

Introduction

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3/2/2021

1 Introduction

1.1 Background

In 2018 alone, almost 70 thousand deaths occurred in the United States due to drug overdoses; in the same year, almost 70 percent of these overdoses occurred due to opioid drugs [1]. While the use of drugs itself is not a new phenomenon, compared to the start of the twenty first century, yearly drug-related deaths in the US have increased nearly four-fold [2]. Experts in the field relate this increase to the increased use and abuse of the previously mentioned opioid-class drugs. In this time period, opioid drugs gained popularity in the medical field as they are incredibly effective at relieving physical pain, however, they also have a large propensity for addiction [3]. Unfortunately, opioid drugs can also be deadly when taken above their prescribed level as well as when combined with other substances.

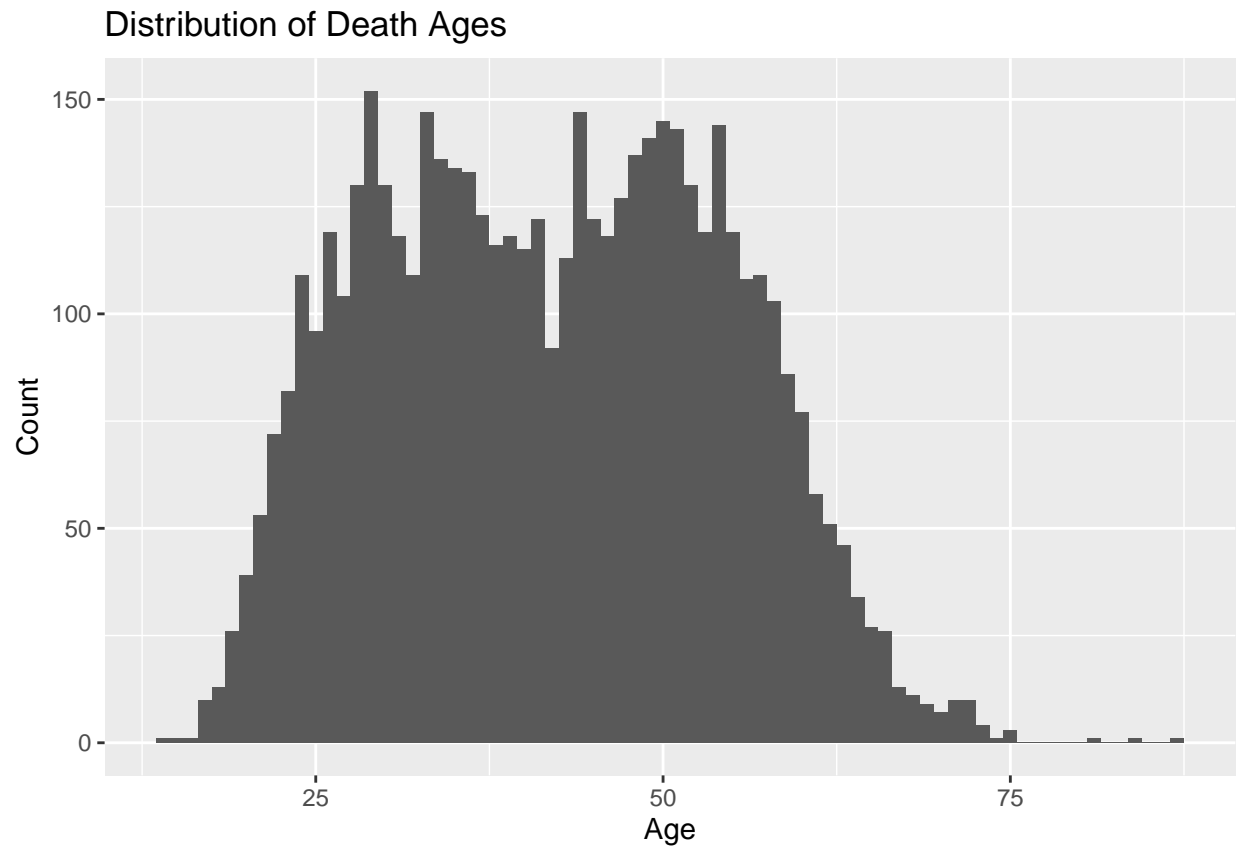
1.2 Data

The data available contains over 5000 drug-related deaths that occurred in the State of Connecticut from 2012 to 2018. It contains several demographic variables about the deceased as well as the location and cause of death and drugs found in the system at death. It was obtained from coroner's reports and publicly accessed death certificates [4]. The data contains several binary variables indicating drugs present at death, however, many of these drugs (Heroin, Fentanyl, Oxycodone, Oxymorphone, Hydrocodone, Methadone, Tramadol, Morphine, and Hydromorphone) are of the opiate classification and thus in order to reduce confounding between these drugs a single opiate variable was created. Although one already exists in the data, it does not match up with what occurs including all of these drugs, and thus, the manually created one is preferable.

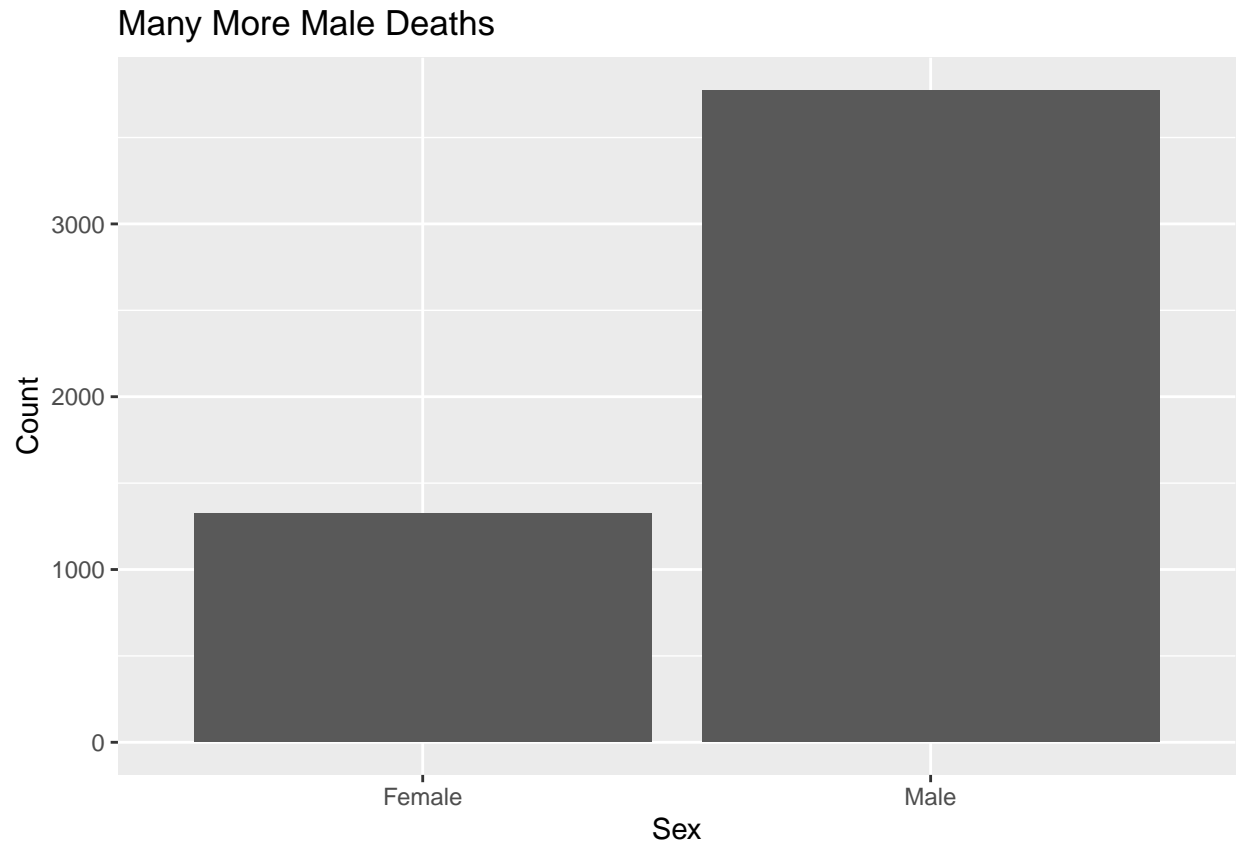
1.3 Goals of Analysis

The following analysis seeks to analyze the count data of drug-related deaths in Connecticut from 2012 to 2018 compared to the other drugs and circumstances that existed at the time of death given. The overall goal is to deduce what concurrent factors with opioid use lead to increased death counts due to drug use.

Exploratory Data Analysis

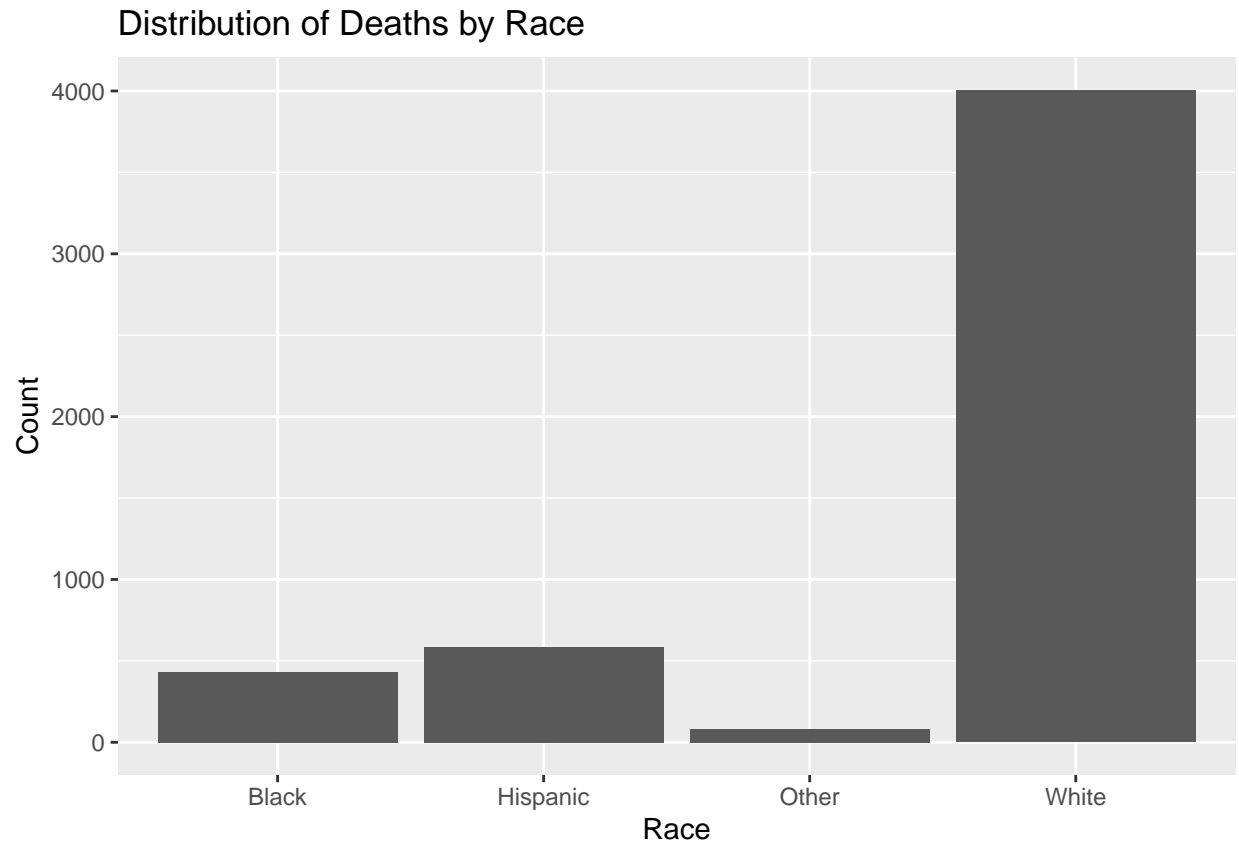


By observing the distribution of ages of death due to drugs, it seems that the distribution is bimodal. There appears to be one peak around individuals in their late 20s and another in their 50s indicating two major groups experiencing death due to drugs.

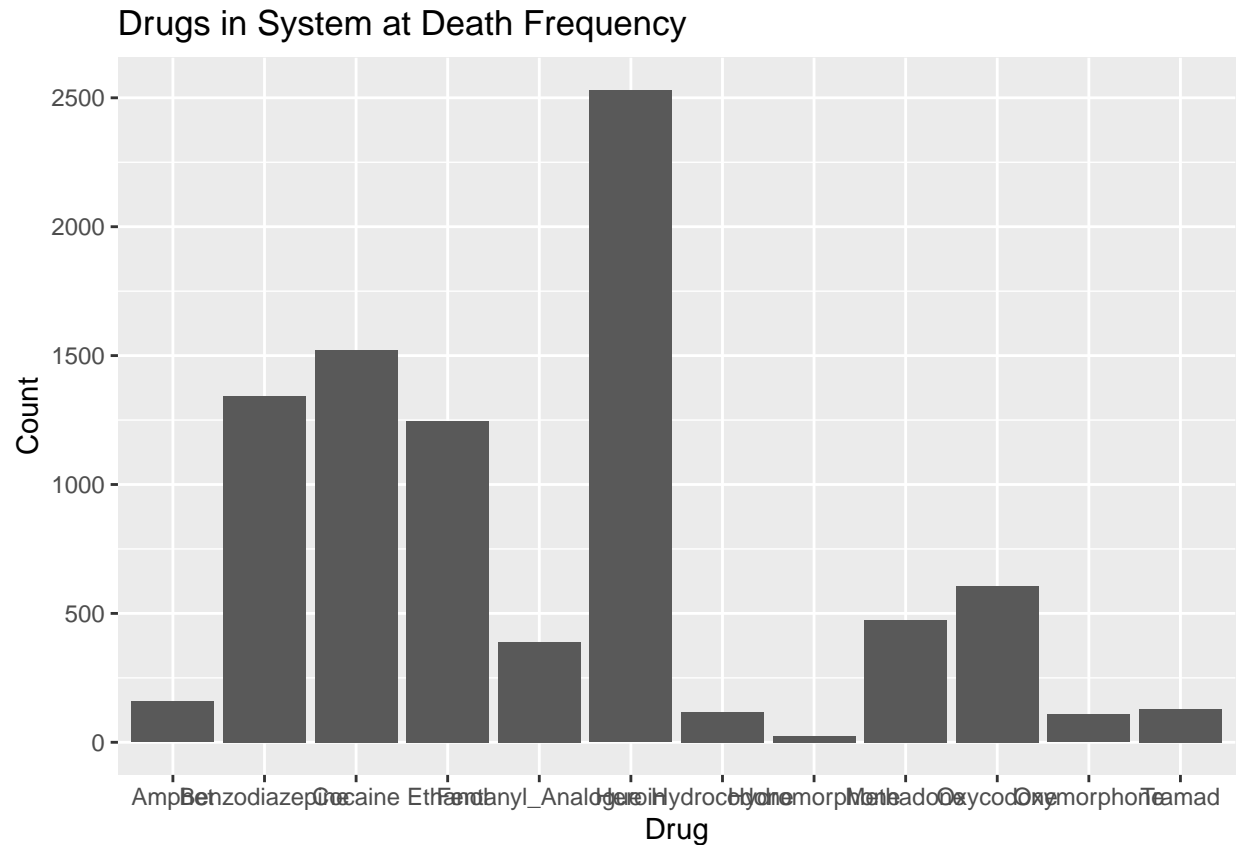


It appears that significantly many more men are present in the drug deaths dataset than women.

```
## # A tibble: 12 x 2
## # Groups:   Race [12]
##   Race          n
##   <chr>        <int>
## 1 Asian Indian    14
## 2 Asian, Other    18
## 3 Black          433
## 4 Chinese         2
## 5 Hawaiian        1
## 6 Hispanic, Black  24
## 7 Hispanic, White 561
## 8 Native American, Other 1
## 9 Other          11
## 10 Unknown        23
## 11 White         4004
## 12 <NA>           13
```



It is seen that there are many more white individuals included in the drug related deaths dataset. However, this dataset comes from Conneticut and it may be important to view this as a proportion of the actual population of the State as White people make up a much larger portion of the state.



Unsurprisingly, it is observed that the vast majority of drug deaths are observed to have Heroin in the system at the time of death. Because cocaine, ethanol, and benzodiazepines are non-opiate drugs often also observed at time of death, it may be worthwhile to look into these as well.

References

- [1] [cdc.gov/drugoverdose/data/statedeaths.html](https://www.cdc.gov/drugoverdose/data/statedeaths.html)
- [2] <https://www.drugabuse.gov/drug-topics/trends-statistics/overdose-death-rates>
- [3] [cdc.gov/drugoverdose/data/statedeaths/drug-overdose-death-rate-increase-map-2017-2018.html](https://www.cdc.gov/drugoverdose/data/statedeaths/drug-overdose-death-rate-increase-map-2017-2018.html)
- [4] <https://www.kaggle.com/ruchi798/drug-overdose-deaths>