

Association between Past-Year Marijuana Use and Past-Year Suicidal Ideation among Young Adults aged 18-25

John Platt

Data Analytics Department
Research Advisor Dr. Zhe Wang

Background

We derived the following insights performing initial exploration:

- Between 2021 and 2023, 14.2% of U.S. young adults (age 18-25) had a co-occurring substance use and mental health disorder, which is more than other subgroups.
- Between 2021 and 2023, about a quarter of U.S. young adults reported using marijuana in the past year, and the weighted average past-year marijuana use for young adults was 53.74 days, which was more days than past-year alcohol use.
- Between 2021 and 2023, greater than 10% of U.S. young adults experienced suicidal ideation.

Previous studies found marijuana use to be associated with lower brain orbitofrontal cortex (OFC) gray matter volume, which is important for emotional regulation, decision-making, and behavioral control.

Research Question

To what extent is past-year marijuana use associated with past-year suicidal ideation among young adults aged 18-25?

Data & Methods

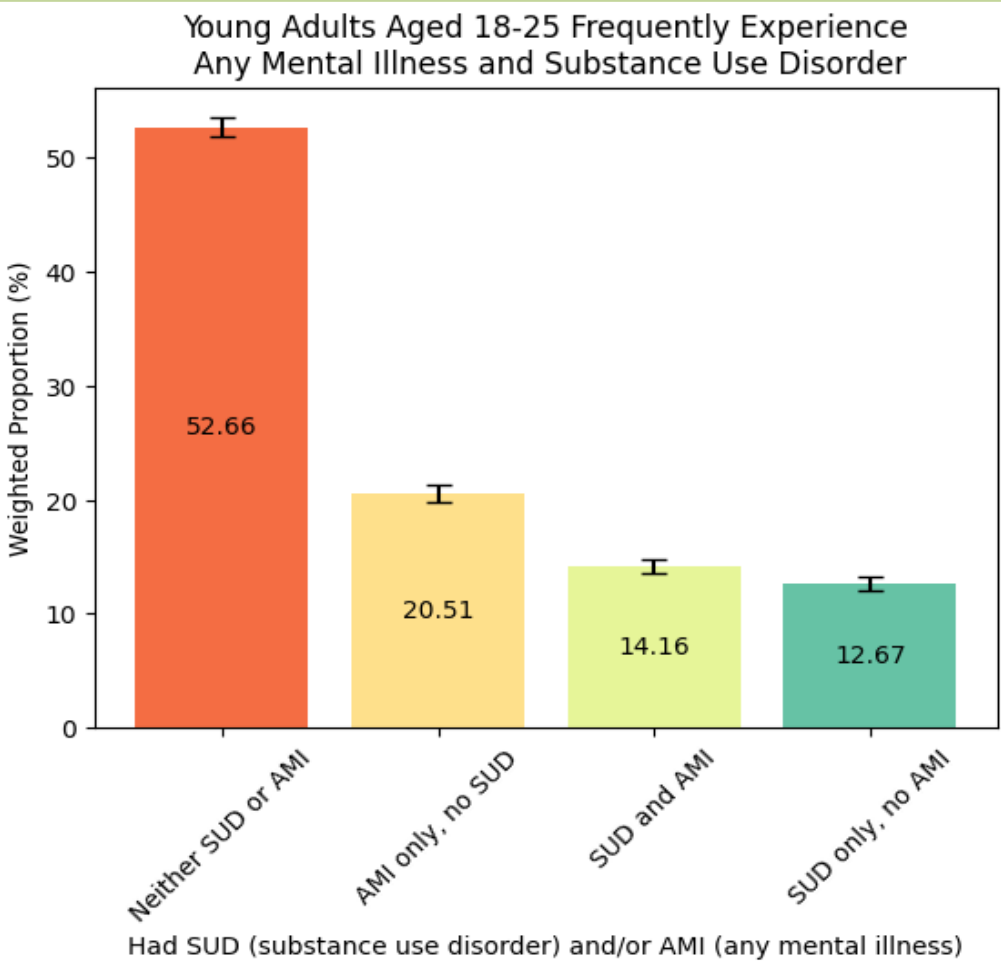
Data Source:

- 2021-2023 National Survey on Drug Use and Health (NSDUH)** – Leading source of population-based statistical data on drug use, mental health, and receipt of behavioral treatment

Methods:

- Exploratory Data Analysis** – Survey-weighted bar plots with error bars, Chi-square tests, Mann-Whitney U tests
- Logistic Regression** – Examine the linear association between past-year marijuana use and past-year suicidal ideation
- Restricted Cubic Splines (RCS)** – Examine the non-linear association between past-year marijuana use and past-year suicidal ideation

Main Results

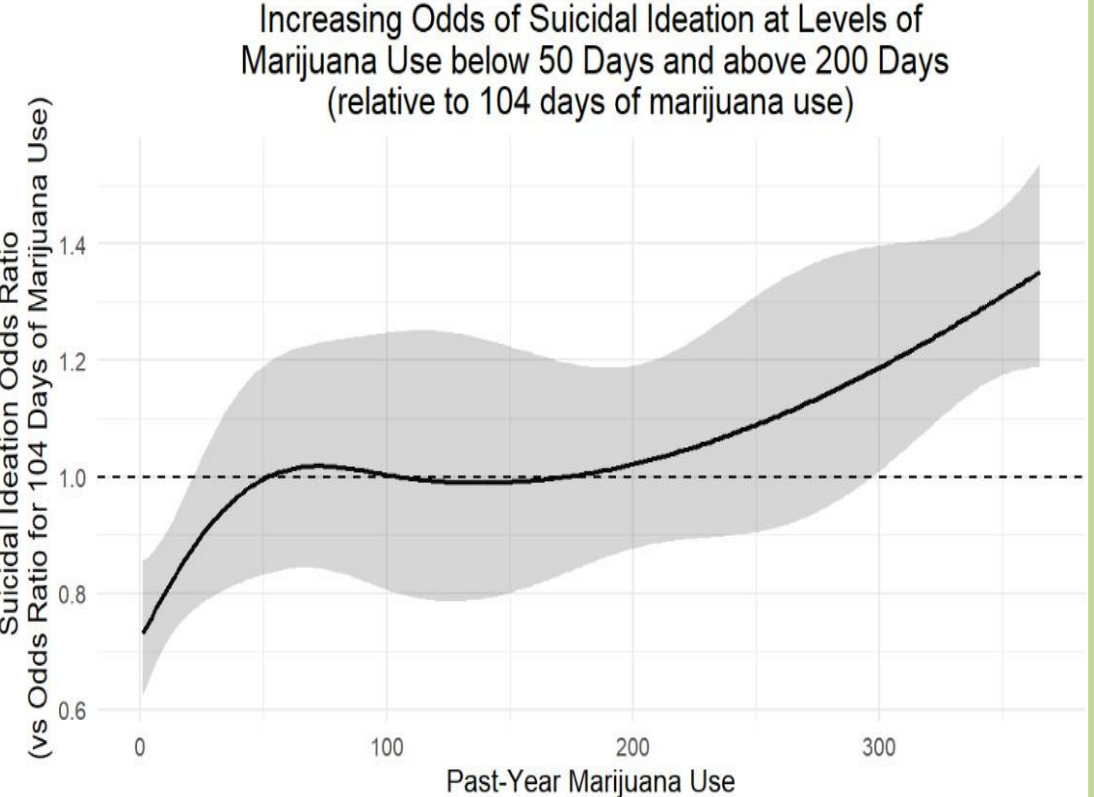
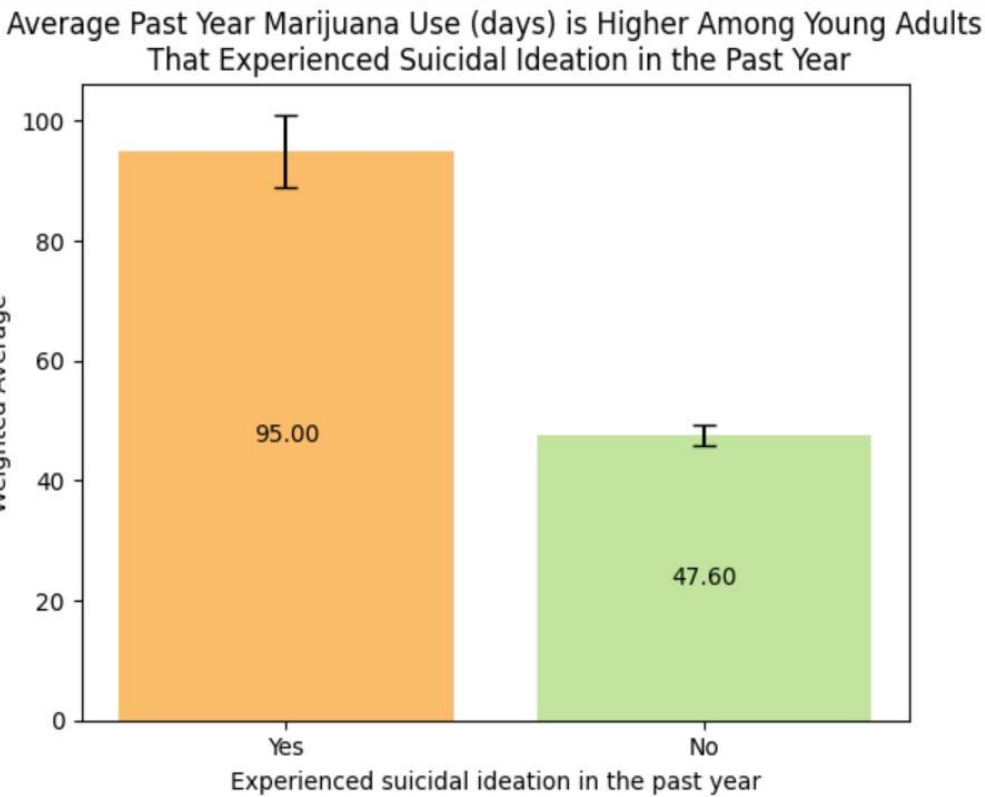


Increased Odds of Suicidal Ideation for Higher Levels of Marijuana Use

Past Year Marijuana Use	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
0-90 days (ref)	1.00	1.00
90-180 days	2.04 (1.62, 2.57)*	1.68 (1.16, 2.44)*
180-270 days	2.13 (1.76, 2.58)*	1.55 (1.13, 2.13)*
270-360 days	2.72 (2.39, 3.09)*	1.48 (1.16, 1.90)*

* p -value < .05 indicating a significant association

Unadjusted and adjusted odds ratios measure the association without and with significant covariates respectively, including sociodemographic (e.g., race, household size), substance use (e.g., alcohol use, cigarette use), and mental health (e.g., nervousness) characteristics.



Discussion

-Findings

We found the following:

- A **strong, positive association** between past-year marijuana use and past-year suicidal ideation among young adults aged 18-25, even after adjusting for sociodemographic, substance use, and mental health covariates
- A **non-linear association** between past-year marijuana use and past-year suicidal ideation with a plateau in odds of suicidal ideation at 50-200 days of use

-Public Health Implications

These results inform public health policy makers, clinicians, epidemiologists, and colleges around the U.S. on the importance of marijuana use prevention and minimization.

-Limitations

- Lack of causality** due to no temporality
- Bias** including recall bias, self-report bias, misclassification bias, and overadjustment bias
- Residual confounding** including discrimination and impulsivity

Next Steps

- Cohort and RCT (randomized controlled trial)** studies on the marijuana use-suicidal ideation association to add in temporality
- Adjusted RCS model** to account for variables that weren't included in our original RCS model

Acknowledgements

I would like to thank Dr. Zhe Wang for her guidance throughout my senior capstone project. Gratitude is also noted to Dr. Ehab Farag of the Global Health department.

Works Cited

- Filbey et al. 2014. "Long-term Effects of Marijuana Use on the Brain." *PNAS* 111(47): 16913–16918.
- SAMHSA, Center for Behavioral Health Statistics and Quality. *NSDUH Combined Public-Use Data Files, 2021–2023*. U.S. Department of Health and Human Services.