY**  
**Center for Gambling Studies**

# **The Evolution of Online Gambling Among Emerging Adults: Insights from the New Jersey Prevalence Studies in 2017 and 2023**

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# Who We Are

- Founded in 2007, the CGS is a research, policy, and training center, focused on gambling-related issues and co-morbid behavioral addictions (i.e., video gaming, e-sports).
- Named an International Center of Excellence by the International Center for Responsible Gaming.
- In partnership with the Division of Gaming Enforcement, we evaluate every bet placed for online casino (since 2014) and sports wagering (since 2018): About 22 billion bets and 75 TB of data. We currently work with 29 operators.
- We have also conducted two statewide prevalence studies over the past seven years, the first following the legalization of iGaming and the second, sports wagering.

# What We Do

## Knowledge Translation

### RESEARCH

- Big-data analysis for the DGE to inform policy.
- Epidemiological studies to identify at-risk groups to inform prevention and treatment services.
- Center of Excellence projects focused on problem gambling among youth, emerging adults, and athletes.
- Treatment, screening, and outcome studies.

### POLICY DEVELOPMENT

- **Analyze and interpret big-data trends to suggest harm-reduction strategies.**
- **Create inclusive frameworks to ensure all populations are served.**
- **Devise novel strategies to decrease gambling-related harm.**

### TRAINING/PRACTICE

- Trained 520 community providers and Master's students as gambling counselors in partnership with DMHAS.
- Provide ongoing technical and training assistance to DMHAS agencies.
- Developed SBIRT (brief screening) model for health, mental health and community settings.

# Introduction

- NJ Division of Gaming Enforcement:
  - What is the effect of iGaming and sport wagering on problem gambling?
- Answer with big data analysis & prevalence
- Monitor trends with emerging adults and tie to future prevalence studies.



# BIG DATA

Machine Learning and Risk Indicators

# What We Know: Trends in Big Data

- **4%** of sports bettors place **40%** of the bets and spend **57%** of the money.
  - High-intensity bettors place more than **50%** of **all** in-game bets.
  - **Targets for harm-reduction are relatively easy to identify.**
- More young people are betting on sports, with the proportion of those ages 21 to 24 increasing each year.
  - Online sports wagering has increased among those 21-24 from 14% in 2018 to x in 2021.
  - 15-74% placed in-game bets; highest proportion of primarily in-game bettors (10-18%).
- Only **2-4%** of bettors use RG features, including limit-setting.
  - The youngest bettors, 21 to 24 years, are the **least likely** to use features.

# What We Know: Trends in Big Data

- **98.5%** of bettors use credit cards or ePay services, including the youngest bettors.
  - Makes it easy to mask multiple, overspent credit cards or underfunded accounts.
- Overall, about **85%** of sports bets lose.
  - More than **80%** of sports bets are parlays, and more than **90%** of parlays lose.
- More than **2/3** of bettors bet in game.
  - In-game betting increases the likelihood of overspending, gambling in the “heat” of the moment, and/or under the influence of alcohol.



# Prevalence





# What We Know: NJ 2023 Prevalence Study

- Those who bet on sports were significantly more likely than others to:
  - **use tobacco, alcohol, and/or illicit drugs;**
  - **binge drink;**
  - **report problems with drug and alcohol use;**
  - **engage in all types of addictive behaviors.**
- Sports bettors reported significantly higher rates of **moderate and severe mental health problems, anxiety, and depression**, compared to others who gambled.
  - About **14%** of sports bettors had experienced **thoughts of suicide;**
  - About **10%** of sports bettors said they had actually **made a suicide attempt.**
  - About **13%** of sports bettors reported engaging in **non-suicidal self-injury.**

# What We Know: NJ 2023 Prevalence Study

- Compared to others who gamble, sports bettors:
  - Bet at **high frequency** (once a week or more) (73% vs. 30%).
  - Bet **both online and in land-based locations** (86% vs. 24%).
  - Bet on **more activities** (9 vs. 2).
  - Endorse more symptoms of **high-risk** (35% vs. 3%) or **moderate-risk** (16% vs. 5%) problem gambling.



# Prevalence Surveys: Emerging Adults

- **Epidemiological Surveys**

- Dual sampling frame (CATI from random digit dialing pool cell + landline; online panel survey)

- **Sample Sizes**

- 2023 (2021) = 591 18-27
- 2017 (2016) = 687 18-27



## Demographic characteristics of emerging adults (N=591: 2023)

	% (n)
Age (M[SD])	22.98 (2.71)
Gender	
Male	49.22% (291)
Female	50.78% (300)
Race	
White	52.20% (309)
Black/African American	26.13% (154)
Asian American/Pacific Islander	16.11% (95)
Other	5.56% (33)
Hispanic	38.04% (225)
Marital Status	
Single	82.54% (488)
Married/living together	15.68% (93)
Divorced, separated, widowed	1.79% (10)

## Gambling activity preferences of emerging adults (N=591)

<b>Activity</b>	<b>% (n)</b>
<b>Any gambling</b>	50.99% (301)
<b>Lottery</b>	23.78% (141)
<b>Scratch-off tickets</b>	22.82% (135)
<b>High-risk stocks</b>	20.43% (121)
<b>Games of skill<sup>b</sup></b>	19.38% (115)
<b>Bingo</b>	14.69% (87)
<b>Cryptocurrency trading</b>	14.37% (85)
<b>Gaming machines<sup>a</sup></b>	14.33% (85)
<b>Live casino table games<sup>a</sup></b>	13.98% (83)
<b>Sports wagering<sup>a</sup></b>	13.18% (78)
<b>Season-long fantasy sports</b>	13.03% (77)
<b>Esports wagering<sup>a</sup></b>	10.96% (65)
<b>Daily fantasy sports</b>	10.18% (60)
<b>Live poker<sup>a</sup></b>	10.02% (59)
<b>Horse racing</b>	8.05% (48)
<b>Keno</b>	7.69% (45)

## Past-year gambling participation by activity, comparing 2016 (N=678) vs 2021 (N=591)

Gambling Activity	2016 Sample	2021 Sample
	% (n)	% (n)
Lottery	46.61% (315)	23.78% (141)
Scratch-off tickets	48.24% (324)	22.82% (135)
High-risk stocks	14.45% (96)	20.43% (121)
Games of skill	19.96% (134)	19.38% (115)
Bingo	21.74% (145)	14.69% (87)
Gaming machines (slots, video poker)	20.44% (136)	14.33% (85)
Live casino table games	19.71% (132)	13.98% (83)
Sports wagering	20.67% (138)	13.18% (78)
Daily fantasy sports	16.63% (110)	10.18% (60)
Live poker	12.79% (86)	10.02% (59)
Horse racing	12.84% (86)	8.05% (48)

# Gambling behavior (2023)

- The average emerging adult gambles on an average of more than four activities.
  - The more activities people gamble on, the higher the risk for problem gambling.
- **36%** of emerging adults gamble at **high frequency** (once a week or more) and **31%** at **moderate frequency** (2 to 3 times a month)
  - The more often people gamble, the higher the risk for problem gambling.
- **More than 41% gamble in mixed venues.**
  - People who gamble both online and in land-based venues (mixed) have the highest rates of pg.
- **Three times as many emerging adults (18%) are high risk gamblers**, compared to all adults.
  - 6% of all adults are classified as high risk, which is three times the average U.S. rate.

**Gambling behavior  
and problem  
gambling severity  
among emerging  
adult gamblers  
(N=301)**

	<b>% (n)</b>
<b># of Gambling activities (M [SD])</b>	4.25 (4.26)
<b>Gambling frequency</b>	
Low	33.32% (100)
Moderate	30.79% (93)
High	35.89% (108)
<b>Gambling venue</b>	
Online only	31.81% (96)
Land-based casino only	26.34% (79)
Mixed venues	41.85% (126)
<b>PGSI scores of gamblers (M [SD])</b>	2.98 (5.34)
<b>Problem gambling risk</b>	
No risk	61.34% (185)
Low risk	12.86% (39)
Moderate risk	7.74% (23)
High risk	18.06% (54)



# Under 21 gambling illegally versus legally versus other gamblers

- **Nearly 50%** of emerging adults under 21 who gambled illegally were gambling at **high frequency** and **about 32%** at **moderate frequency**.
  - Those under 21 who were gambling legally (i.e. on lottery/scratch-offs, horses) gambled at the lowest frequency.
- **Emerging adults under 21 gambling illegally were the most likely and those gambling legally the least likely to gamble online or at mixed venues.**
  - About 35% of those gambling illegally gambled online and 54% at mixed venues.
  - They gambled on an average of 6 activities, compared to less than 1 for those under 21 gambling legally and 3 for those gambling legally.
  - About 37% gambled at high risk, compared to 0% of those under 21 gambling legally and 17% of those who gambled legally.



# Gambling behavior and problem gambling severity among emerging adult gamblers classified by legality of participation (N=301)

	Emerging adults under 21 who gambled illegally (n=45) % (n)	Emerging adults under age 21 who gambled legally (n=28) % (n)	Emerging adults 21-27 who gambled (n=228) % (n)	Bivariate comparison
<b>Gambling frequency</b>				$\chi^2(4)=15.63, p=0.02$
Low	18.23% (8)	59.85%(17)	33.05% (75)	
Moderate	32.29% (15) <sup>b</sup>	21.91% (6) <sup>a</sup>	31.58% (72)	
High	49.48% (22) <sup>b</sup>	18.24 (5) <sup>a</sup>	35.37% (81)	
<b>Gambling venue</b>				$\chi^2(4)=30.73, p<0.001$
Online only	35.28% (16) <sup>b</sup>	28.48% (8) <sup>a</sup>	31.55% (72)	
Land-based casino only	10.34% (5)	63.19% (18)	24.86% (57)	
Mixed venues	54.39% (24) <sup>b</sup>	8.33% (2) <sup>a</sup>	43.60% (99) <sup>a</sup>	
<b>No. of gambling activities (M [SD])</b>	6.04 <sup>c</sup> (5.45)	1.41 <sup>a</sup> (0.82)	4.25 <sup>b</sup> (4.03)	
<b>PGSI scores (M [SD])</b>	5.66 <sup>c</sup> (6.59)	0.21 <sup>a</sup> (0.73)	2.78 <sup>b</sup> (5.11)	
<b>Problem gambling risk</b>				$\chi^2(6)=24.94, p<0.001$
No risk	38.38% (17)	89.19% (25)	62.48% (142)	
Low risk	14.60% (7)	6.95% (2)	13.24% (30)	

# Prevalence study comparisons

- The proportion of emerging adults who gambled only online **more than tripled**, from about 8% in 2016 to nearly 30% in 2021, which generally reflected increases in the overall survey population, from 4% to 14%.
- Emerging adults also had **higher rates of gambling in mixed venues** (both online and land-based) in 2021 (40.08%) than in 2016 (32.21%).
- Among those who gambled in both the full sample and subsample of emerging adults, there were **increases across all forms of addictive behaviors as well as suicidal ideation**.
- Particularly notable were increases among emerging adults in **drug use** (22% increase), **overeating/binge eating** (20% increase), **excessive shopping** (18% increase), and **excessive video or Internet gaming** (21% increase).



# Comparisons of full samples and sub-samples of emerging adults in 2016 and 2021

	Full Sample 2016 (N=3,634)	Emerging Adults 2016 (N=678)	Full Sample 2021 (N=3,512)	Emerging Adults 2021 (N=591)
<b>% who gambled</b>	69.81%	66.11%	60.09%	49.21%
<b>Among Gamblers</b>	N=2,536	N=448	N=2,110	N=291
<b># of Gambling activities (M [SD])</b>	3.00 (2.37)	3.79 (2.98)	3.02 (2.65)	3.47 (3.09)
<b>Gambling frequency</b>				
Low	33.01%	33.27%	14.15%	34.73%
Moderate	27.52%	25.47%	29.64%	31.74%
High	39.47%	41.25%	38.20%	33.53%
<b>Gambling venue</b>				
Online only	4.11%	8.10%	14.04%	29.62%
Land-based only	83.03%	59.69%	52.83%	30.30%
Mixed venues	12.86%	32.21%	33.13%	40.08%
<b>PGSI scores (M [SD])</b>	1.76 (4.12)	3.84 (5.86)	1.88 (4.67)	3.03 (5.38)
<b>Problem gambling risk</b>				
No risk	69.42%	47.79%	69.74%	60.70%
Low risk	12.74%	16.39%	13.86%	13.23%
Moderate risk	8.82%	14.56%	7.22%	7.72%
High risk	9.02%	21.25%	9.19%	18.34%

## Comparisons of full samples and sub-samples of emerging adults in 2016 and 2021

Addictive behaviors and mental health issues	Full Sample 2016 (N=3,634)	Emerging Adults 2016 (N=678)	Full Sample 2021 (N=3,512)	Emerging Adults 2021 (N=591)
Alcohol use	76.44%	72.29%	81.15%	79.65%
Tobacco use	30.20%	34.14%	29.64%	43.63%
Drug use	11.75%	24.82%	30.25%	46.64%
Overeating/binge eating	6.68%	8.67%	17.43%	28.83%
Excessive exercise	3.08%	5.77%	7.06%	9.89%
Excessive shopping	3.14%	5.49%	14.91%	23.31%
Excessive video or Internet gaming	5.01%	9.85%	18.19%	30.55%
Suicidal ideation	3.40%	8.08%	5.22%	8.89%
Suicide attempt	1.65%	5.06%	2.55%	4.63%

# Participation in gambling-like activities

- In 2021, a notable proportion of emerging adults also reported participated in activities with gambling components:
- Social casino gaming (31.80%) and purchasing loot boxes in video games (23.05%) emerged as the most popular.

Activity	% (n)
<b>Social casino gaming</b>	31.80% (188)
<b>Purchasing loot box</b>	23.05% (136)
<b>Skin gambling</b>	15.94% (94)
<b>Trading cryptocurrency</b>	14.37% (85)
<b>Esports betting</b>	10.96% (65)

About 11% of the sample bet on esports, though this was not a legally sanctioned activity in New Jersey until 2022.

# Comorbid associations

- **Gambling frequency, problem severity scores for gambling, alcohol, and drugs; and the number of addictive behaviors endorsed** were all significantly associated with each of these gambling and gambling-like activities.
- The largest associations were between **gambling frequency** and **high-risk stock trading**  $r(589) = .60, p < .001$ , **esports betting**  $r(589) = .52, p < .001$ , and **cryptocurrency trading**  $r(589) = .51, p < .001$ , as well as between **esports betting** and **PGSI score**  $r(589) = .58, p < .001$ .
- Additionally, **cryptocurrency trading, esports betting, skin betting, and social casino gaming** were associated with **depression** and **anxiety scores**.
- **esports betting, skin betting, and social casino gaming** with **higher perceived stress scores**.

## Bivariate correlations between gambling/gambling-like activities and gambling frequency and problem severity and co-morbid problems among emerging adults (N=591)

	Crypto trading	High-risk stock trading	Esports betting	Skin betting	Loot box purchasing	Social casino gaming
<b>Gambling frequency</b>	0.51*	0.60*	0.52*	0.33*	0.22*	0.38*
<b>PGSI score (only gamblers)</b>	0.42*	0.27*	0.58*	0.45*	0.29*	0.48*
<b>AUDIT score</b>	0.16*	0.21*	0.19*	0.10*	0.12*	0.14*
<b>DAST score</b>	0.35*	0.27*	0.35*	0.27*	0.09*	0.30*
<b>No. of addictive behaviors</b>	0.27*	0.17*	0.30*	0.31*	0.25*	0.30*
<b>Depression score</b>	0.13*	0.06	0.14*	0.18*	0.06	0.18*
<b>Anxiety score</b>	0.09*	0.01	0.09*	0.15*	0.05	0.18*
<b>Perceived stress</b>	0.07	0.06	0.12*	0.13*	0.06	0.14*



# Activities associated with suicidality and self-harm

- Among emerging adults, **cryptocurrency trading, esports betting, skin betting,** and **social casino gaming** also were significantly associated with **morbid thinking, self-harm behaviors, suicidal ideation, and suicide attempts.**
- **High-risk stock trading** was associated with **suicidal ideation** and **attempts.**
- Loot box purchasing was not associated with any of these.



**Chi square tests between gambling/gambling-like activities and suicidality among emerging adults (N=591)**

	Crypto trading	High-risk stock-trading	eSports betting	Skin betting	Loot box purchasing	Social casino gaming
<b>Morbid thinking</b>	24.15%*	19.69%	30.37%*	32.03%*	21.71%*	27.43%*
<b>Non-suicidal self-injury</b>	16.51%*	12.96%	23.53%*	23.74%*	11.58%*	23.62%*
<b>Suicidal ideation</b>	12.04%*	6.92%*	16.08%*	14.66%*	5.92%*	13.21%*
<b>Suicide attempts</b>	18.18%*	12.15%8	20.81%*	17.67%*	11.77%*	23.57%*

## Other analyses

- Compared to those ages 28 and over, the following risk factors were associated with significantly higher levels of problem gambling severity for emerging adults:
  - being male
  - gambling in mixed venues
  - reporting family member substance misuse
  - moderate or high frequency of gambling participation with family members during childhood or adolescence.
- Higher AUDIT (alcohol) scores and gambling online only or in mixed venues were not significantly related to higher gambling frequency among emerging adults.



# Conclusions

- Overall, a significant proportion of emerging adults, including those underage, are gambling online and in mixed venues, which raises the risk for developing serious gambling problems.
- About **three times** as many emerging adults, compared to all others who gambled, endorsed multiple problem gambling symptoms, which correspond to clinical criteria of gambling disorder.
- The influence of **family and household members** who engage in addictive behaviors is predictive of future gambling problems and suggests that prevention efforts should focus on family systems, particularly targeting parents and siblings who gamble.



# Conclusions

- Finally, the presence of distinct subgroups of emerging adults who gamble underscores the differential roles of emotional dysregulation, comorbidity, and familial modeling in the development of problem gambling.
- Education, prevention, and policy initiatives targeting these risk factors are critical to decrease the harm that could result from initiation and problem symptoms at an early age as this group moves into middle adulthood, when gambling participation is typically at its highest levels.



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