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Our goal is to identify predictors of non-medical opioid use for students aged 18-24. As students, we believe that this age bracket is a window of opportunity to deter opioid abuse and thus lower nationwide opioid addiction rates. An estimated 4% to 19.7% of students have misused prescription opioids, with higher estimates for certain student populations (Weyandt 2020). We hope our analysis helps in early identification of at-risk groups for drug misuse, and that this information will be useful in the development of public health resources, i.e. informative drug prevention programs.

Our question: Which variables are predictors for students aged 18-24 for NMU lifetime opioid use? We were interested in the following variables: (a) having a mental health disorder diagnosis, (b) marijuana laws in one's state of residence (recreationally and medically legal vs. illegal), (c) gender, and (d) involvement in Greek life.

We primarily used four binary variables to build our model. Three of them came from the existing dataset, and we created a fourth variable showing marijuana legality by state, with 0 being illegal and 1 being fully legal by the end of the first quarter of 2018. These variables all seemed to contribute to the probability of an 18- to 24-year-old college student using opioids non medically and are all statistically significant.

On this slide, we see a general map of the percentage of people aged 18-24 who have used opioids non-medically. Darker colours represent a higher percentage of respondents using opioids non-medically, and gray represents stated with no data or with fewer than 10 respondents. It's interesting to note that 13 states have a percentage above 20%, with 6 states having a percentage above 25%. This shows that opioid problem in our country amongst young people differs by state, and what our variable for marijuana legality, which differs by state, tries to control for.

Our primary method for exploring this question was through a forward stepwise logistic regression model. We elected to use a logistic regression model because our response variable is a two-level categorical (no lifetime opioid NMU vs lifetime opioid NMU). The criterion for the stepwise selection was Akaike's Information Criterion (AIC). Since multiple comparisons were being done, significance for each variable was checked by using a Holm correction in order to control the family-wise error rate (FWER). Next, k-fold cross validation with k=4 was used to avoid overfitting. Given that the model coefficients as well as the area under the curve (AUC) remained stable across each fold, the model was deemed equipped to predict using another survey. Finally, a large cross-validated AUC was calculated as an indicator of the model's predictive power.

Our cleaned dataset consisted of 1277 student respondents aged 18-24. We found a statistically significant decrease in the odds ratio for lifetime opioid NMU associated with being female (95% CI:

0.34, 0.63) and not having a mental health disorder diagnosis (95% CI: 0.27, 0.50), compared to a statistically significant increase for involvement in fraternities or sororities (95% CI: 1.71, 3.58), and the legalization of recreational marijuana (95% CI: 1.03, 2.03).

In conclusion, our analysis identifies certain factors which may be associated with lifetime occurrence of opioid drug misuse. Although we cannot determine any causation, we hope that our findings will assist in the early identification of at-risk student populations. Next steps might include reproducing our analysis using a representative sample of the population, as well as running our model on datasets from different years.

Works Cited

Weyandt, Lisa et al. (2020). Prescription opioid misuse among university students: A systematic review. *Journal of American College Health*. doi: 10.1080/07448481.2020.1786095