Biostatistics and Epidemiology Final Project

Introduction

* Is Marijuana a gateway drug? This is a serious debate that still rages on today in our world. Many politicians and advocates of legalization would claim that it is not; however, those against legalization would firmly stand by the notion that it is. What is the truth?
* This study hopes to capture the outcome of hard drug use when exposed to marijuana at any point in the subjects' lives.

Methods

NHANES:

* The NHANES dataset is survey data collected by the US National Center for Health Statistics (NCHS). The NHANES target population is "the non-institutionalized civilian resident population of the United States". NHANES can be treated as if it were a simple random sample from the American population.

Variables:

* Marijuana: Participant has tried marijuana. Reported for participants aged 18 to 59 years as Yes or No.
* RegularMarij:  Participant has been/is a regular marijuana user (used at least once a month for a year). Reported for participants aged 18 to 59 years as Yes or No.
* HardDrugs:  Participant has tried cocaine, crack cocaine, heroin or methamphetamine. Reported for participants aged 18 to 69 years as Yes or No.
* Gender: Gender (sex) of study participant coded as male or female

Inclusion/Exclusion Criteria:

* This inclusion criteria for this study was participants who did not have missing data for Marijuana, RegularMarij, HardDrugs, and Gender.
* The exclusion criteria was anyone who had missing data for those variables.
* The number of patients removed was 5,067
* The number of patients included was 4933

Tests used:

* I used chi square tests for the baseline characteristics. I used a hoslem test and likelihood ratio test for my multivariate model.

Results

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Table 1. Baseline Characteristics. Shows as n(%) with Chi-square test.

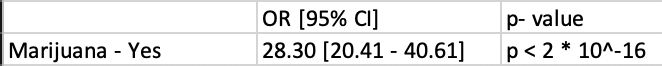


Table 2. Univariate Model

The odds of trying hard drugs in those who have tried marijuana is 28.30 times the odds of trying hard drugs in those who have not tried marijuana.

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Table 3. Multivariate Model

The odds of trying hard drugs in those who have tried marijuana is 12.08 times the odds of trying hard drugs in those who have not tried marijuana, adjusting for regular marijuana use and sex.

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Figure 1. ROC curve of multivariate model

Conclusion/Discussion

* The effect of the exposure seems clear: those who try marijuana are more likely to try hard drugs than those who have not tried marijuana. I did not expect this association because a lot of pro-legalization media would have one believe that this is not the case. I think this association was very meaningful.
* There is notable confounding that I detected. It seems that when adjusting for regular marijuana use and sex, that the likelihood of trying hard drugs decreases. This indicates that the estimate was being biased away from the null. When adjusting for these confounders the decrease in likelihood is substantial.
* Another important confounder that was not accounted for is age of first marijuana use and age of regular marijuana use. A multivariate model that includes these confounders may find a different relationship between the exposure and the outcome than I did.
* Possible biases include recall bias, as the subjects had to determine themselves whether they were a regular marijuana user which required remember if they use it monthly, which may be difficult for those who use infrequently but possibly frequently enough to be considered a regular user by the study's standards.
* The final public health message would be that trying marijuana increases the likelihood that one tries hard drugs but this doesn't mean that trying marijuana absolutely means one will try hard drugs.
* These results are generalizable to the rest of the United States population. All states, especially those that are legalizing marijuana should take note of the results of this study.