


Mental Health and Non-Medical Use (NMU) Drugs: A Closer Look

Team Members

Linh Nguyen
Bich Ha Nguyen
Amy Nguyen
Chau Vu

A decorative network diagram in the bottom-right corner, similar to the one in the top-left. It shows a web of interconnected nodes and lines, with some nodes highlighted by blue circles and others by blue dots.

The background of the slide features a complex, light gray network pattern. It consists of numerous small circles, some solid and some hollow, connected by thin, intersecting lines that form a web-like structure across the entire frame.

~50%

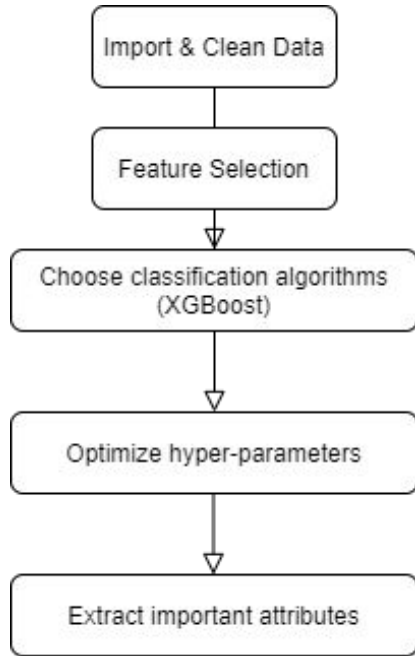
Individuals with Severe Mental Disorders Are
Affected by Substance Abuse.

Contents

1. Question: Is there a relationship between mental health issues and non-medical use drug ?
2. Feature Selection: Classification Model
3. Data Visualization: mental health, drugs category
4. Mental Health Issues x Drugs: Clustering Model
5. Recommendations
6. Shortcomings
7. Further Research

Classification Analysis

Workflow



Goal

Predict whether a person misuses any drugs and explore the relationship between mental conditions and drug misuse

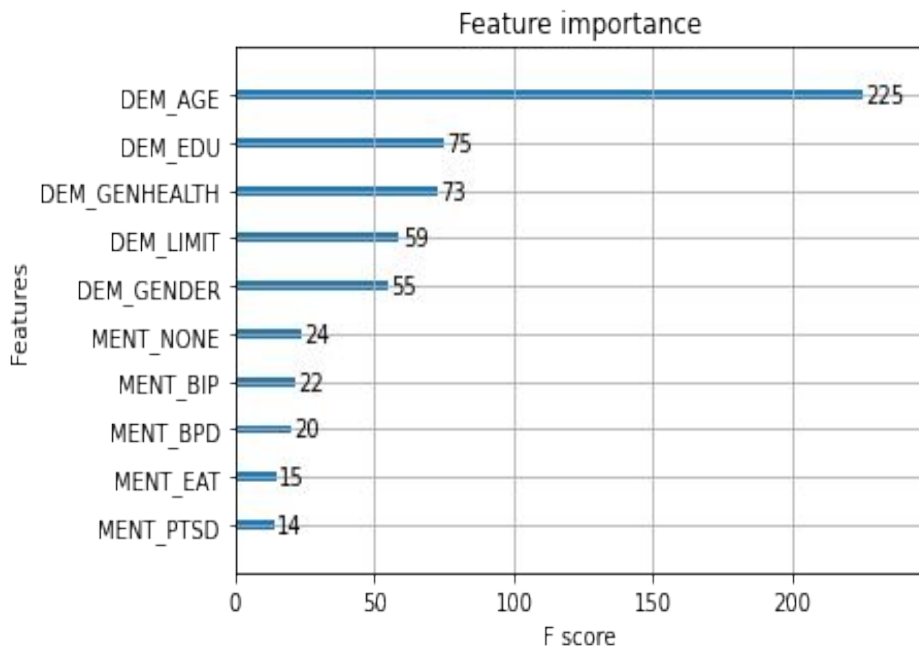
Target attributes:

< TYPE >_NMUYR (non-medical use drug past year), < TYPE >_NMU (non-medical use drug during lifetime)

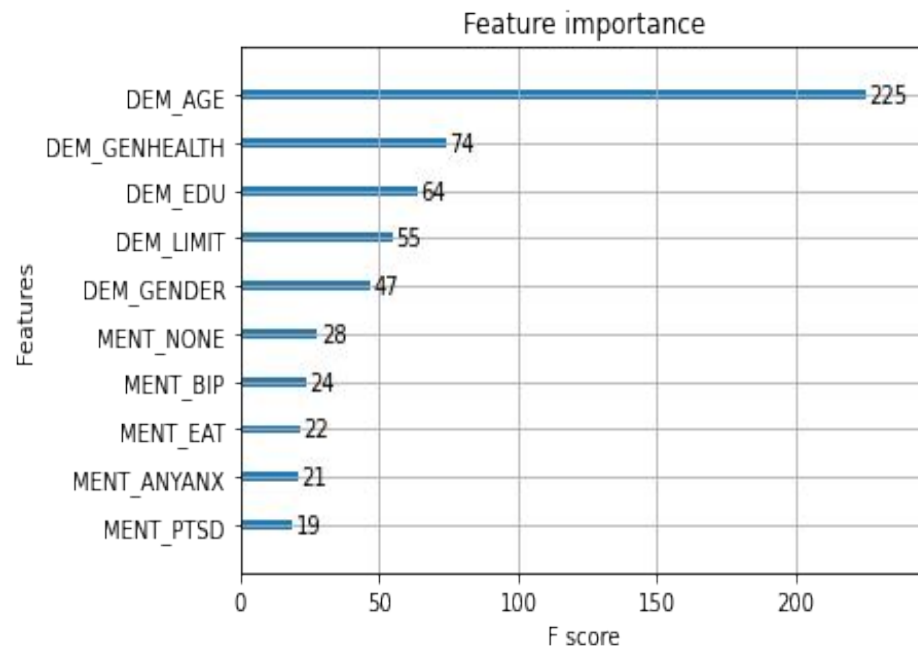
Predictive attributes

- Demographic attributes: age, general health, education, whether a person is limit in their usual activities
- Mental health conditions like autism, bipolar disorder, OCD, anxiety, eating disorders, etc.

Top 10 Most Important Features with Demographic Attributes

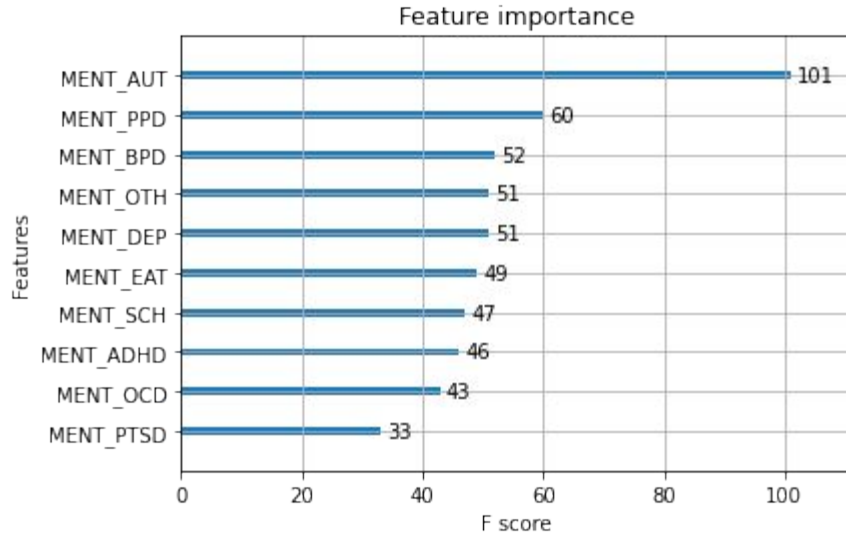


Lifetime drug misuse classification
Accuracy: 0.76 - 0.78

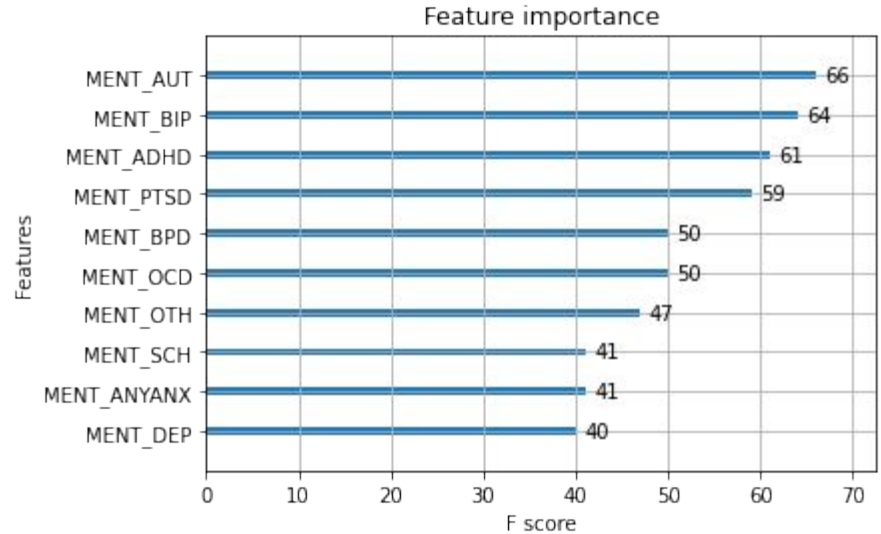


12-month drug misuse classification
Accuracy: 0.85 - 0.87

Top 10 Most Important Mental Disorders Attributes



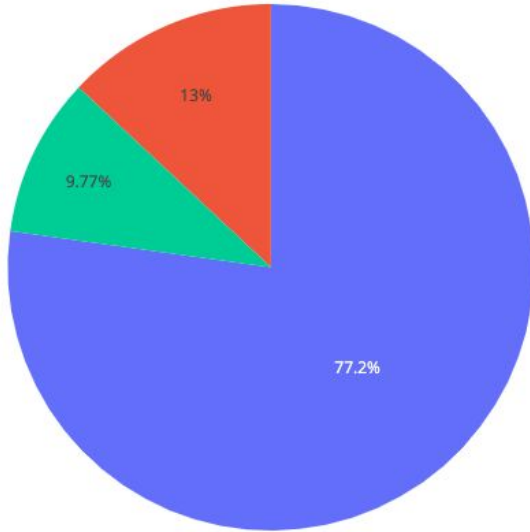
Lifetime drug misuse classification
Accuracy: 0.74 - 0.76



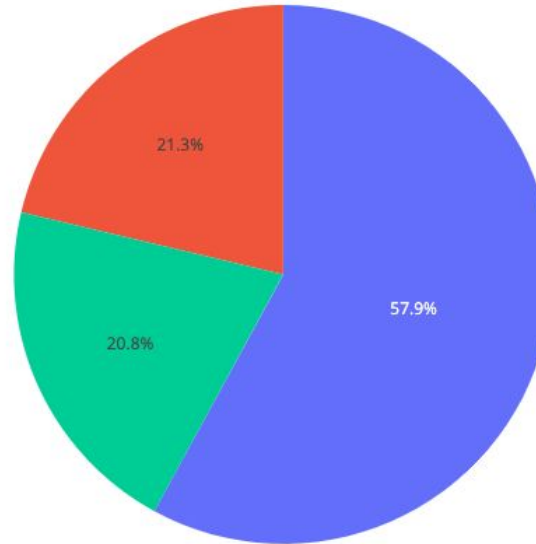
12-month drug misuse classification
Accuracy: 0.87 - 0.88

Comparison of Prevalence of Mental Illness in NMU and non-NMU Drug Users in Last 12 Months

Count of mental disorders for non-drug users - PAST YR

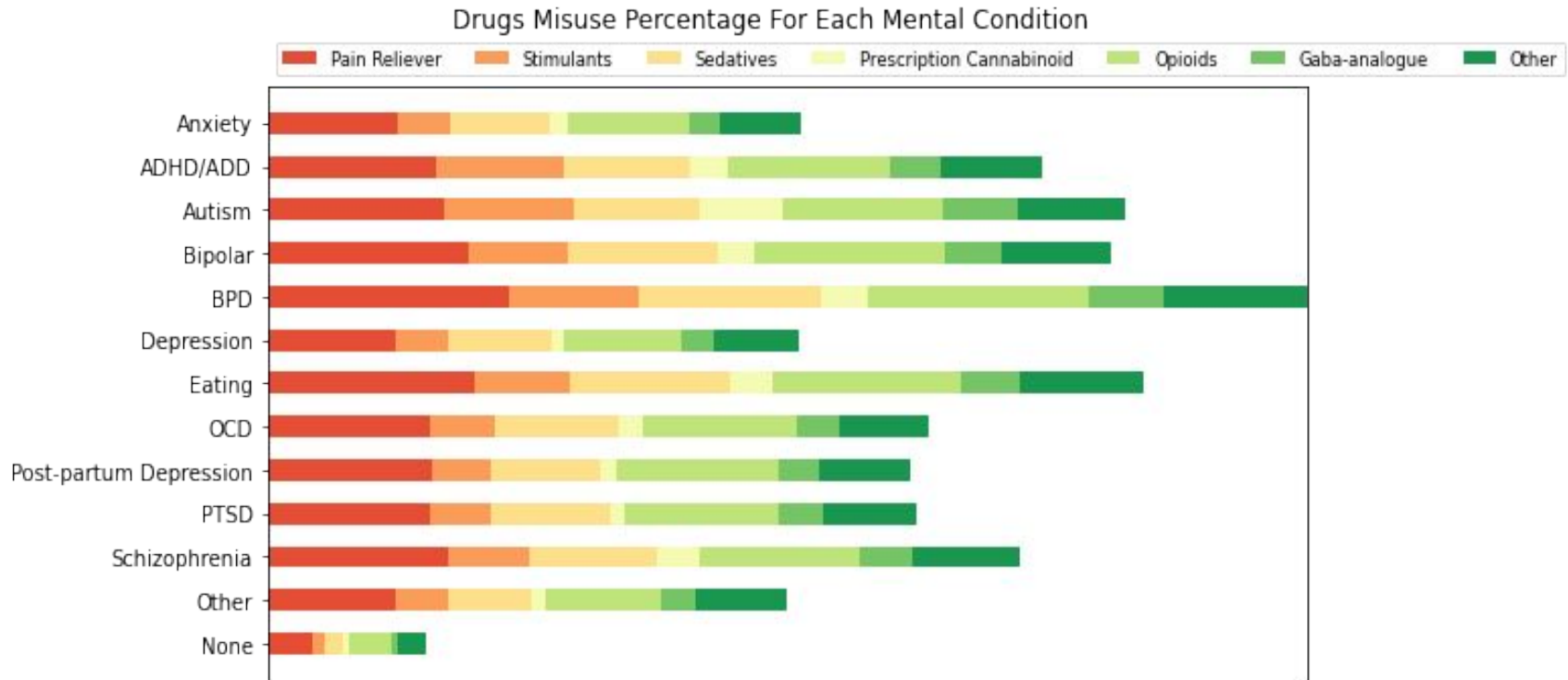


Count of mental disorders for drug users - PAST YR

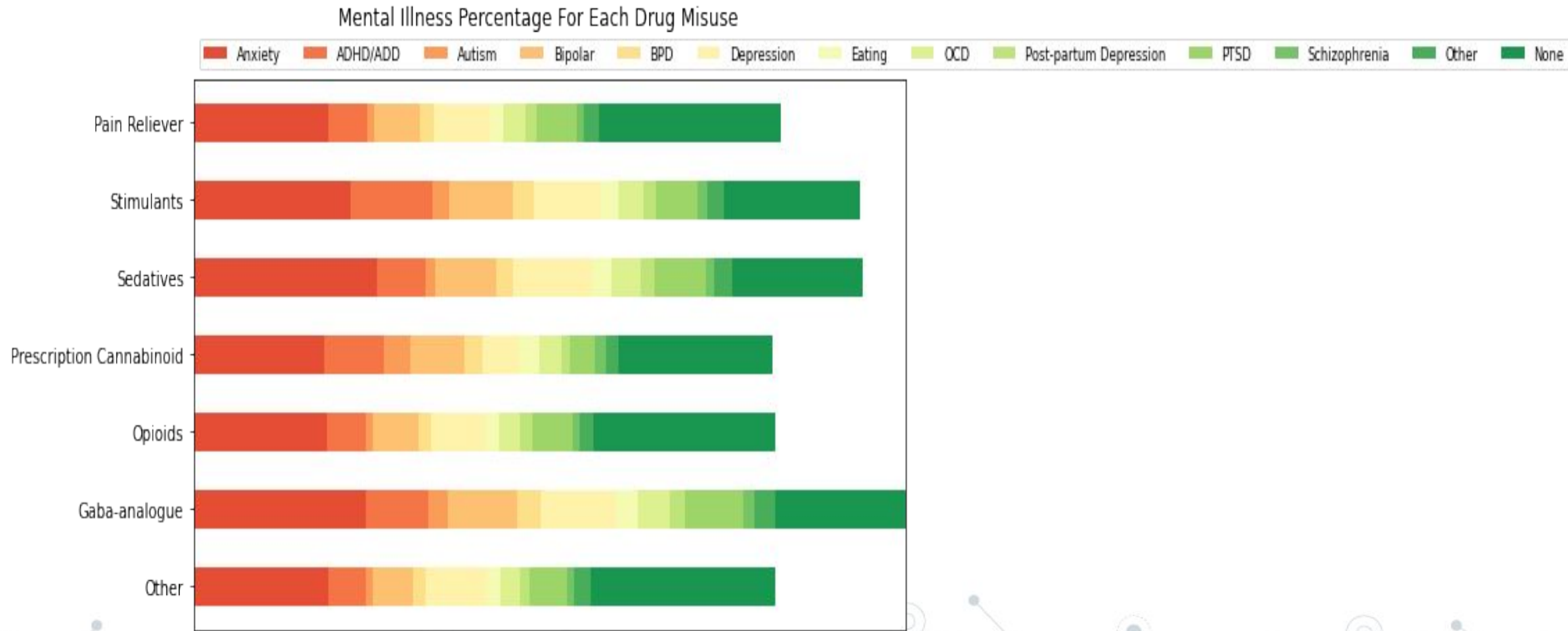


- No mental condition
- 1 mental health condition
- At least 2 mental condition

Mental Illness Percentage for Each Drug Misused

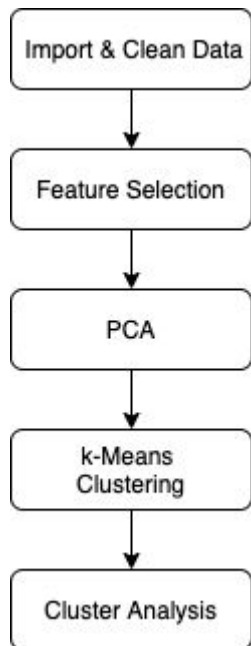


Drugs Misused Percentage per Mental Disorder



Cluster Analysis

Workflow



Feature used:

< TYPE >_NMUYR (non-medical use drug past year), ILL_YR (illicit drug use past year), and mental health variables

Optimal # of clusters: 9

Cluster Statistics:

| | N | % Tried NMU Drugs - Past Year | % Used Illicit Drug | Avg # Drug Types | Most Popular NMU Drug | 2nd Most Popular NMU Drug | % Ever Have Mental Health | Most Seen Mental Illness | 2nd Most Seen Mental Illness |
|---|-------|-------------------------------|---------------------|------------------|-----------------------|---------------------------|---------------------------|--------------------------|------------------------------|
| 0 | 19516 | 0.768600 | 0.000000 | 0.251588 | IBU_NMUYR | ACE_NMUYR | 5.718385 | MENT_OTH | MENT_ADHD |
| 4 | 2419 | 3.720546 | 0.000000 | 0.418355 | IBU_NMUYR | ACE_NMUYR | 100.000000 | MENT_ANYANX | MENT_PTSD |
| 2 | 1260 | 4.206349 | 0.000000 | 0.361111 | IBU_NMUYR | ACE_NMUYR | 100.000000 | MENT_DEP | MENT_ANYANX |
| 3 | 3034 | 6.855636 | 100.000000 | 0.507910 | IBU_NMUYR | ASP_NMUYR | 15.952538 | MENT_DEP | MENT_ADHD |
| 5 | 1211 | 14.946325 | 100.000000 | 0.701073 | IBU_NMUYR | ACE_NMUYR | 100.000000 | MENT_ANYANX | MENT_DEP |
| 8 | 546 | 20.695971 | 51.648352 | 0.952381 | IBU_NMUYR | ACE_NMUYR | 100.000000 | MENT_ANYANX | MENT_BIP |
| 1 | 571 | 100.000000 | 100.000000 | 2.802102 | HYD_NMUYR | COD_NMUYR | 56.917688 | MENT_ANYANX | MENT_BIP |
| 6 | 557 | 100.000000 | 77.199282 | 6.723519 | ALP_NMUYR | HYD_NMUYR | 77.558348 | MENT_ANYANX | MENT_BIP |
| 7 | 759 | 100.000000 | 0.000000 | 2.816864 | COD_NMUYR | HYD_NMUYR | 32.279315 | MENT_ANYANX | MENT_DEP |

Cluster Analysis - Insights

Some interesting clusters

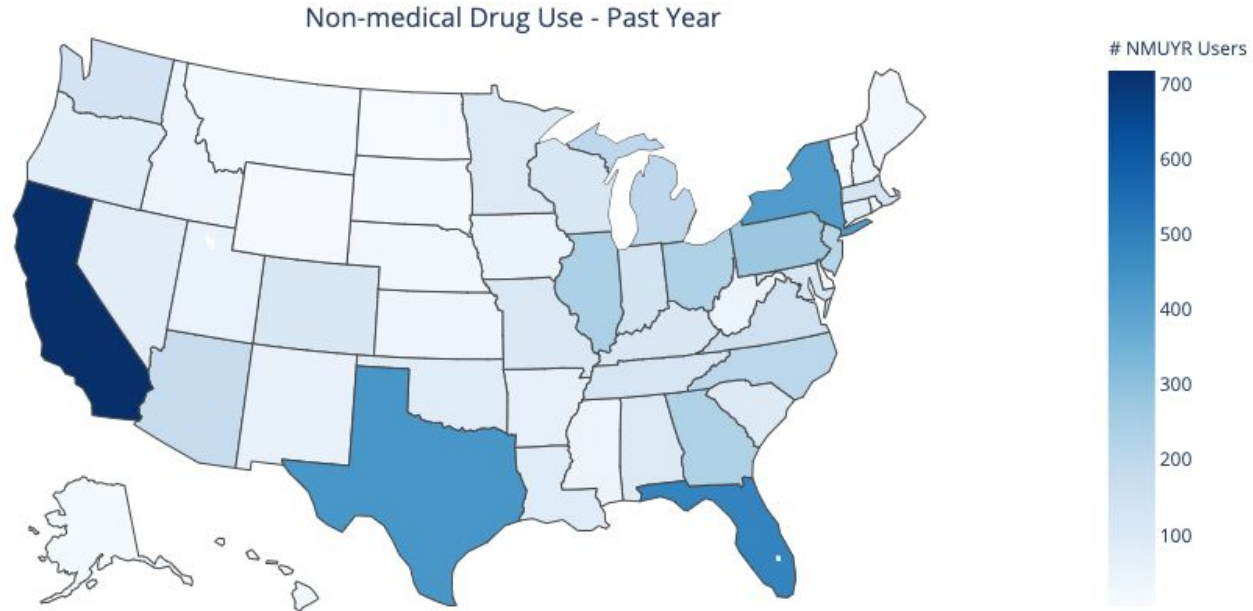
- Cluster index 0 - “Low risk group”
 - Never tried any illicit drug and almost never used drugs for non-medical purposes during last 12 months, only 5 percent have mental conditions
 - Most people in the survey belong to this group
- Cluster index 1
 - 100% have used illicit drug, 100% NMU drugs during last 12 months, most popular non-medical used drug is Hydrocodone (an opioid used to treat severe pain of a prolonged duration) [1]
 - 2nd most seen mental illness condition in the cluster is Bipolar disorder
- Cluster index 6:
 - 77.5% have used illicit drug, 100% used NMU during last 12 months
 - Most used drug is Alprazolam (used in short-term management of anxiety disorders) [1]
 - 2nd most used is Hydrocodone (an opioid used to treat severe pain of a prolonged duration) [1]
 - 2nd most seen mental illness condition is Bipolar disorder

Reference: [1] Wikipedia

Suggestions

- Investigate more the relationship between bipolar disorder and drug misuse, especially those that contain opioids as active ingredient
- Top 10 important features that has strong relationship with drug misuse among demographic and mental attributes, which should be kept if researchers aim to shorten the questionnaire
 - Age (DEM_AGE), general health (DEM_GENHEALTH), education (DEM_EDU), limit of usual activities due to medical conditions (DEM_LIMIT)
 - Bipolar disorder (MENT_BIP), eating disorder (MENT_EAT), anxiety disorders (MENT_ANYANX), PTSD (MENT_PTSD)

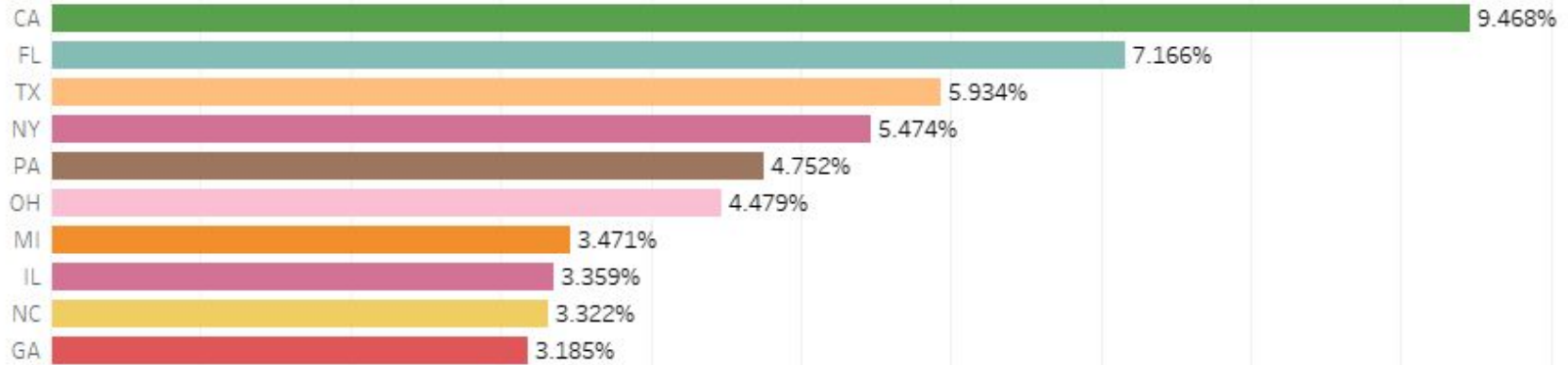
Activity of NMU Drug Use in Past 12 Months



10 States with Highest Proportions of NMU Drugs in The Past 12 months

state 1 States with Highest Proportions of people with mental illness

Dem State





**THANK YOU FOR
LISTENING!**

