CDC: Web Scraping to Assess Medication Safety

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INTRODUCTION

What is the PROTECT Initiative (Preventing Overdoses and Treatment Errors in Children Taskforce)? [1]
- Aims to prevent unintentional medication overdoses in children particularly under 5 years old.
- It also focuses on health concern in the rise in over-the-counter and prescription medication.

In Indiana, cannabis is illegal recreationally
- 10,334 exposures in 2015—2023 (June 30)
- At least 41% of cases 0—12 years old are edibles
- Recent upward trend in Indiana

OBJECTIVES:
- Analyze the reason why children are attracted to cannabis products
- Analyze the trends of cannabinoid exposures in teens

METHODOLOGY

INDIANA POISON CONTROL
- Receive data from Indiana Poison Control Center
- Clean/organize data
  - Substances categorized based on ingredients
  - Therapies categorized based on treatment type
  - Medical effects categorized based on most affected system
- Visualize data
  - Display distributions of therapies and medical effects through matplotlib pie charts
  - Display acuity vs duration through matplotlib stacked bar charts

MARIJUANA SCRAPING
- Collect candy edibles data from major cannabis dispensary (Weedmaps, Grassdoor)
  - Desired output: Product name, Packaging image, Candy type, THC (%, mg), CBD (%, mg)
- Analyze color distribution in packaging. Visualize it as histogram of RGB color code values (0-255)
- Collect 30 – 40 packaging images of children's candy from various brands.
- Compare similarity between packaging of candy edibles and children's candies
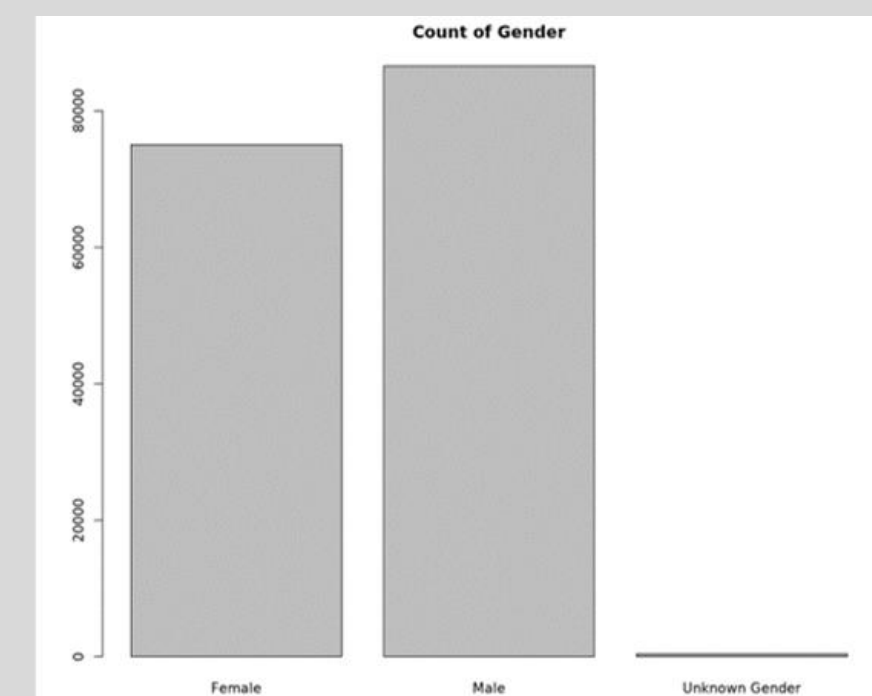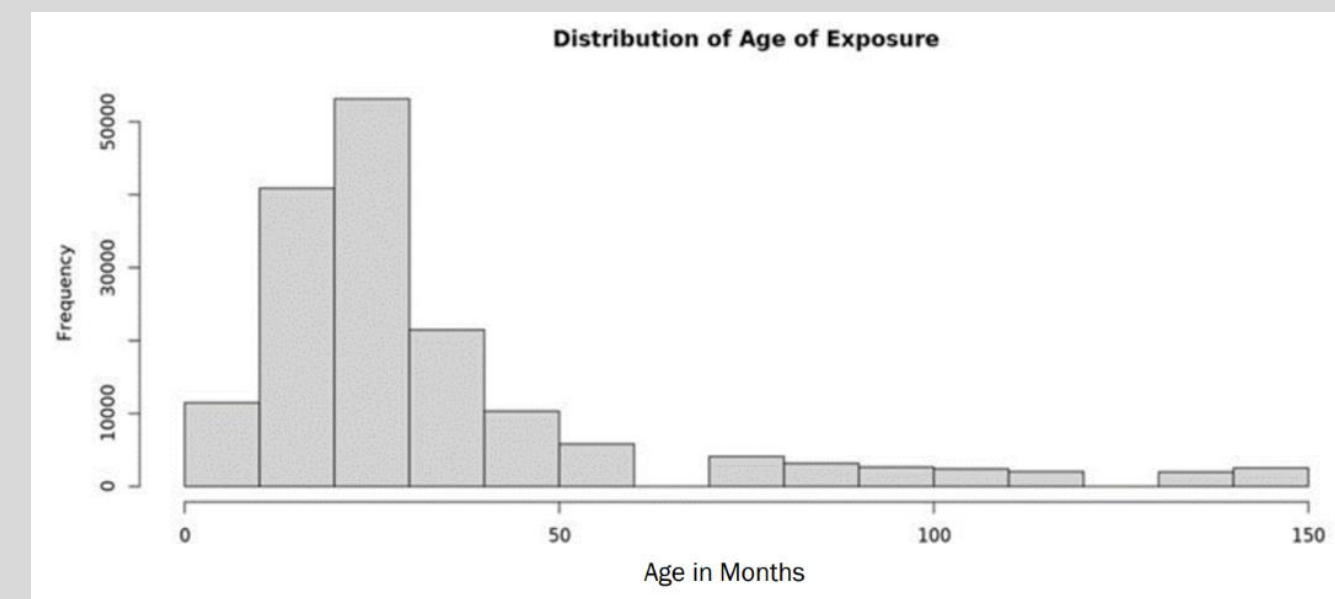
RESULTS: INDIANA POISON CENTER
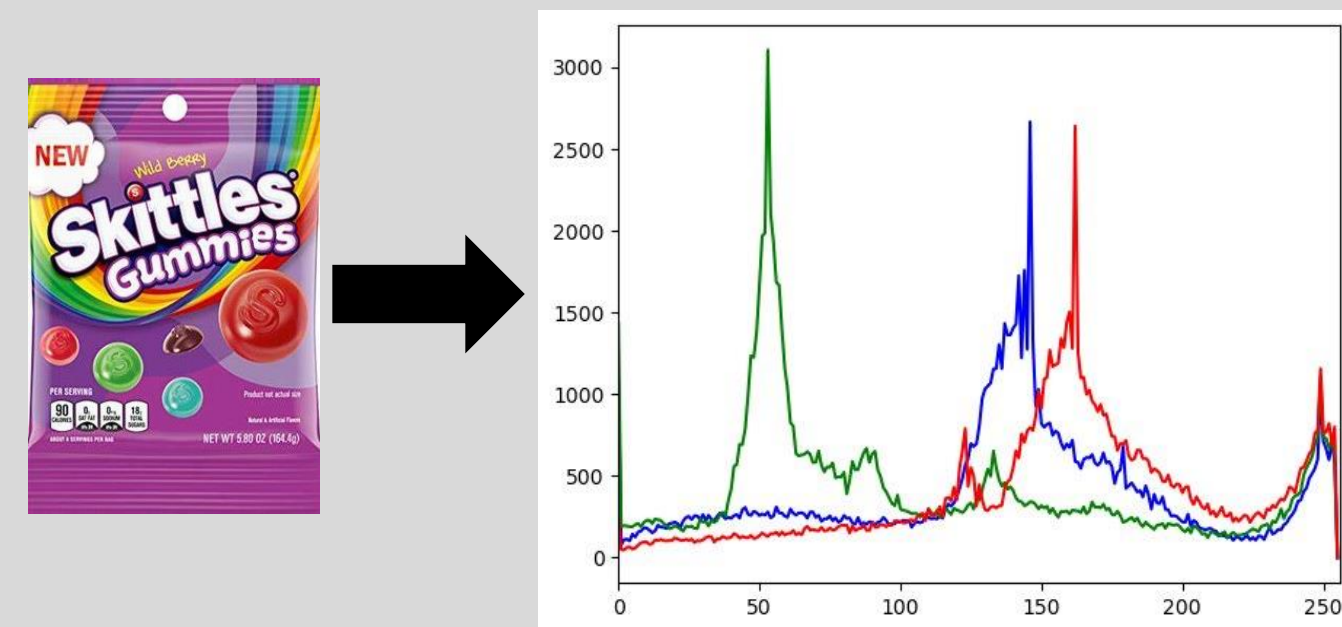
SUMMARY

SYSTEMS AFFECTED:
- The most affected system was the neurological system
- Followed by the cardiovascular system
- And then the GI/Endocrine system

REASONS AND MOTIVES:
- The primary reason behind cases was intentional marijuana abuse
- With unintentional usage in second
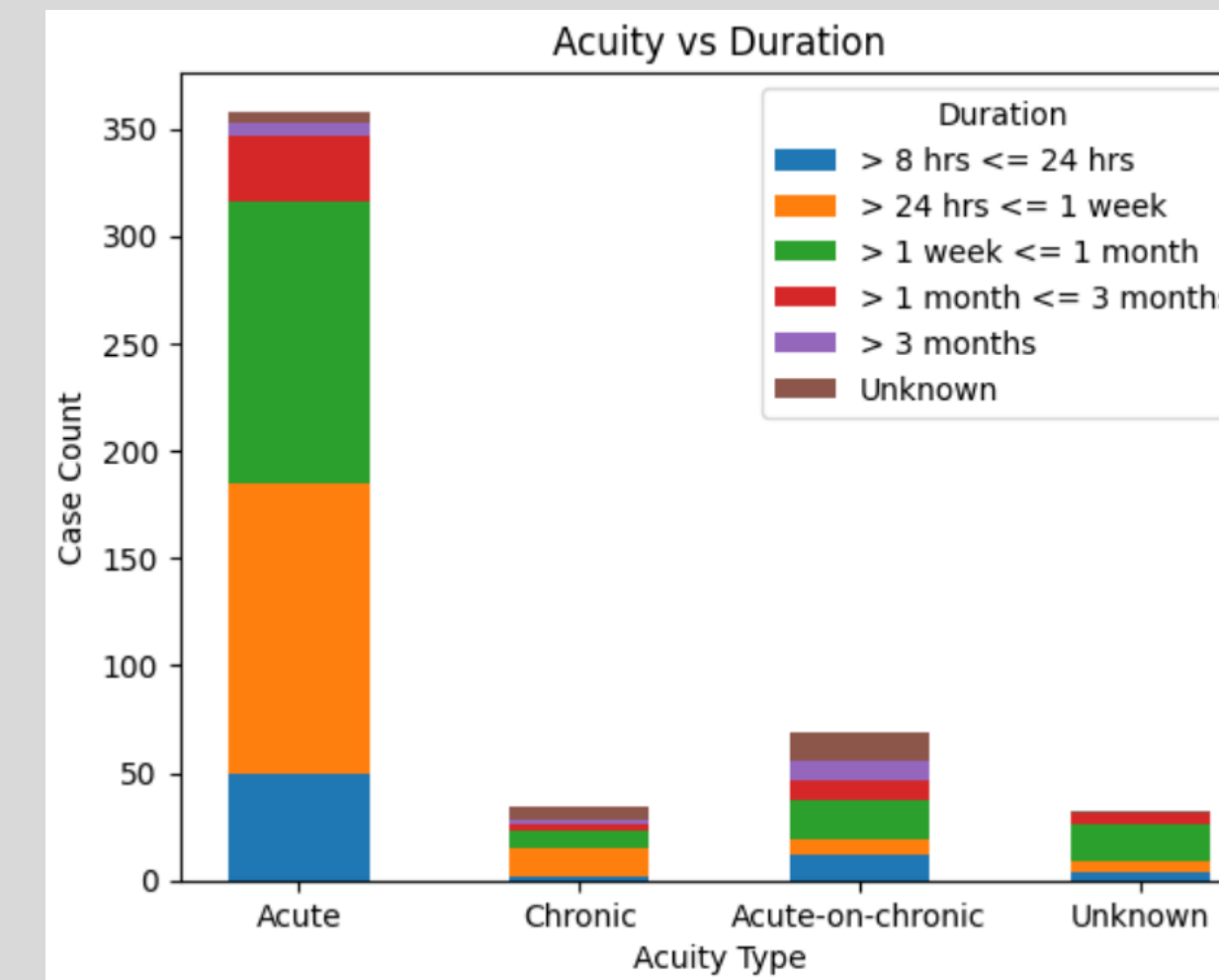- And intentional suicide attempts in third

CASE DEMOGRAPHICS

Distribution of Age of Exposure

Count of Gender

The majority of cases are those under 5 years old

There isn't a significant difference between genders

### ACUITY VS DURATION – MARKED CASES

Acuity vs Duration

Vast majority of cases are acute
Majority of cases have a short duration
Not all cases had an acuity rating – chart shown is a subset of all cases

MAJOR OUTCOME: HEALTH EFFECTS & THERAPIES APPLIED

Medical Outcome - Major Effect - Health Effects
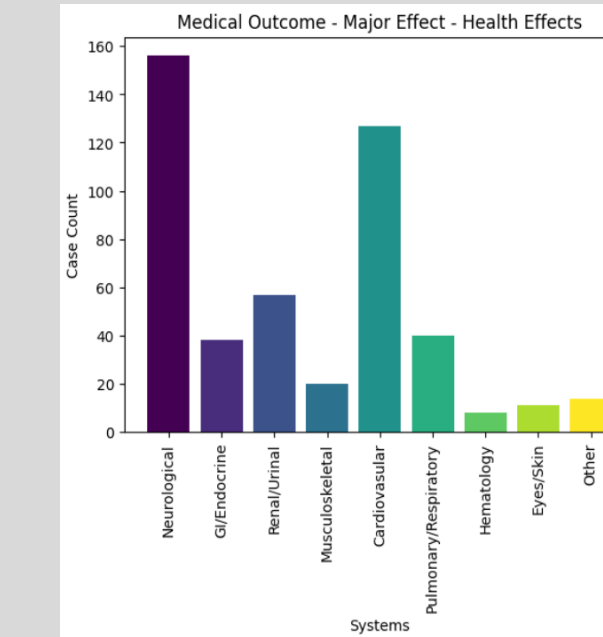
Neurological systems are affected less frequently

GI/endocrine and renal/urinal systems' cases increase

Distribution of Therapies for Medical Outcomes with Major Effect
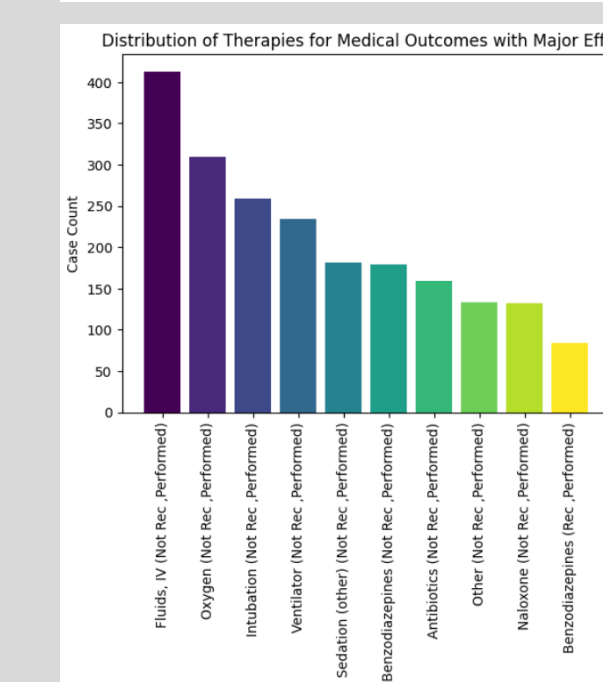
Observation only not an option due to severity

No therapy is recommended

RESULTS: MARIJUANA PACKAGING SIMILARITY
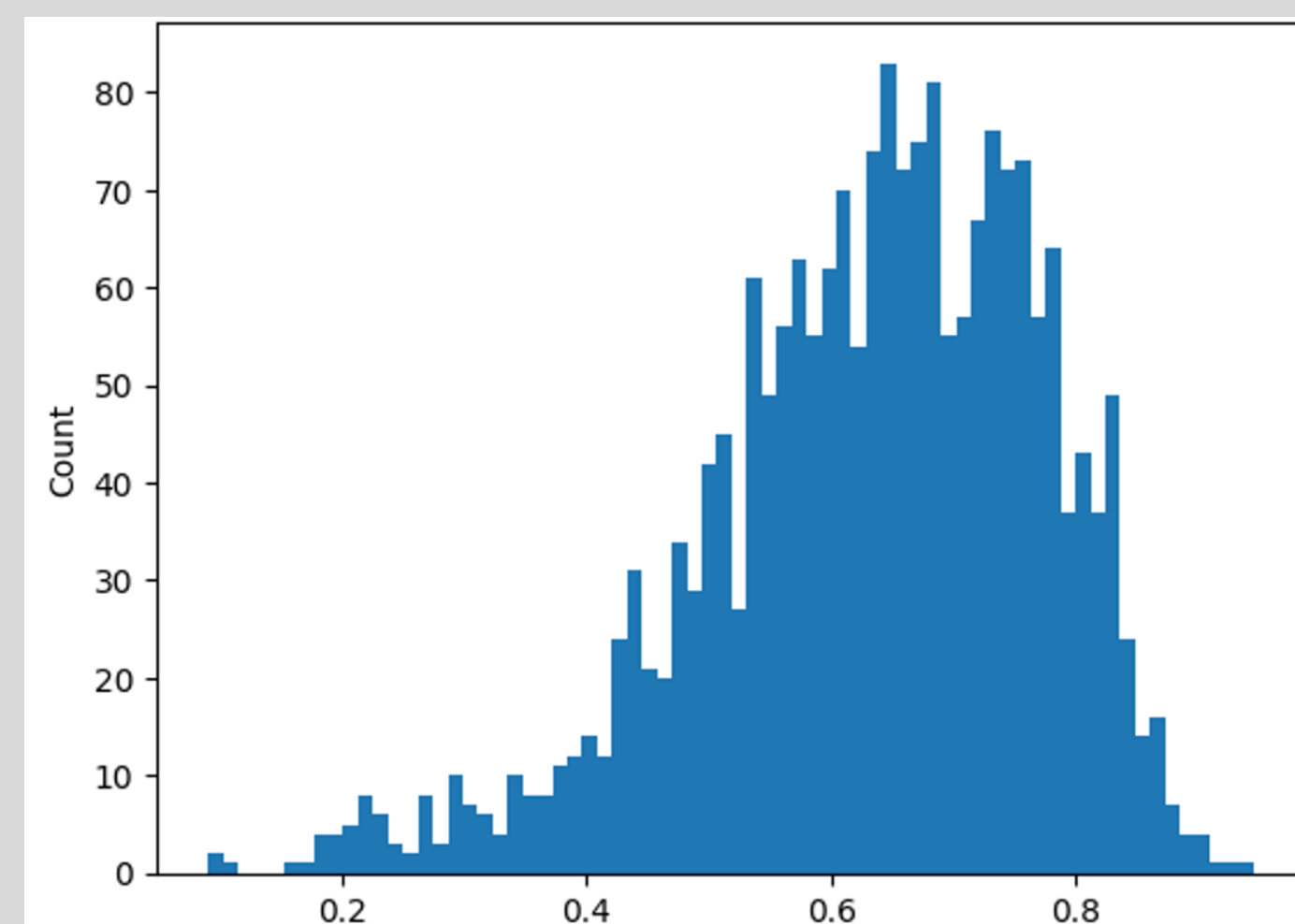
- Approximately 2000 edibles packages compared with 36 sample children candies packages.
- Most candies edibles packages share 60 - 70% color similarity to actual children candy's packages.
- Mean: 0.618   Standard Deviation: 0.146   Median: 0.637 (0 = least similar, 1 = most similar)

- Life Savers Gummies Neon (297) and Snickers (262) share the most similarity with candies edibles packages.
- Candy edibles contain color palettes similar to other gummies and chocolate packages.
- White packages are harder to compare due to difficulties cropping it from the background.

DISCUSSION AND FUTURE GOALS

CANNABIS PRODUCT PACKAGING:
- Colorful packaging has a higher similarity rate with other products, despite differences
- We assumed children find bright colors more appealing than the product's shape or actual color.

CANNABINOID INGESTION DATA FROM INDIANA POISON CENTER:
- Severe overdoses can lead to central nervous system depression, renal failure, and other serious health issues.
- Children's overdoses often result from adult oversight and mental health issues.

FUTURE GOALS
- Create a dashboard of statistical analysis we have performed
- Increase public awareness of substance abuse and policy implications

ACKNOWLEDGEMENTS

REFERENCES

[1] Centers for Disease Control and Prevention. (2023, Mar. 7). *Protect initiative: Advancing Children's medication safety*. Centers for Disease Control and Prevention. https://www.cdc.gov/medicationsafety/protect/protect_initiative.html