The opioid epidemic in surveillance & survey data

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Introduction

- The opioid epidemic has resulted in increased deaths across the USA. Last year alone, 100K individuals died from overdoses.[1]

- Legal measures have been enacted to crack down on pill mills and prevent overdoses. But illicit opioids still contribute toward ODs. Fentanyl-spiked drugs have also contributed towards increased mortality.

1. *Drug Overdose Deaths in the U.S. Top 100,000 Annually*. (2021, November 17). https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2021/20211117.htm

Questions to be Asked

1. Are individuals still obtaining opioids via their providers? Or are they obtained on the black market?

2. How does surveillance data (containing hospital logs and admissions) compare with self-reported survey data?

To answer this question, we can compare both sources of data and their populations. We'll be focusing on the age distribution.

Data Sources

1. **National Health and Nutrition Examination Survey (NHANES):** administered on a national level via the CDC. Contains information on prescription drugs + multiple health outcome

2. **Statewide Planning and Research Cooperative System (SPARCS):** contains surveillance data on inpatient hospitalizations in New York State

(Both datasets were subsetted for 2016 data)

NHANES

- Obtained via .CSV files (and joined). One-to-many relationships
- Key tables used are **demographics** and prescriptions
- Patients restricted to those prescribed oxycodone or fentanyl
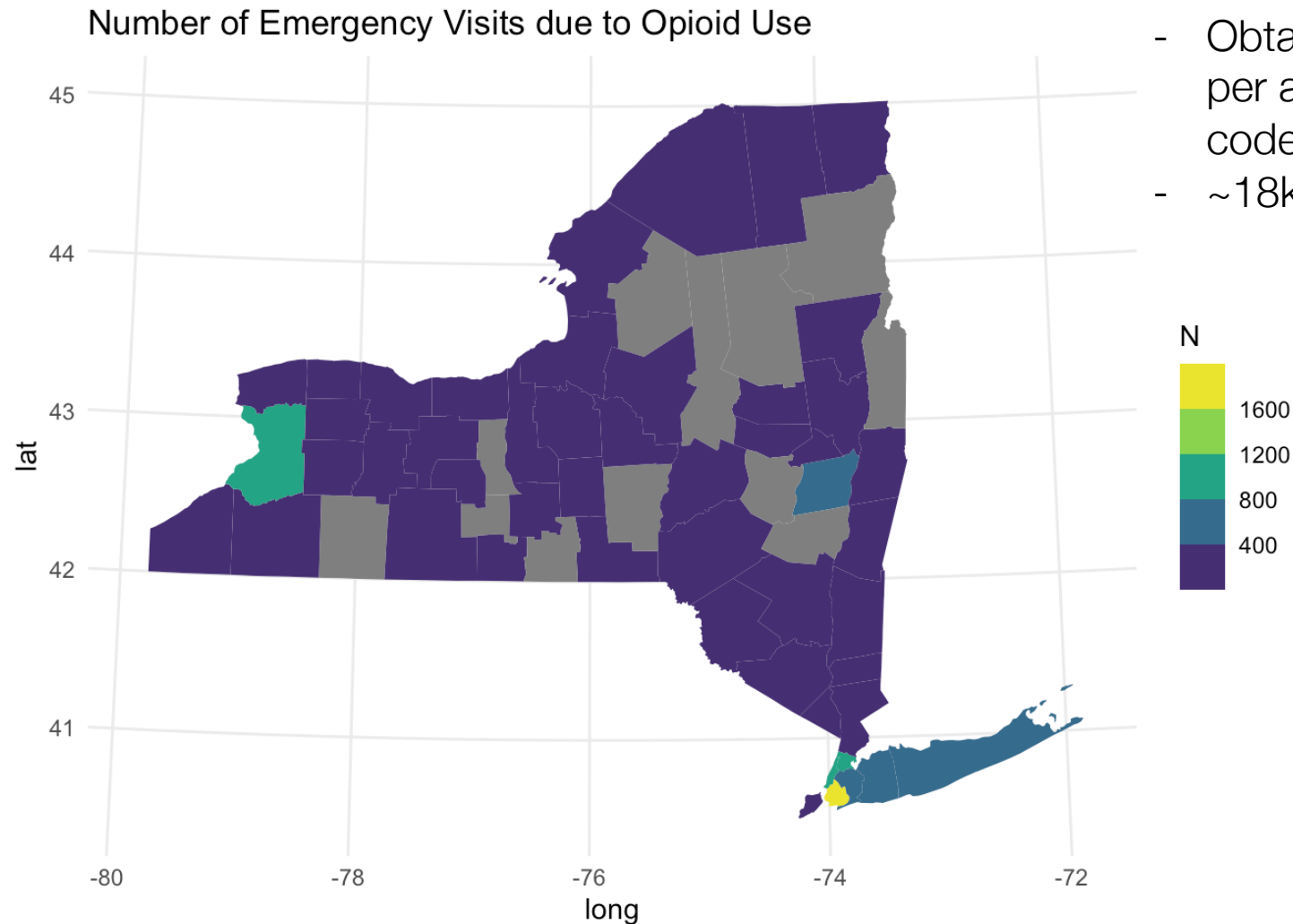- Totaled to 72 patients

NHANES: Statistical Check

```
## ## Shapiro-Wilk normality test ## ## data:
dt.demo.NHANES.sub$RIDAGEYR ## W = 0.95444, p-
value = 0.0154
```

Interpretation: ages in NHANES are not normally distributed.
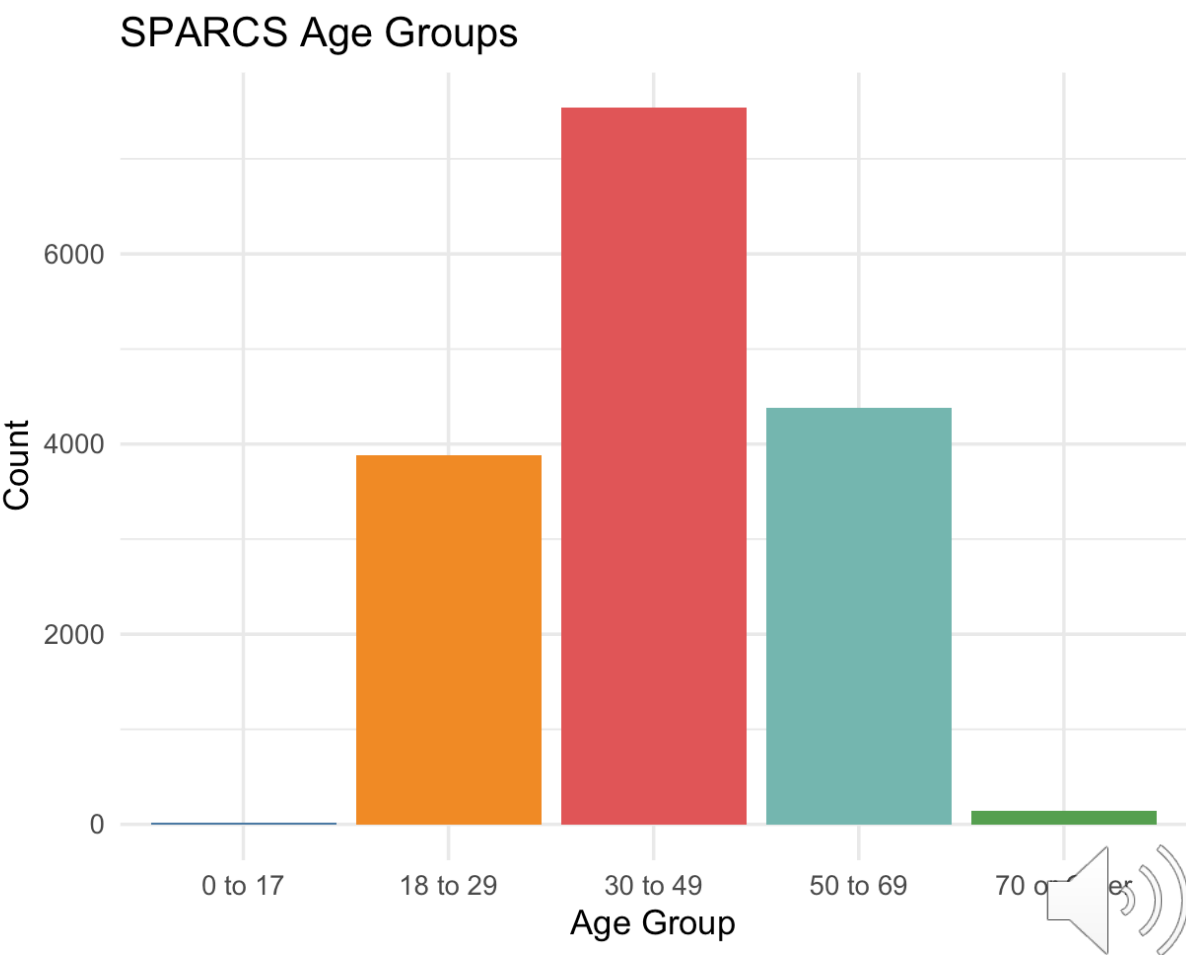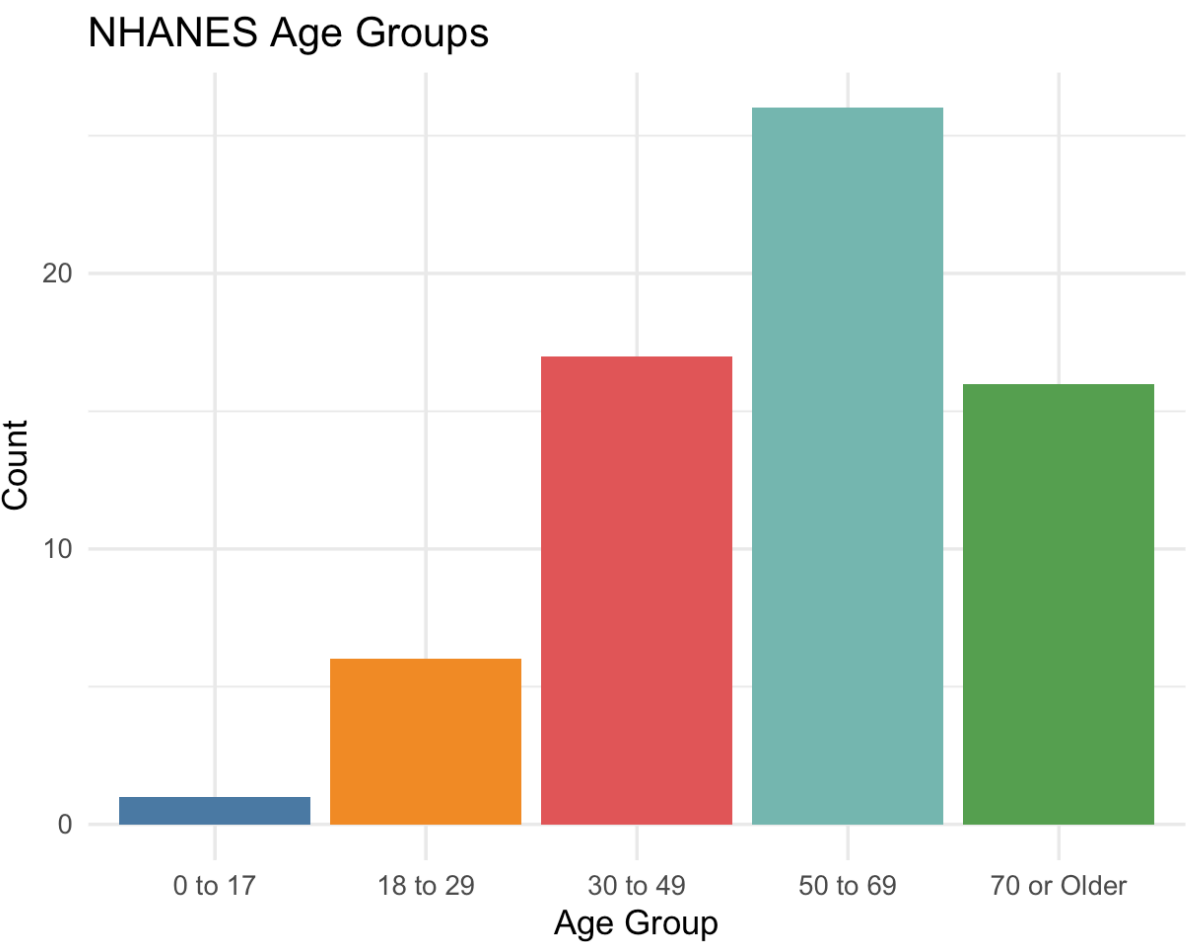
SPARCS: Exploratory Data Analysis

Number of Emergency Visits due to Opioid Use

- Obtained via API & subsetted per an opioid-use disorder code
- ~18k cases

Age Distributions: NHANES vs SPARCS

Age Distributions: NHANES vs SPARCS

```
## ## Pearson's Chi-squared test ## ## data: dt.cont.tbl$age_group and
dt.cont.tbl$Data ## X-squared = 414.5, df = 4, p-value < 2.2e-16
```

Interpretation: the age distributions in NHANES differs from SPARCS. Based on previous visualizations, SPARCS hospitalizations consist of disproportionately younger individuals compared to older ones in NHANES.

Key Takeaways

1. Individuals who are prescribed opioids tend to be older compared to folks who are hospitalized for overdosing. This suggests at illicit drug use or potential gaps in patient/provider relationships.
2. New York State overdose counts skew toward downstate but notable counties in upstate also have an increased case burden.
3. Future analyses could include longitudinal visualizations on a per-county basis and examining specific drivers and risk factors toward overdosing.