Evaluating Accidental Drug and Cardiac Related Deaths

Audrey Pilar, Audrey.Pilar@student.chaminade.edu, Chaminade University of Honolulu

Introduction

There are various types of drugs, which include but are not limited to depressants, narcotics, hallucinogens and stimulants that are prescribed or created synthetically.

- Main factors would for addiction include the environment a person is in or if it is in their genes. (2022)
- The addictive drug classes act on this 3-neuron in-series rain reward neural circuits. This includes, synapses in the Ventral tegmental area or the nucleus accumbens. (Gardner, 2011)
- Five stages of addiction are: First use, continued use, tolerance, dependence and addiction. (Fluyau, et.al., 2024)
- The pathophysiology of addiction had to do with the long-term potentiation (LTP) and long-term depression (LTD). (Fluyau, et.al., 2024)
- "Stimulants including cocaine and methamphetamine can produce damaging cardiovascular effects and initiate and perpetuate various arrhythmias." (Dominic, et.al., 2021)

Hypothesis

A decedent who has taken a stimulant drug will have a cardiac related complication due to stimulant drugs increasing the blood flow in the heart, forcing it to pump faster.

Methods

- R Studio 2023.12.1-402
- Office of the Chief Medical Examiner CT dataset
- Multiple regression analysis
- Line and bar charts

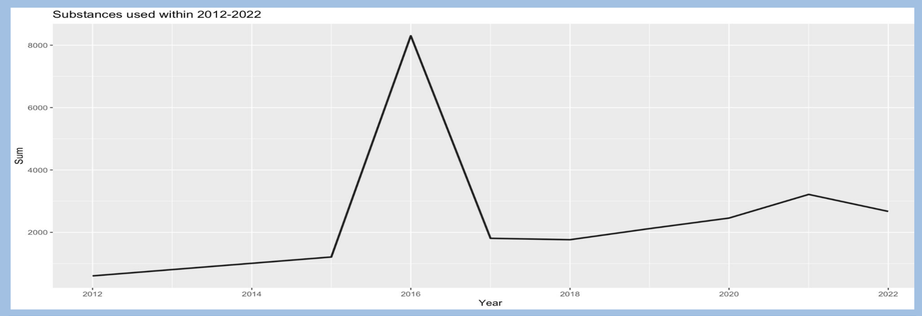

Figure 1: Line graph of overall sum of drugs over the time of 2012-2022

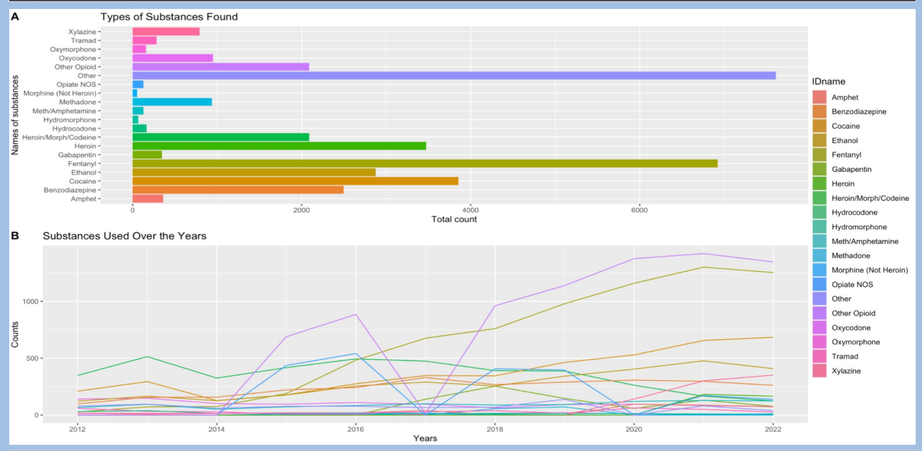

Figure 2: Faceted line and bar graph of overall sum of substances and the trend over the years of 2012-2022

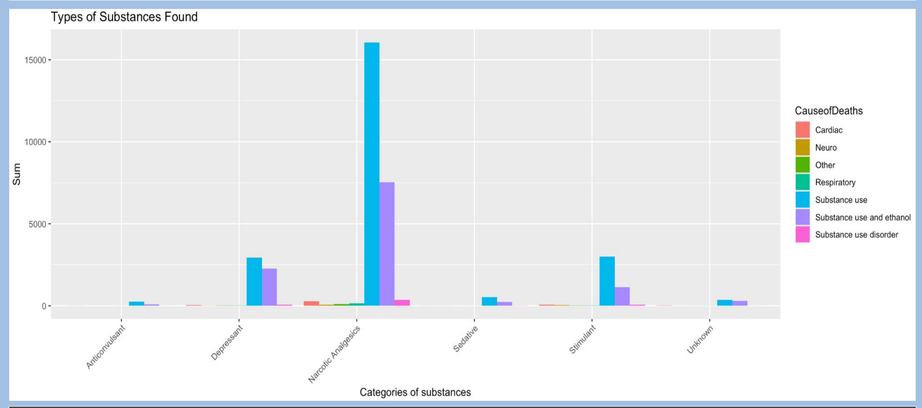

Figure 3: Bar graph of categories of substances and the breakdown of the causes of deaths within each

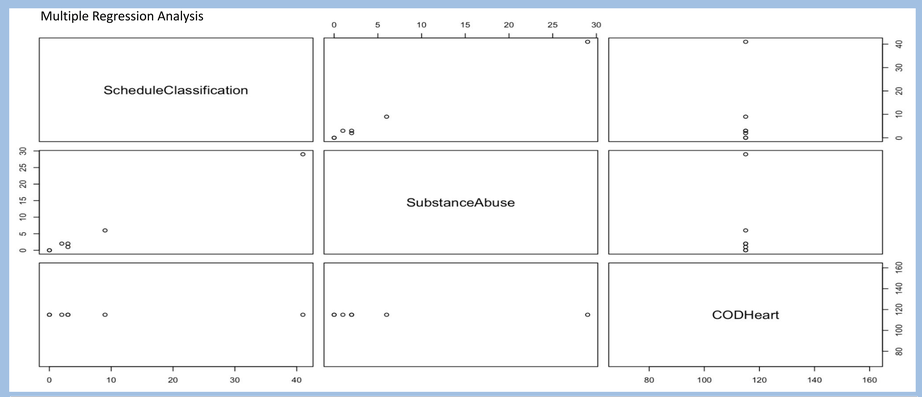

Figure 4: Multiple regression analysis of stimulant substances, substance use disorder and heart related cause of death

Discussion and Results

The hypothesis was not supported, and decedents who take stimulant drugs is not more likely to experience a cardiac related death.

- Null hypothesis: Stimulant drugs and substance abuse are not likely to influence heart related deaths
- P-value: 0.4606
  - Schedule classification: 0.719
  - Substance abuse: 0.720

Limitations

There were multiple limitations within this dataset, that may have either restricted or prevented a full analysis of the data.

- Classification system of the substances
- Consistency of the wording and formatting of the cause of deaths and diagnosis
- Other drugs were listed and there is a possibility not every drug was listed

Future Works

In the future, this research will serve as a basis for other datasets from other states or counties. In addition, to study additional variables such as the manner of death. This dataset was only accidental deaths, which are those who did not intend to pass away from drug use.

Acknowledgements

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