
STA 199 Team I

Laura Cai, Andy Chen,
Jaden Faunteroy, Luke Hardin



INTRODUCTION

Research Question:

How has the rate of marijuana and tobacco use changed from 2013 to 2018 in 18-25 year olds in North Carolina where marijuana is illegal and Colorado where marijuana was legalized in 2013; is there a significance difference between the two states?

Hypotheses:

Due to the legalization of marijuana in Colorado, there will be a more significant increase in the rate of marijuana usage in Colorado than in North Carolina, where marijuana has not been legalized.

Due to the legalization of marijuana in Colorado, there will be a more significant decrease in the rate of tobacco usage in Colorado than in North Carolina, where marijuana has not been legalized.

THE DATA: DRUGS



THE DATA

- Gathered from the annual National Survey on Drug Use and Health (SAMHDA)
- Possible biases: voluntary response rate– inaccurate reports or no reports

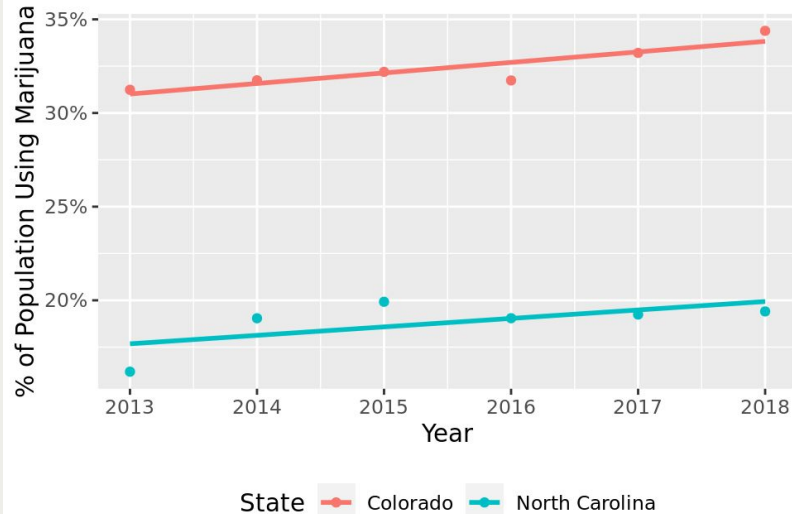
Includes:

- Alcohol, cigarette, cocaine, marijuana and tobacco use
 - 50 states and DC
 - 2002–2018
 - Age ranges from 12–17, 18–25, and 26+
 - We focused on marijuana & tobacco in CO, NC, 2013–2018, 18–25 year olds
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GRAPHS (EDA: Marijuana)



Marijuana Usage in CO and NC, 2013 - 2018
18 - 25 Year Olds



Source: SAMHDA

Marijuana in CO and NC

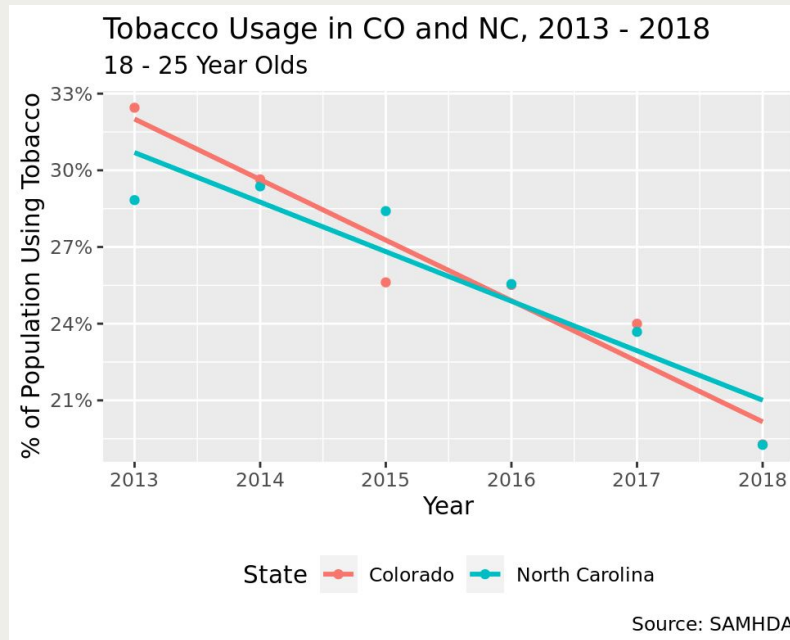
- Marijuana usage increased consistently up until 2018
- Very similar rates of changes
- Intercepts differ ~13%
- Little variation of data to line of best fit

GRAPHS (EDA: Tobacco)



Tobacco in CO and NC

- Tobacco usage decreased consistently up until 2018
- Similar slopes, similar intercepts
- Overall, Colorado's usage rate decreases a little bit more
- Little variation of data to line of best fit



RESULTS: marijuana

Marijuana usage in Colorado after legalization (2013 - 2018):

$$CO_marijuana_usage_rate = 0.3101 + 0.0056 * year$$

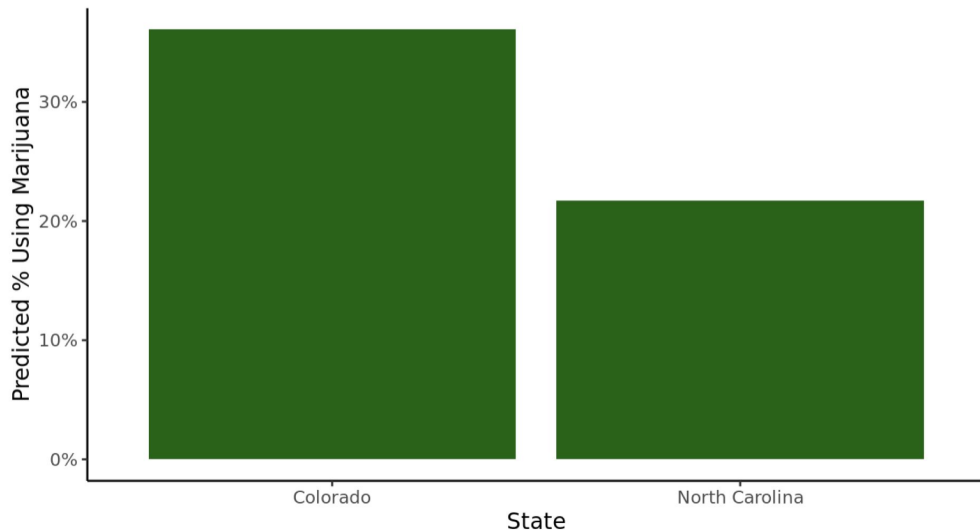
Marijuana usage in North Carolina 2013 - 2018:

$$NC_marijuana_usage_rate = 0.1768 + 0.0045 * year$$

Hypothesis Test: difference in regression coefficients?

- 0.0056 vs 0.0045
- Statistically significant difference?
- Used interaction model to find p-value: 0.7

Predicted % of 18 - 25 Year Olds Using Marijuana (2023)
Colorado & North Carolina



Results: tobacco



Tobacco usage in Colorado after marijuana legalization (2013 - 2018):

$$CO_tobacco_usage_rate = 0.3201 - 0.0237 * year$$

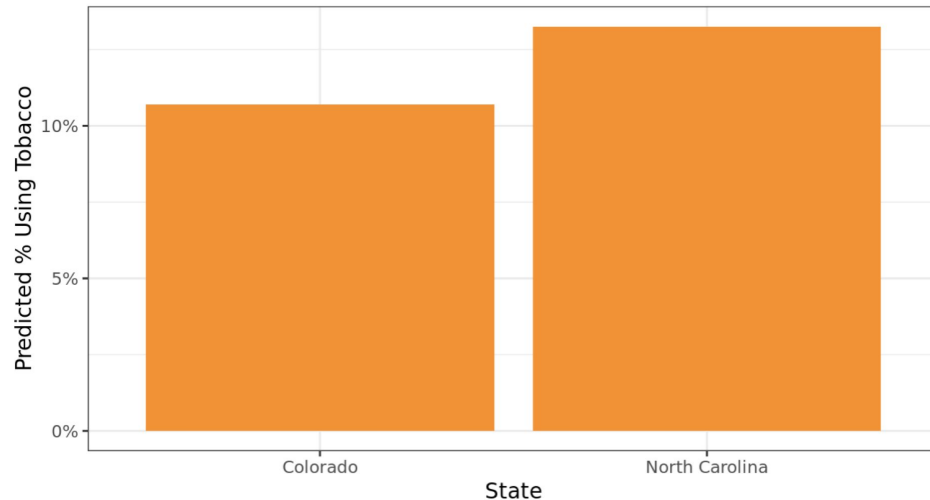
Tobacco usage in North Carolina 2013 - 2018:

$$NC_tobacco_usage_rate = 0.3070 - 0.0193 * year$$

Hypothesis Test: difference in regression coefficients?

- 0.0237 vs 0.0193
- Statistically significant difference?
- Used interaction model to find p-value: 0.4

Predicted % of 18 - 25 Year Olds Using Tobacco (2023)
Colorado & North Carolina



CONCLUSION



- Despite our hypothesis that legalization of marijuana increases marijuana use, the p-values give strong evidence to support that there is no difference in the increase in usage rates in CO vs NC for both marijuana and tobacco.
 - Legalization of marijuana doesn't affect the usage rates of marijuana and tobacco.
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