



# Prediction Model of Drug misuse based on Canadian Dataset

Team Name: The Outliers;

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# Introduction & Question of Interest

## Introduction

- ▶ Drug misuse: using drugs without medical or legal guidelines
- ▶ Demographic, psychiatric, behavioral variables
- ▶ Effects of chronic pain, acute pain, alcohol, tobacco, and cannabis on subsequent

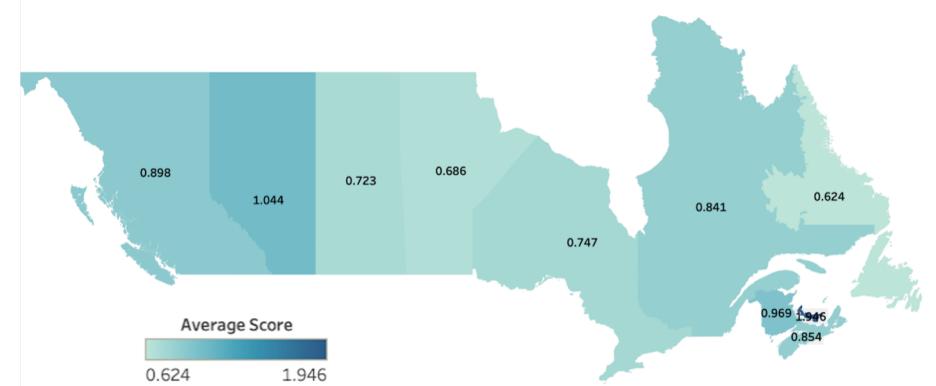
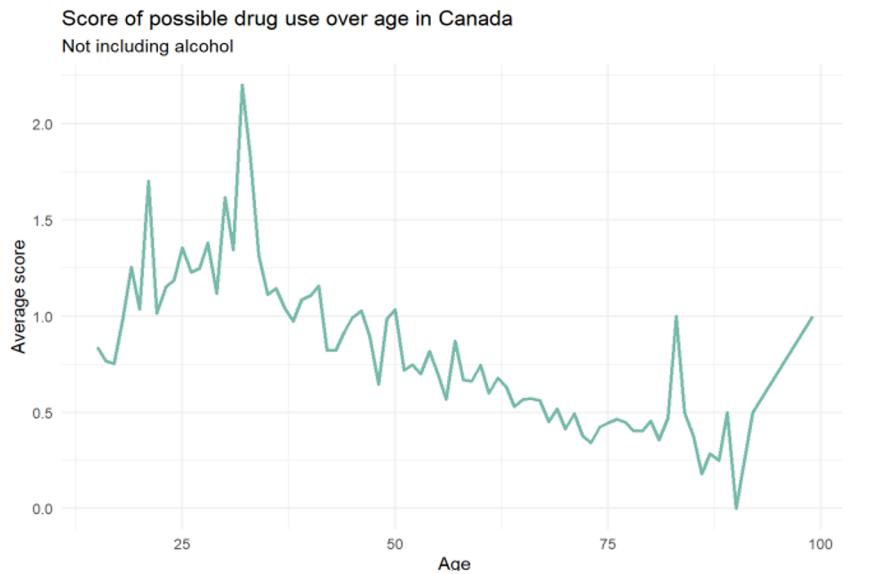
## Question of interest

- ▶ Drug, alcohol tobacco use and dependence
- ▶ Combinations of Drug misuse for Chronic and Acute patients

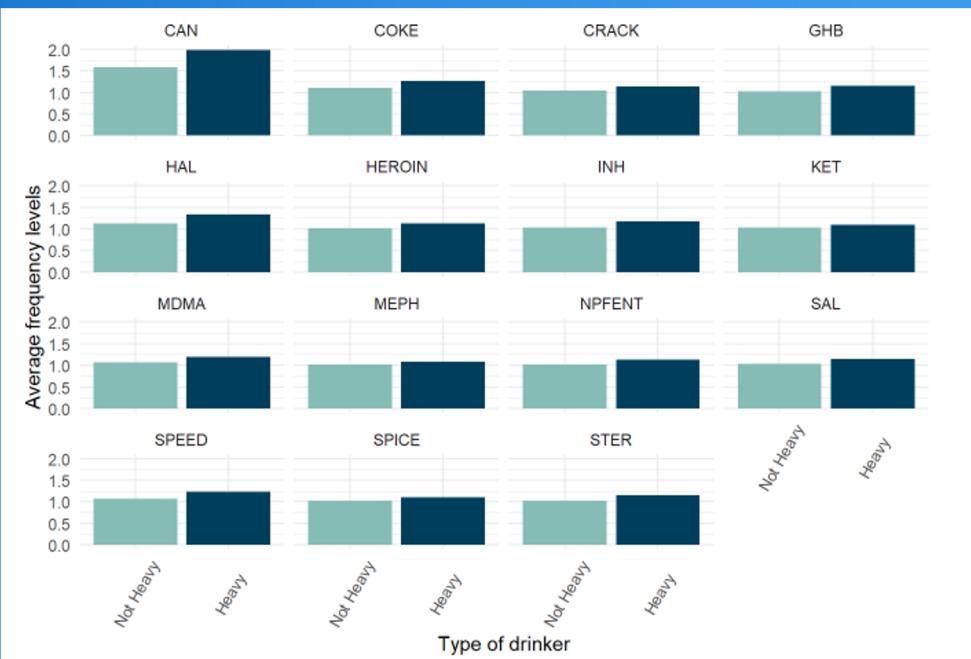


## Data Collection and Exploration - Driving Factors

- ▶ Average possible drug use score over age (1-10 scale)
- ▶ Higher the average score, more severe involvement with drugs (not including alcohol)

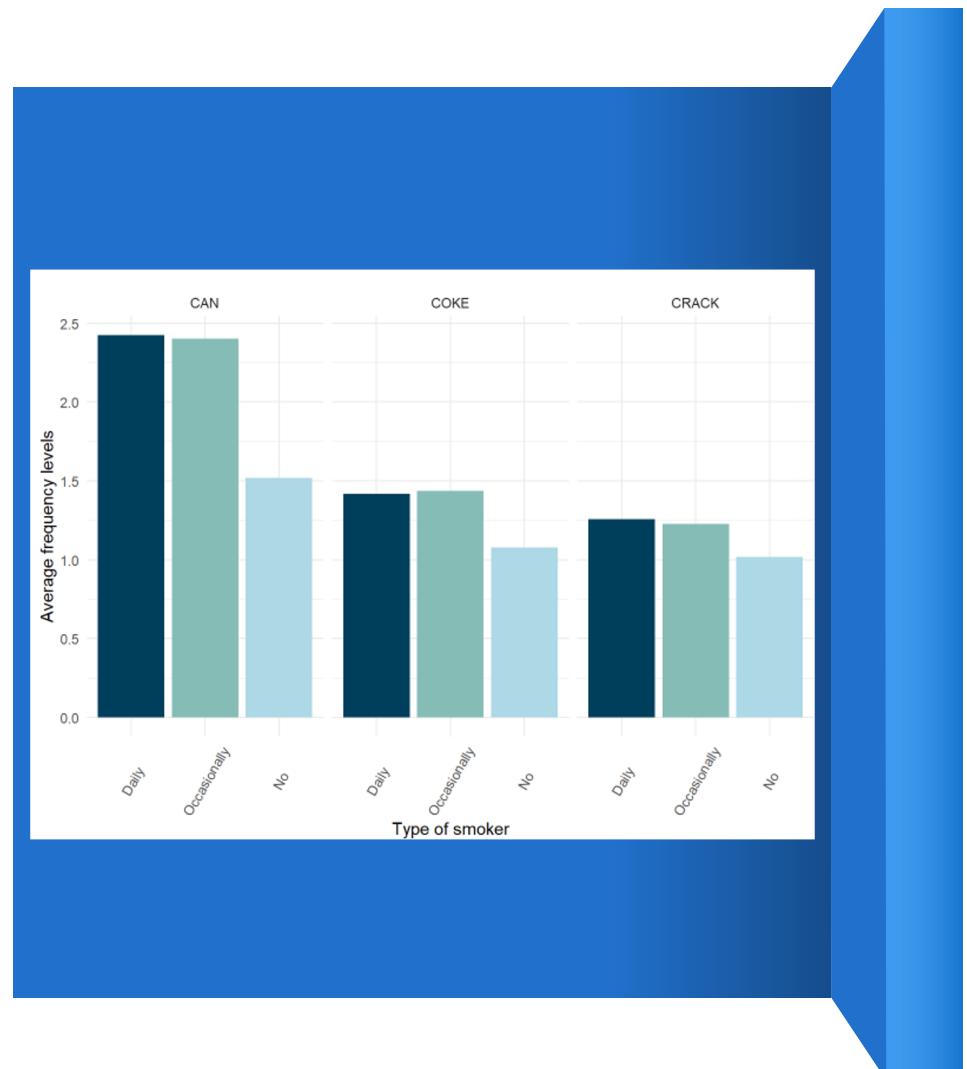


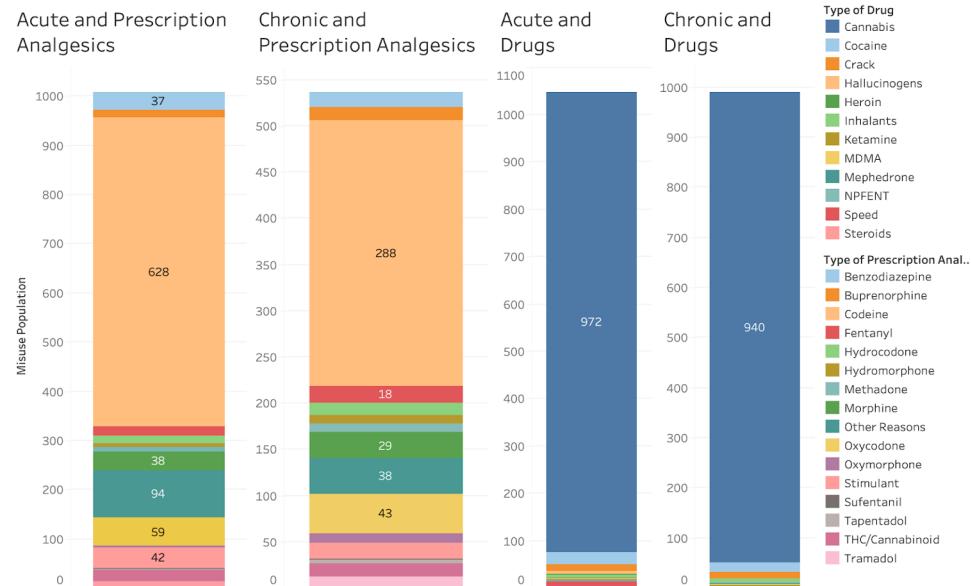
# Drinking Frequency



# Smoking Frequency

- Compare drug use frequency on a scale of 1 to 5 among respondents with varying drinking and smoking habits.
- Cannabis, cocaine, and ecstasy are more commonly used by drinkers and smokers.





- ▶ Each drug's total usage for people who have acute or chronic pain. We calculated the usage based on the frequency of different drug use.

# Models



```
Deviance Residuals:
    Min      1Q   Median     3Q     Max 
-1.7671 -0.9526 -0.7587  1.2537  2.9201 

Coefficients:
            Estimate Std. Error z value Pr(>|z|)    
(Intercept) -5.339203  1.458713 -3.660 0.000252 ***
edited_drug_USE 0.305693  0.204489  1.495 0.134938  
edited_ALC_FREQ_USE 0.247819  0.103885  2.386 0.017055 *  
edited_TOB_FREQ_USE 0.244326  0.118435  2.063 0.039116 *  
edited_PAIN_CHRONIC 0.954929  0.905365  1.055 0.291542  
PAIN_ACUTE_RX 0.950196  0.826262  1.150 0.250147  
OP_USE 2.382124  1.485747  1.603 0.108865  
DEM AGE -0.012172  0.003323 -3.663 0.000249 ***  
CAN_MED_USE 1.542455  0.738585  2.088 0.036762 *  
COD_USE 2.862880  0.633814  4.517 6.27e-06 ***  
PAIN_CHRONIC_RX -0.258524  0.769467 -0.336 0.736887  
edited_drug_USE:edited_ALC_FREQ_USE 0.068570  0.257673  0.266 0.790152  
edited_drug_USE:edited_TOB_FREQ_USE 0.270567  0.259919  1.041 0.297891  
edited_PAIN_CHRONIC:CAN_MED_USE -0.588539  0.464261 -1.268 0.204909  
edited_PAIN_CHRONIC:COD_USE -1.292256  0.920261 -1.404 0.160251  
CAN_MED_USE:COD_USE -0.748901  0.343580 -2.180 0.029280 *  
OP_USE:CAN_MED_USE -0.733365  0.803344 -0.913 0.361300  
OP_USE:PAIN_CHRONIC_RX 0.321765  0.772387  0.417 0.676982  
CAN_MED_USE:PAIN_CHRONIC_RX 0.526663  0.466933  1.128 0.259354  
PAIN_ACUTE_RX:OP_USE -0.966719  0.829362 -1.166 0.243769  
PAIN_ACUTE_RX:CAN_MED_USE -1.074528  0.560818 -1.916 0.055365 .  
edited_PAIN_CHRONIC:CAN_MED_USE:COD_USE 0.643536  0.476165  1.351 0.176536  
OP_USE:CAN_MED_USE:PAIN_CHRONIC_RX -0.607658  0.469418 -1.294 0.195496  
PAIN_ACUTE_RX:OP_USE:CAN_MED_USE  1.154829  0.563474  2.049 0.040415 *  
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

- We conducted a logistic regression model to verify the characteristics of drug, alcohol, tobacco usage on analgesics misuse.
- Response: Binary variable for misuse of medications, where 1 for respondents self-reported misuse on prescription analgesics, 0 otherwise.

# Findings

- People who consume alcohol, tobacco, medical cannabis, and codeine have a higher probability of misusing prescription analgesics.
- Combination of opioids use to treat acute pain, prescription opioid use API lifetime, and frequency of medical marijuana use, has a greater combined effect than the main effect estimates would suggest.
- Significant interaction effect between Codeine and medical marijuana use.
- Probability of misusing prescription analgesics decreases as people get older.

## Discussion & Limitations

### Future Questionnaire Recommendations:

- Age Question
- Lawful substances (liquor, tobacco, medical cannabis, and codeine)
- Frequency of Codeine use
- Frequency of medical Cannabis use

### Limitations:

- Mental illness have a very similar level of drug use compared to others
- Geographical distribution of drug abuse was unascertained
- We attempted to calculate model accuracy, but the calculation was hampered by unanticipated factors.

# Thank You for Watching

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