



# 2023 Global Health and Welfare Forum in Taiwan

## Substance Use and Problems among Young People in Taiwan: Evolution and Predictors in the Context

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# **Chuan-Yu Chen (陳娟瑜), PhD**

## **Present professional positions**

- **Professor, Institute of Public Health, National Yang Ming Chiao Tung University, Taipei, Taiwan**
- **Joint Investigator, Center for Neuropsychiatric Research, NHRI (2004, 2010)**
- **Adjunct Professor, College of Public Health, National Taiwan University, Taiwan.**
- **Adjunct Professor, the Department of Epidemiology and Biostatistics, College of Human Medicine, Michigan State University, USA**

## **Research interests**

- **Substance use and problems (especially in vulnerable populations), underage drinking**
- **College on Problems of Drug Dependence (CPDD), regular member**
- **International Society of Substance Use Professionals (ISSUP), Advanced Member**
- **American Psychological Association, International member**

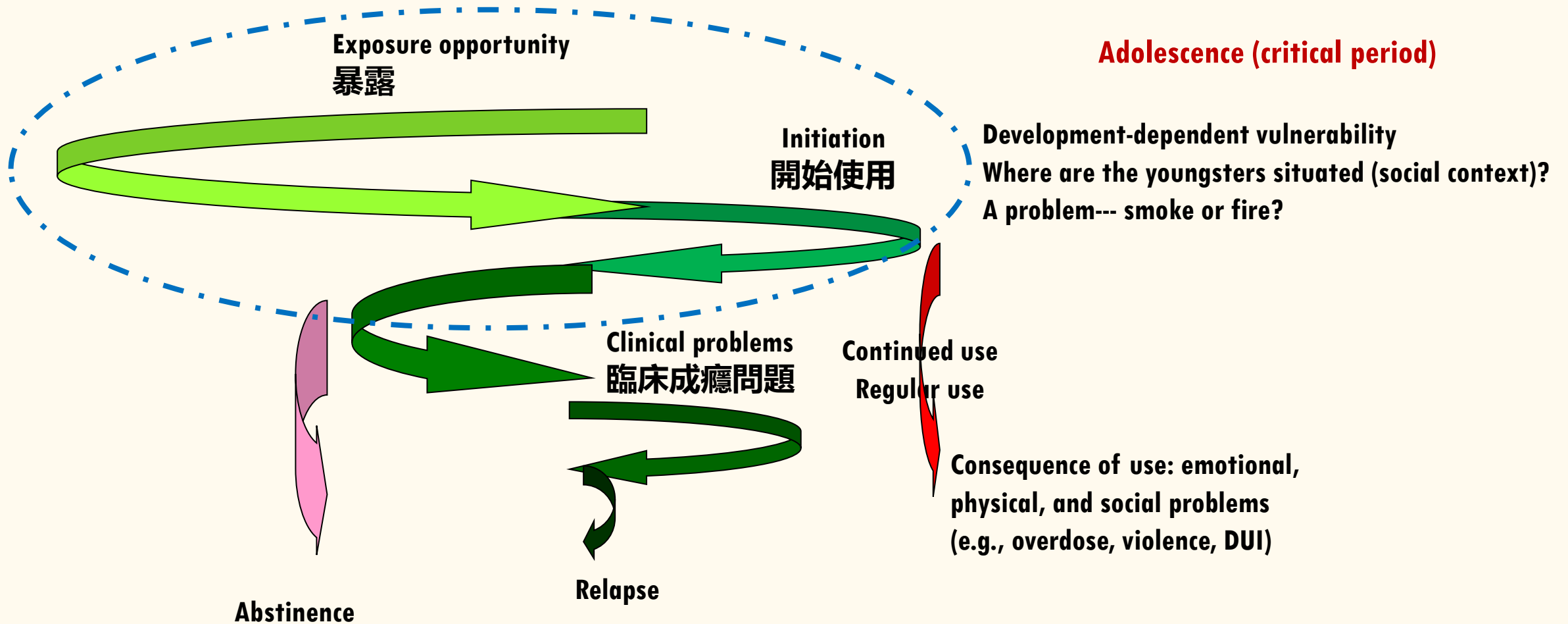
## **Conflict of interests: none**

- **Grants from the NHRI, MOST/NSC, MHW, Fulbright**



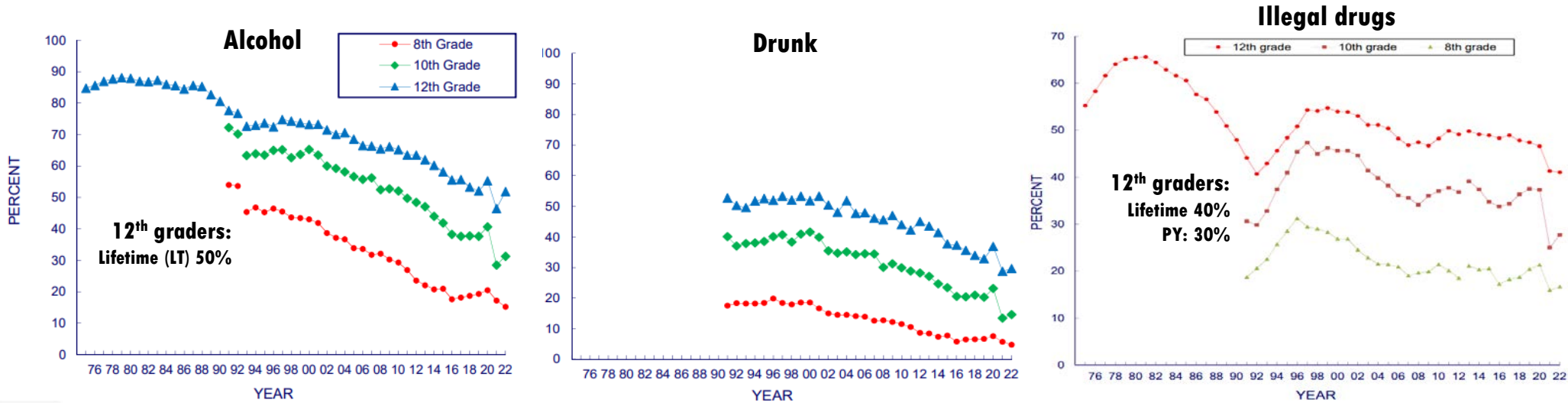
- **Substance use in young people**
  - **Basic 101**
  - **Evidence from Taiwan**
  - **Implication for intervention and policy**

# Natural history of substance use and problems: Multistage and stage-dependent factors

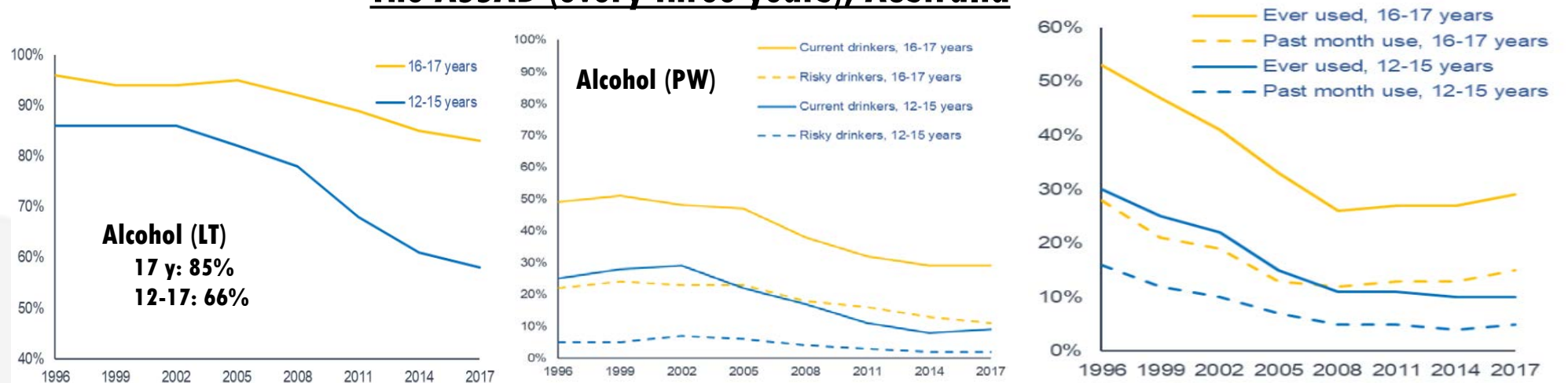


# Epi 101 in the US and Australia

## The MTF, US

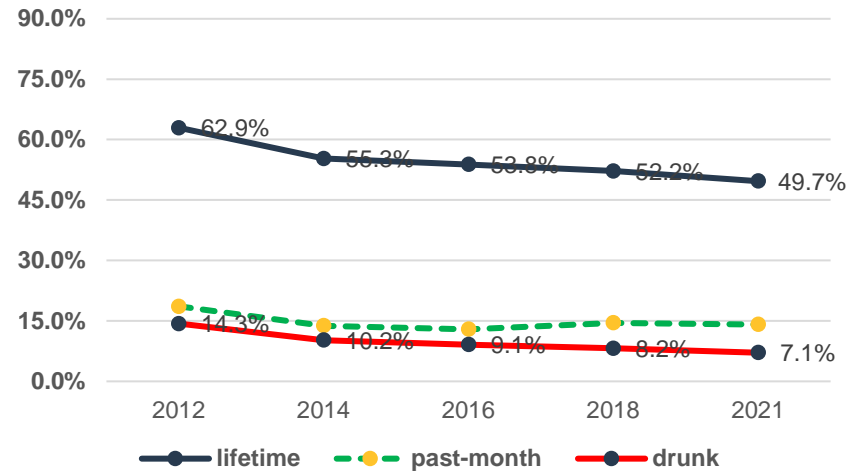


## The ASSAD (every three years), Australia



# Alcohol use among young people in Taiwan

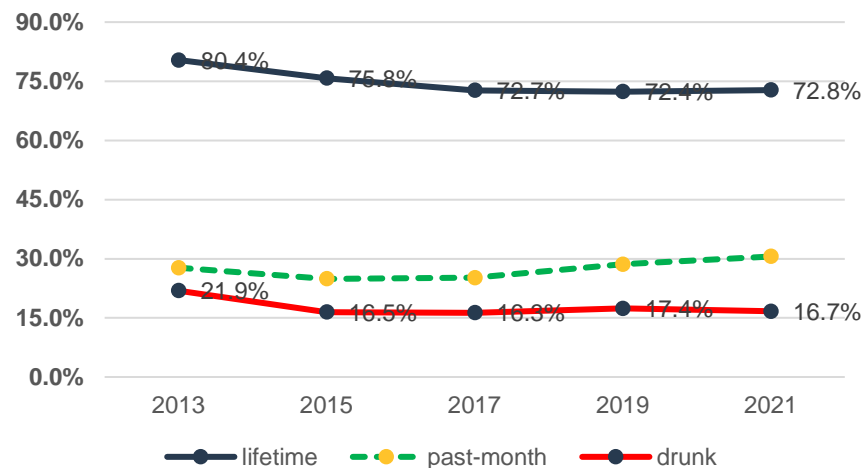
## Junior high school



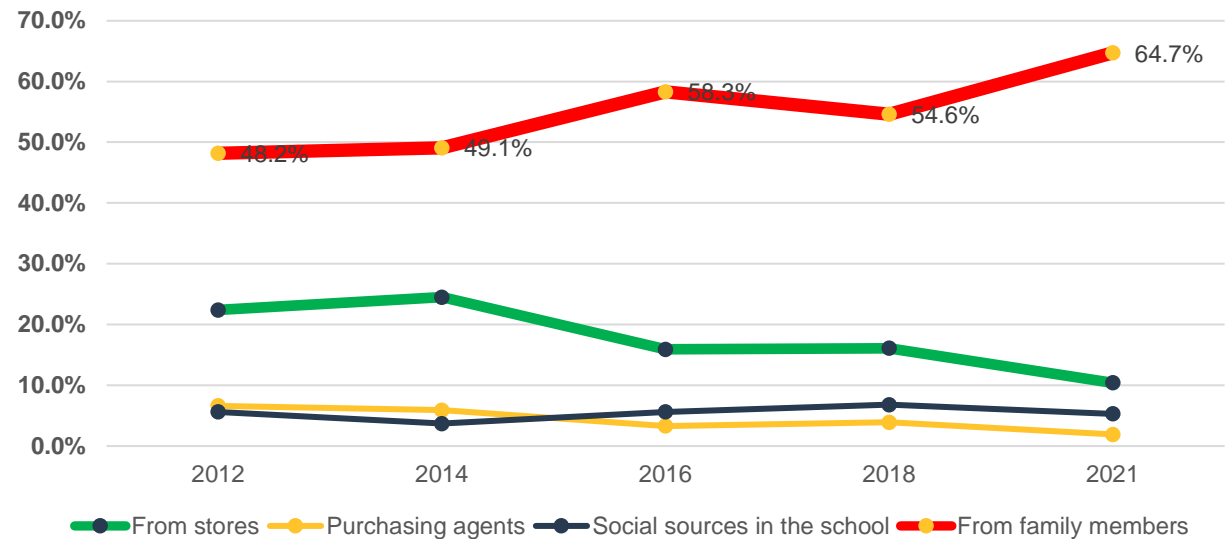
- Alcohol initiation (LT): 50%<sub>j</sub> and 73%
- Being drunk (LT): 7%<sub>j</sub> and 17%
- Past month: 15%<sub>j</sub> and 30%

- Two-thirds accessed alcohol from parents/family members

## Senior/vocational high school

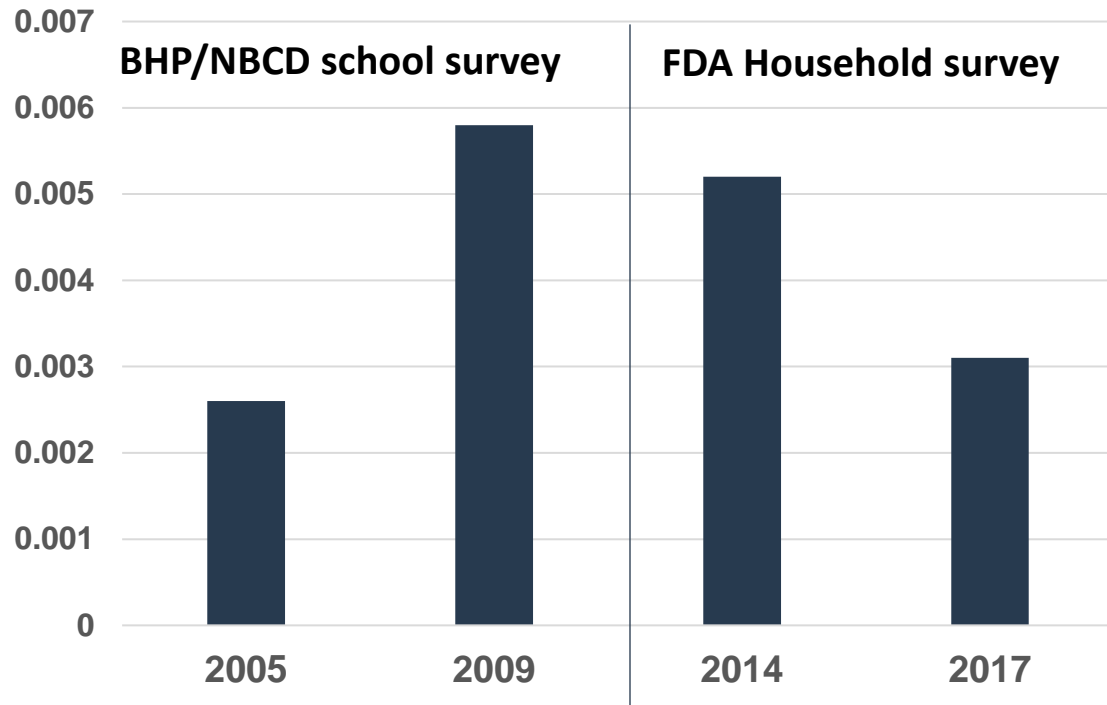


## Sources of alcoholic beverages among the alcohol-experienced junior high students (past month)

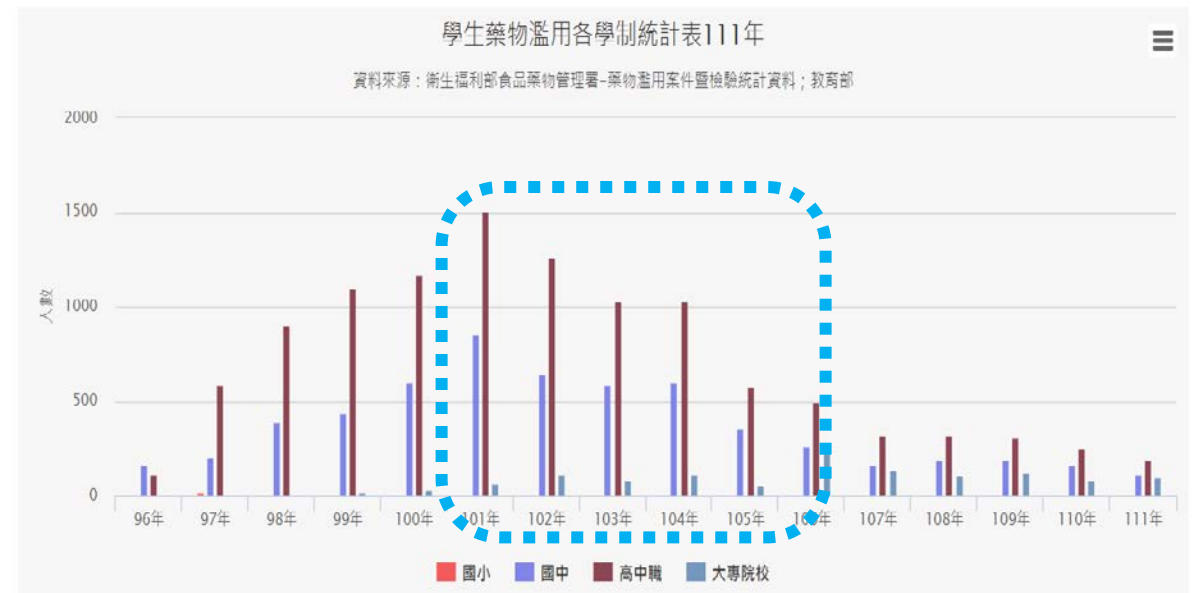


# Use of illegal drugs among young people in Taiwan

12-17 Lifetime prevalence <1%



統計圖表-學生藥物濫用各學制統計表111年



HS/VS: 800,000

Source: <http://nhis.nhri.org.tw/>; <https://www.fda.gov.tw/upload/133/2018051410282233867.pdf>;  
<https://antidrug.moj.gov.tw/sp-cmcp-7-18-2.html>

# Underage substance use in the context of Taiwan: risk and protective factors

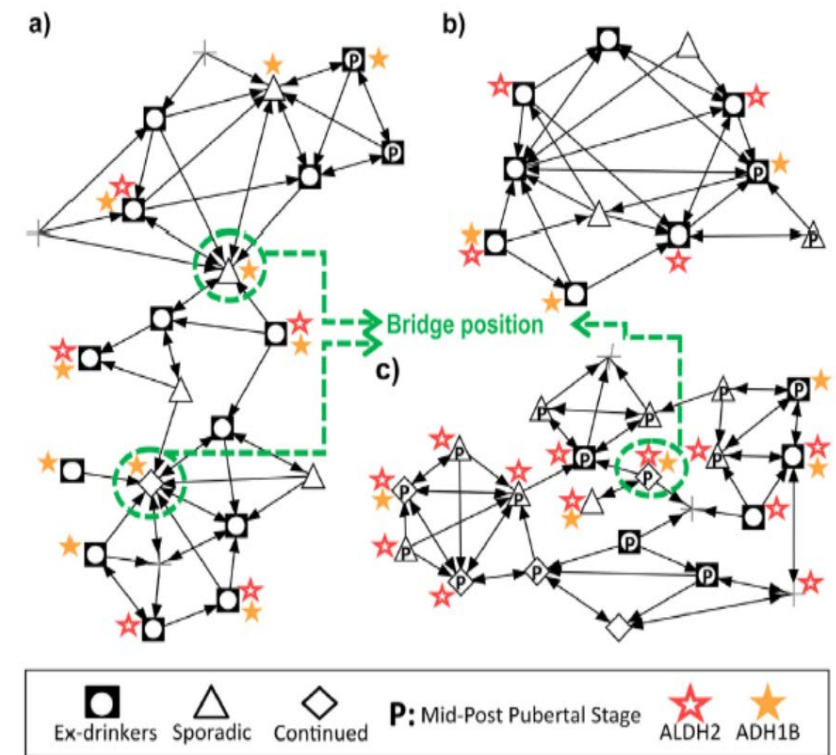
Risk factors	Domain	Protective factors
Early puberty onset	Individual	Gene
Parental drinking Alcohol offer	Family	Parenting practices (e.g., parental monitoring)
Network position	Peers	Norms against alcohol
Poverty	School	Social capital
Convenience stores	Community	Collective efficacy
Alcohol advertising	Media	



# Gene, puberty development, and social network for underage drinking

## Alcohol-Related Experience among Children (AREC)

1. Peer network and norms
  - Alcohol naive: having **peers against alcohol drinking** may reduce drinking occasions in 9th grade (aIRR = 0.59; 95% CI = 0.41–0.87); peer nomination ↑
  - Alcohol experienced: parental alcohol offer, peer drinking
2. Alcohol-metabolizing genes appear to **have protective effects in the youngsters in pre-to-early pubertal stage**;
  - The adjusted odds ratio (aOR) of **ALDH2 slow-genotype** for both sporadic and continued drinkers was 0.47 and 0.42, respectively.
  - Children having **the bridge position** in their peer network were more likely to be sporadic drinkers (aOR = 4.15) and continued drinkers (aOR = 3.16).



# Commercial determinants for underage drinking in Taiwan

Variables	Null model	Model with compositional and contextual variables
<i>Measures of association (OR, 95% CI)</i>		
<i>Compositional variables</i>		
Male gender		0.90 (0.85–0.94)*
High/vocational school (versus middle school)		1.50 (1.39–1.61)*
Senior grade (versus junior grade)		1.44 (1.35–1.52)*
Truancy		2.05 (1.95–2.17)*
Tobacco smoking		4.14 (3.92–4.37)*
Single-parent family		1.07 (1.00–1.14)*
Current employment		1.22 (1.12–1.33)*
Higher allowance		1.49 (1.42–1.57)*
Web-based SAQ (versus paper-and-pencil)		0.74 (0.68–0.80)*
<i>Contextual variable</i>		
<i>Availability of convenience stores</i>		
Medium (versus low)		1.04 (0.96–1.13)
High (versus low)		1.08 (1.00–1.17)*
Trend test		<i>P</i> = 0.04
<i>Measures of variation or clustering</i>		
Geographical region level variance (SD)	0.022 (0.014)	0.004 (0.003)
School level variance (SD)	0.131 (0.022)	0.012 (0.009)
PCV		90.8%
MOR (95% CrI <sup>2</sup> )	1.41 (1.34–1.49)	1.11 (1.00–1.19)
Class level variance (SD)	0.231 (0.019)	0.130 (0.014)

## National Survey of Illegal Drug Use among Adolescents

- A total of 52 214 students aged 11–19 years from 387 middle or high schools were selected with national representativeness
- Geographical information systems to retrieve the number of convenience stores within 1 km, a 12–15-minute walk.
- Convenience stores- a proxy for alcohol availability in the community.

## Alcohol-Related Experience among Children (AREC)

- One in nine 10–12-year-old children ever purchased alcoholic beverages
  - 70% Convenience stores
  - School districts play a role in shaping alcohol purchase
- **Vs. tobacco (funding/NGOs)**

# Alcohol advertising and television on underage drinking

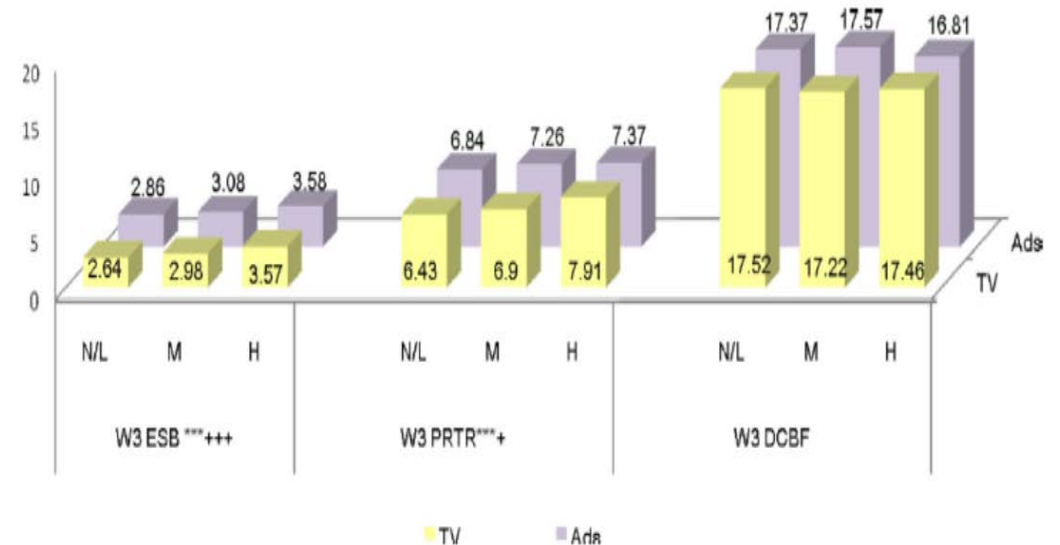
## Alcohol-Related Experience among Children (AREC)

### 1. Alcohol advertising (AD)

- Alcohol naive: Exposure to television alcohol advertising may increase the incidence of alcohol drinking by 139%;

### 2. Alcohol expectancies:

- Cognitive template toward alcohol drinking; positive and negative
- 2 + hours of **watching TV** per day was associated with increased levels of positive AEs “Promoting Relaxation or Tension Reduction [PRTR” ( 1.52;  $p < 0.001$ )
- The exposure to **alcohol advertising** was associated with a decline in negative AEs “Deteriorated Cognitive and Behavioral Function” (e.g.,  $>8.0$  ads: =  $-1.06$ , 95% CI =  $-1.66, -0.47$ ,  $p < 0.01$ ).



Ads: The Nielsen Media Research Advertising Information Services

# Family capital and adversity on underage drinking

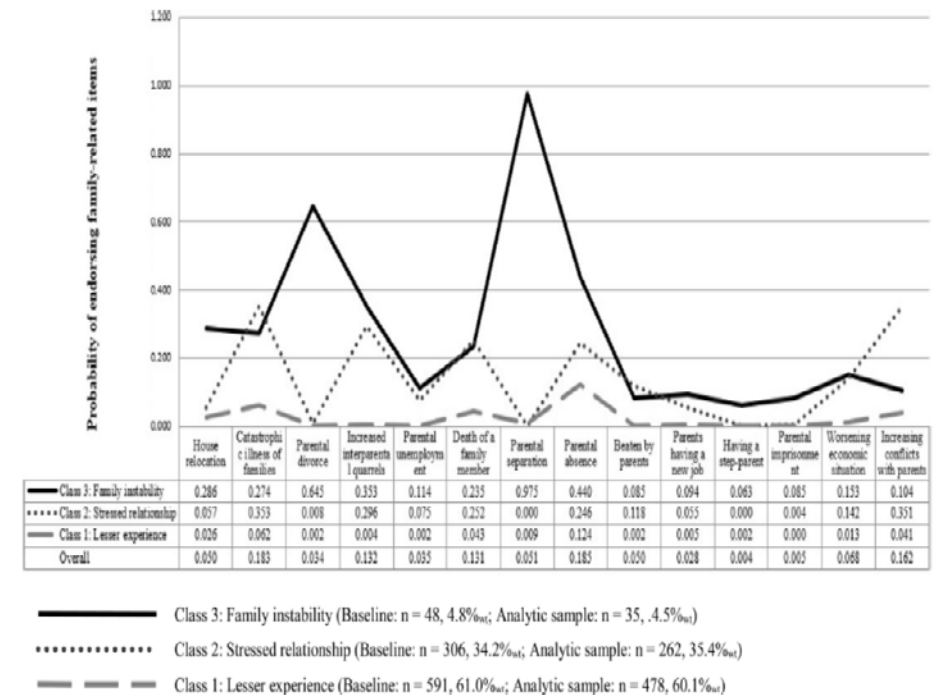
## Alcohol-Related Experience among Children (AREC)

### 1. Parenting practice

- 1/10 reported having drunk alcohol on 4+ occasions; 14% had binge drinking
- Parental involvement/reinforcement appeared prominently protective in reducing occasional drinking only in adolescence (aOR=0.54);

### 2. Alcohol expectancies:

- Children experiencing four or more negative life events (NLE)(1.27, 95 % CI = 0.27–2.27) and in the “stressed relationship” NLE class appeared to develop greater AEs (0.86, 95 % CI = 0.30–1.42).
- The NLE-associated increase was especially salient in the AE domains regarding “**global positive transformation**” and “**promoting relaxation or tension reduction**”
- Childhood ACE exposure increased the growth of ESB



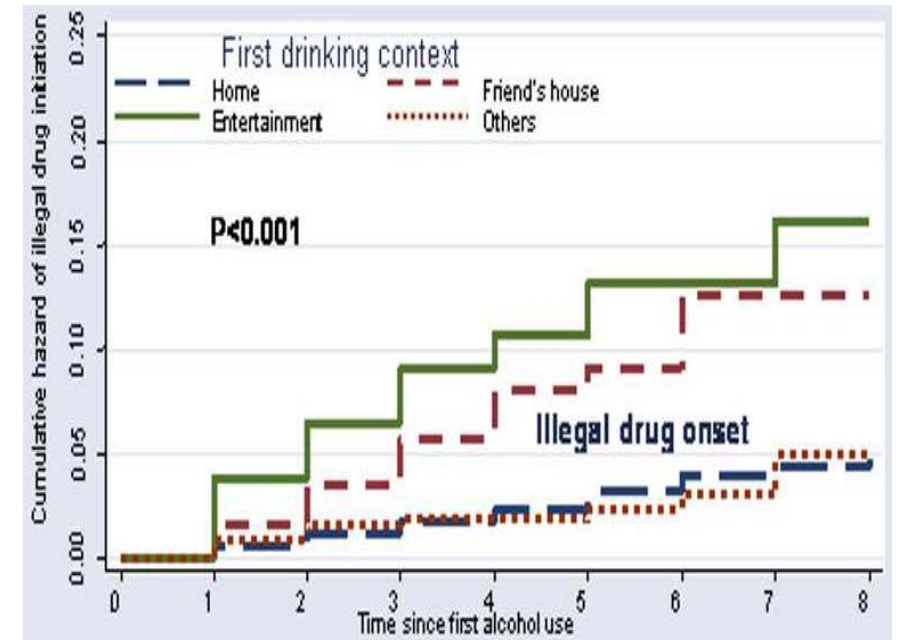
# Alcohol-related consequences: harms and illegal drugs

## 1. Alcohol harms from others' drinking (AHOD) in adolescents

- Lifetime prevalence of physical and psychological AHOD: 0.92%
- Monthly drinking may elevate the risk of AHOD by 477%;
- Parental drinking was associated with increased AHOD (aOR=11.3, 14.9)

## 2. Among the alcohol-experienced students

- Lifetime prevalence of illegal drugs for those initiated drinking in entertainment, friends' homes, and home was 12.4%, 7.1%, and 2.4% (alcohol naïve: 0.5%)
- **Having the first drink in an entertainment setting was associated with a faster progression into the initiation of illegal drugs (hazard ratio [HR] = 2.5)**



# 2013-2016 school attending adolescents who used drugs (MOE)

## 2015 12-17

n=1681908

- ◆ N=1530
- ◆ 0.09%

- ◆ Poverty/LI: 7.9%
- ◆ 1+ drug-using family 2.3%

- ◆ HRF: 0.74%
- ◆ ADHD treatment: 3.53%
- ◆ Dropout consultation: 0.25%

## Middle school (N=1605)

### Illegal drugs

- ◆ 83% ketamine, 17% amphetamine
- ◆ Scheduled III/IV: 81%
- ◆ Referred status: 24%

### Family characteristics

- ◆ Poverty/low income: 25.6%
- ◆ Households with drug-using adults: 16%

### Services received

- ◆ HRF: 11.4%
- ◆ ADHD treatment: 6.4%
- ◆ Dropout consultation: 35%

## High school (N=2225)

### Illegal drugs

- ◆ 87% ketamine, 11% amphetamine
- ◆ Scheduled III/IV: 86%
- ◆ Referred status: 24%

### Family characteristics

- ◆ Poverty/low income: 17.5%
- ◆ Households with drug-using adults: 11%

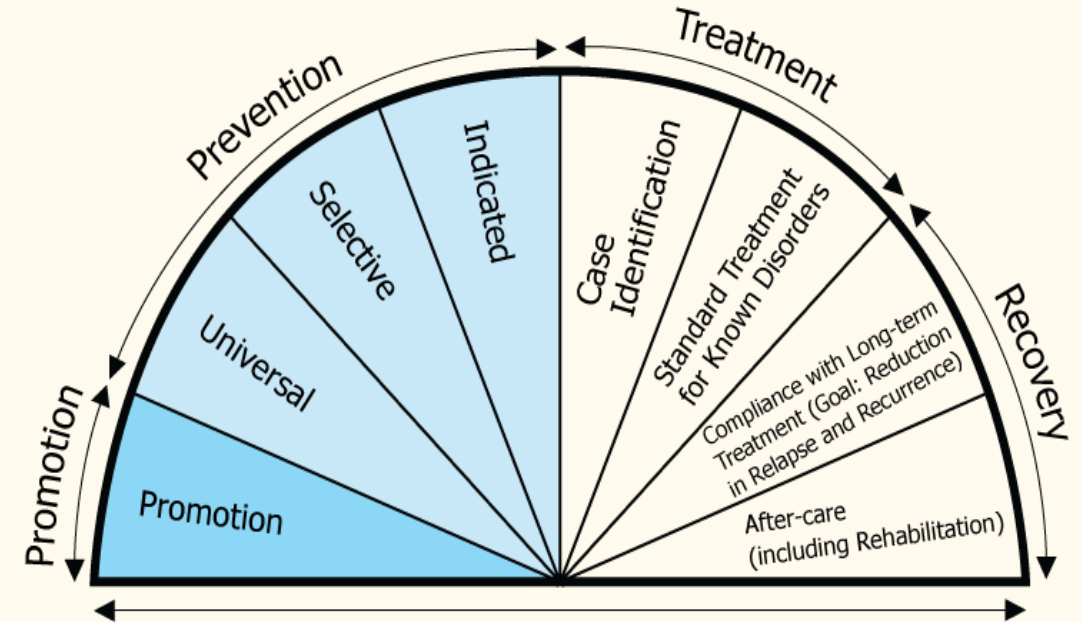
### Services received

- ◆ HRF: 3.4%
- ◆ ADHD treatment: 5.8%
- ◆ Dropout consultation: 3.5%

# 2013-2016 school attending adolescents who used drugs (MOE)

- ❑ Illegal drug use in the underage population in Taiwan: lifetime prevalence <1%
- ❑ Past-year prevalence of illegal drug use in students aged 12-17: **0.09 %**

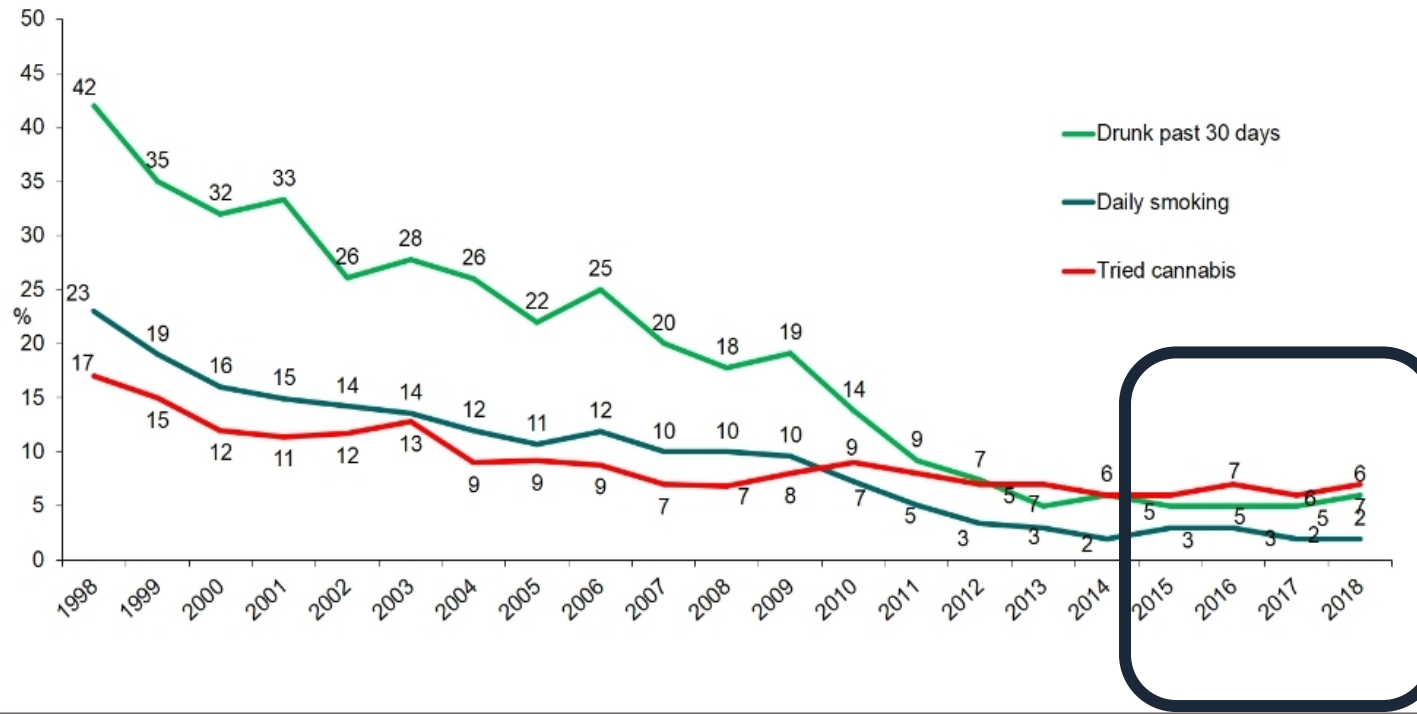
- 4-year cumulative rate of re-reporting drug use: **37.8% (34.9%<sub>j</sub> 40%<sub>s</sub>)**
- Among junior high school students, receiving CPS intervention (i.e., history of high-risk family intervention) in earlier life was associated with a **43% reduced risk of continued use.**
- Receiving drop-out consultation may elevate the hazard of continued use by 29% and 69%



# “Iceland model” what evidence shows: 冰島模式

Positive development over 20 years (10<sup>th</sup> grade students)

Substance use in Iceland 1997-2018



## Drug-free Iceland

To change the actual behavior of youth and not only their attitudes

## Examples of local actions

1. Research as a basis for policy and actions
2. Strengthen **parent** organizations and **cooperation** with schools
3. Support extracurricular activities/sports
4. Support active NGOs
5. Support young **people at risk in schools**
6. Anti smoking / drinking campaigns
7. **Strengthen social capital**



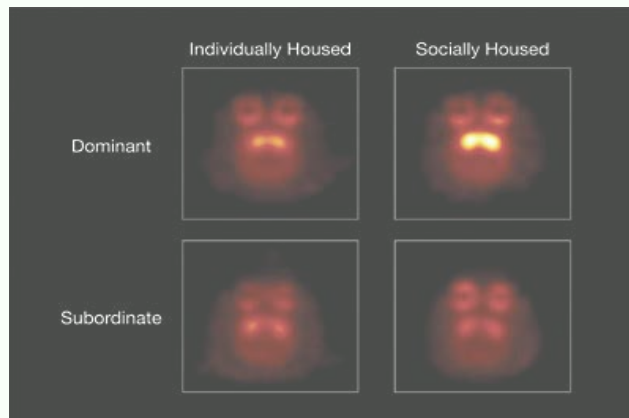
# Alterations in an organism's environment can produce profound biological changes that have important behavioral associations, including vulnerability to addiction



**Rat park by Bruce K. Alexander**

- **Universal:** Easy access to alcohol in the community/household; resource-deprived community/school
- **Selective:** disadvantaged socioeconomic condition/household with drug-using members (ACEs)
- **Indicated** intervention: not just smoke (family and school)

- The intervention on substance use problems and harm in young people needs a cross-system collaborative input
- Evidence-based practice; evaluation



**PET: Dopamine D2 receptors and cocaine self-administration in cynomolgus macaque**



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