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# Drug Use and Attitudes toward COVID-19 Vaccination in a Representative Sample of Undergraduate Students

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# Presentation Outline

1. Motivation and Research Questions
2. Measurement and Data
3. Analysis and Findings
4. Concluding Remarks

# 1

## Motivation and Research Questions

# Attitudes toward COVID-19 Vaccination

- The investigation of the drugs-vaccine connection is worthwhile within the domain of public health
- Drug users are commonly perceived as
  - persons who care less about their health
  - patients (rather than criminals), as repeatedly found in general population and other surveys
- The medical model prevails in the public understanding of drug use in Europe
- But do drug users care less about protecting themselves from COVID-19 infection and subsequent risks?

# Relevant Research

- A study of **substance use disorder program clients** in California, conducted before COVID-19 vaccines were available, showed that **only about 40% trusted** that a vaccine would be safe and effective (Masson et al. 2021).
- Regarding willingness to get vaccinated, applying paired comparisons, Spechler et al. (2021) reported **no difference** between a group of 45 persons who had used **cannabis  $\geq 10$  times** in their life and a group of 45 persons who had used **cannabis  $< 10$  times**.
- However, the same study also found that, among cannabis users only, **higher** lifetime use was **negatively** correlated with **willingness** to get vaccinated.

# Relevant Research

- A study in Maryland, USA, concluded that people with a history of **injection** drug use were **less likely to have been vaccinated** (Cepeda et al., 2022)
- Yang et al. (2021) on the other hand observed **no effects** of cigarette smoking, e-cigarette use, marijuana use or heavy drinking on vaccine hesitancy.
- Nearly **one third of people injecting drugs** in the US-Mexico border region were found to be COVID-19 **vaccine hesitant** (Strathdee et al. 2022).
- O'Rourke et al. (2022) reported **no association** between **smoking, cannabis** or **alcohol use** and willingness to get vaccinated.

# Research Questions

- RQ1 (primary): Does drug use affect willingness to get vaccinated?
- RQ2 (secondary): What are some other factors affecting willingness to get vaccinated?

# 2

## Measurement



# Measurement

- National Undergraduate Student Survey on Addictive Behaviors, Cyprus, Fall 2021
- Funded by the *National Addictions Authority of Cyprus*
- Main objective: to estimate the **prevalence** of drug use and gambling among students in Cyprus
- Target population: undergraduate students (offline degrees)
- **Cluster sampling**: 120 audiences selected from 32 institutions (proportional to population)
- Depending on restrictions, the audiences were either visited for **in-person** group administration (54.1%) or directed to answer the questionnaire **online** (45.9%)
- The questionnaire was successfully completed by **2882** students.

# Questionnaire

- **Substances**
  - tobacco
  - electronic cigarettes
  - alcohol
  - marijuana
  - tranquilizers/sedatives
  - MDMA/ecstasy
  - amphetamines
  - cocaine
  - heroin
  - LSD
  - mephedrone
  - GHB
  - cannabinoids
  - ketamine
  - PCP
- **Questions for each substance**
  - Lifetime (lifetime use)
  - Last 12 months (recent use)
  - Last 30 days (current use)
- **Demographics**
  - gender
  - age
  - high school grades
  - parents' education
  - family income
  - citizenship
  - living alone
- **Other**
  - Marijuana acceptance
  - Religiosity

# Attitude toward Vaccination (ATV) Item

The following question is about the COVID-19 coronavirus. Let's assume that you have not been infected or vaccinated: would you get vaccinated if you had the opportunity to do so now?

Yes

I am not sure

No

Recoded into willingness to get vaccinated:

Yes → 1

No → 0

Not sure → missing

# 3

## Analysis and Results

# Variable Descriptives – Independent Variables (Drug Use)

(Valid N from 2826 – 2882)

Alcohol L30d (ordinal 4 levels)	73.20%
Smoke L30d (ordinal 6 levels)	42.70%
Drunk L12m (binary)	39.00%
Heat-not-burn L30d (ordinal 6 levels)	36.50%
<b>Nine Drugs (binary)</b>	18.60%
Marijuana L30d (ordinal 4 levels)	10.70%
Tranquilizers L12m (binary)	8.00%
• Cocaine L12m (binary)	2.20%
Cannabinoids L12m (binary)	2.20%
• MDMA L12m (binary)	1.90%
• LSD L12m (binary)	1.40%
• Amphetamines L12m (binary)	0.60%
• Ketamine L12m (binary)	0.60%
• Mephedrone L12m (binary)	0.40%
• GHB L12m (binary)	0.40%
• Heroin L12m (binary)	0.30%
• PCP L12m (binary)	0.30%

# Variable Descriptives – Independent Variables (Other)

(Valid N from 2671 – 2882)

Gender (used as binary)	46.5% male
Age (ratio, min-max 17-41)	Mean = 21.39, median = 20 sd = 3.58
Highschool GPA (ordinal 1-3)	GPA <15/20 = 12.9% GPA 15-18/20 = 51.5% GPA >18/20 = 35.6%
Parents' education (ordinal 2-8)	Mean = 4.98, median = 5 sd = 1.63
Family income (ordinal 1-7)	Mean = 1.20, median = 3 sd = 1.74
Citizenship EU_nonCY	26.6%
Citizenship nonEU_nonCY	9.1%
Living alone	22.6%
Marijuana OK (Likert 1-5)	Mean = 2.87, median = 3 sd = 1.31
Religiosity (ordinal 1-5)	Mean = 3.45, median = 4 sd = 1.30

# Variable Descriptives – Dependent Variable

<b>ATV</b> (Attitude toward Vaccination) Direction: willingness to get vaccinated	<b>ALL SAMPLE (N = 2882)</b>
	YES = 1638 (56.8%) NO = 820 (28.5%) not sure = 412 (14.3%) missing = 11 (.4%)
	<b>ANALYSIS SAMPLE (N = 2459)</b>
	YES = 1638 (66.6%) NO = 820 (33.4%)  not sure → missing

**Bivariate Relationships & Multivariate Effects of X Variables on ATV**  
**(All >1% Prevalence Drugs as Separate Variables)**

INDEPENDENT VARIABLES	Bivariate coefficient $\gamma$ or $B$ (logistic)	Multivariate coefficient $B$ (logistic)
Gender male	$\gamma = .164^{***}$	.288**
Age	$B = .049^{***}$	.052**
Highschool GPA	$\gamma = .341^{***}$	.569***
Parents' education	$B = .151^{***}$	.075*
Family income	$B = .254^{***}$	.175***
European non Cypriot	$B = .090$	-.197
Non European	$B = .408^*$	.674**
Living alone	$\gamma = .042$	-.196
Smoke L30d	$B = -.050^*$	-.094**
Heat-not-burn L30d	$B = -.039$	-.029
Alcohol L30d	$B = .135^{***}$	.076
Marijuana L30d	$B = .000$	-.140
Drunk L12m	$\gamma = .065$	-.020
Tranquilizers L12m	$\gamma = .072$	.299
MDMA L12m	$\gamma = .246$	.049
Cocaine L12m	$\gamma = .108$	-.448
LSD L12m	$\gamma = .001$	-.002
Cannabinoids L12m	$\gamma = -.160$	-.234
Marijuana OK	$B = .128^{***}$	.049
Religiosity	$B = -.389^{***}$	-1.378**

\*\*\* p<0.001  
 \*\* p<0.01  
 \* p<0.05  
 ~ p<0.10

Binary Logistic Model  $\chi^2 = 263.133^{***}$ , Cox & Snell  $R^2 = .125$ , Nagelkerke  $R^2 = .174$ <sup>16</sup>



## Bivariate Relationships & Multivariate Effects of X Variables on ATV (with Nine Drugs Index)

INDEPENDENT VARIABLES	Bivariate coefficient $\gamma$ or $B$ (logistic)	Multivariate coefficient $B$ (logistic)
Gender male	$\gamma = .164^{***}$	.291**
Age	$B = .049^{***}$	.050**
Highschool GPA	$\gamma = .341^{***}$	.572***
Parents' education	$B = .151^{***}$	.076*
Family income	$B = .254^{***}$	.175***
European non Cypriot	$B = .090$	-.206
Non European	$B = .408^*$	.677**
Living alone	$\gamma = .042$	-.194
Smoke L30d	$B = -.050^*$	-.086**
Heat-not-burn L30d	$B = -.039$	-.031
Alcohol L30d	$B = .135^{***}$	.078~
Marijuana L30d	$B = .000$	-.083
Drunk L12m	$\gamma = .065$	-.028
Tranquilizers L12m	$\gamma = .072$	.294
Cannabinoids L12m	$\gamma = -.160$	-.236
<b>Nine drugs index</b>	$\gamma = -.001$	-.334~
Marijuana OK	$B = .128^{***}$	.058
Religiosity	$B = -.389^{***}$	-1.334**

\*\*\* p<0.001  
\*\* p<0.01  
\* p<0.05  
~ p<0.10

Binary Logistic Model  $\chi^2 = 265.438^{***}$ , Cox & Snell  $R^2 = .126$ , Nagelkerke  $R^2 = .175$

# 4

## Concluding Remarks

# Concluding Remarks

- **RQ1: Does drug use affect willingness to get vaccinated?**
  - Only smoking (tobacco), in the negative direction
  - Rest of the drugs measured: no statistically significant effect
  - Nine Drugs Index: no statistically significant effect (but  $p < .10$ )
- **RQ2: What are some other factors affecting ATV?**
  - More positive ATV expressed by students who
    - are male
    - are older
    - have a higher high-school GPA
    - have more educated parents
    - have parents of higher income
    - are not European
  - More negative ATV expressed by students who
    - are more religious

## Concluding Remarks

- Given the size and representativeness of the sample, the finding that **drug use does not affect ATV** is valuable in understanding and in responding to vaccination hesitancy, especially within the public health approach to substance use.
- The **anti-vax effect of cigarette smoking** is the notable exception, suggesting that smokers might be less concerned about infection and subsequent complications. As evidence that smokers who are infected are at a higher risk to progress to severe conditions accumulates (Patanavanich & Glantz, 2020), this finding is of special concern.

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End of Presentation

*Thank you very much for your attention!*

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