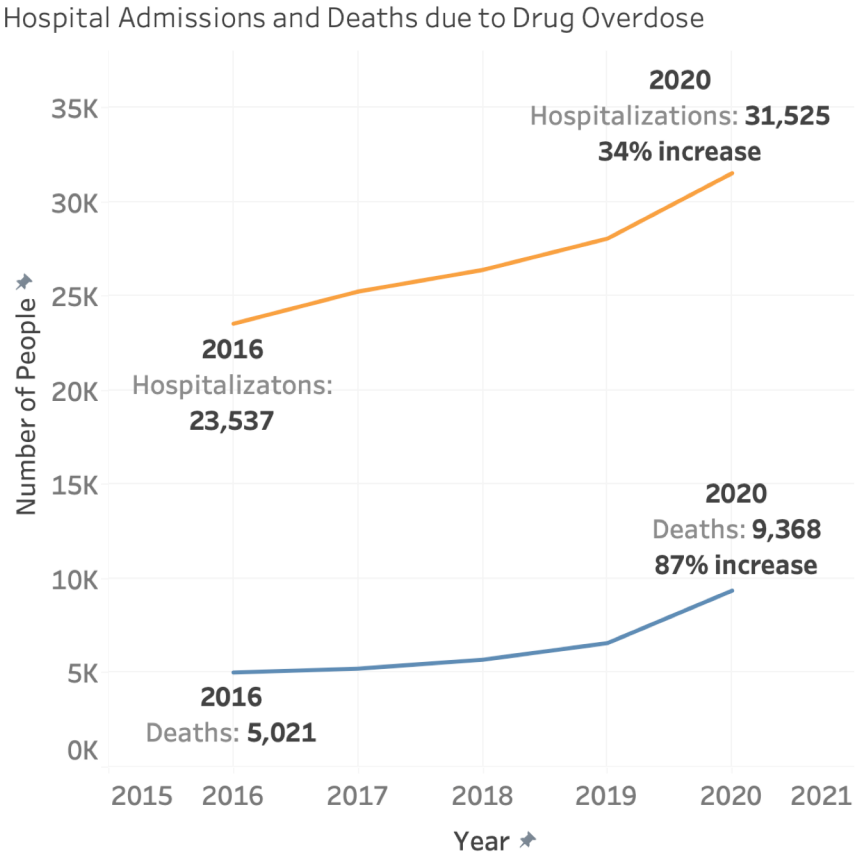
Tackling California's Drug Overdose Problem

EDA and Business Proposal to the CDPH

Drug overdose cases are on the rise...

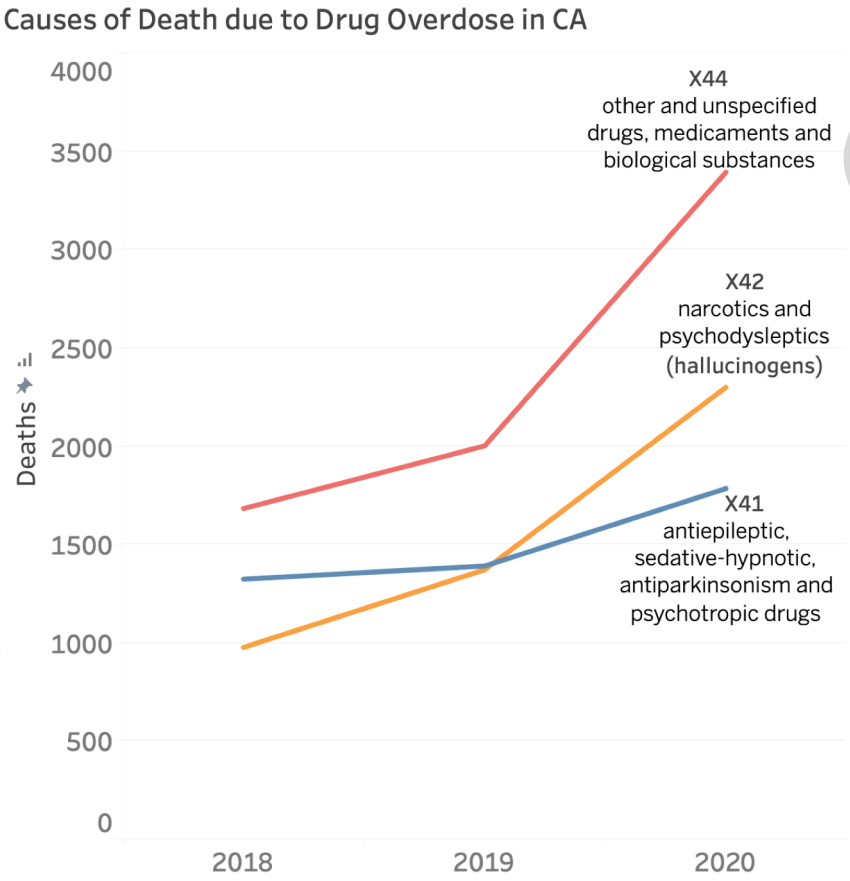


Since 2016, overdose:

Hospital Admission are up 34%

Deaths are up 87%

Drug overdoses are hard to categorize

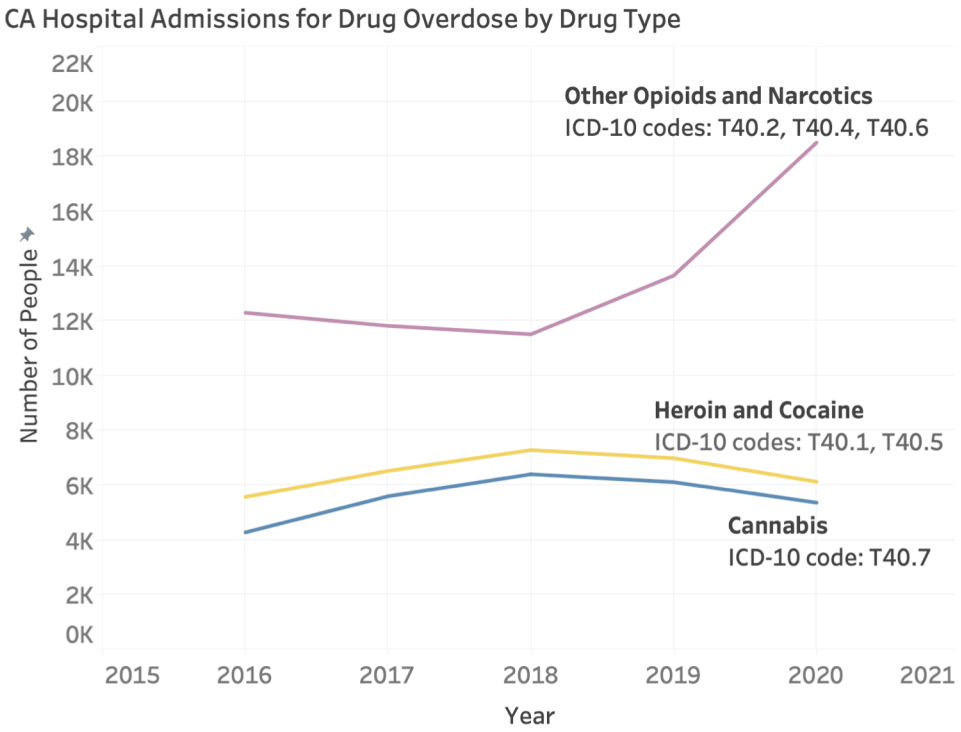


Overdoses often involve multiple drug combinations

In approximately 1 in 5 drug overdose deaths, no specific drug is listed on death certificates.

Some synthetic opioids do not yet have designated ICD-10 codes

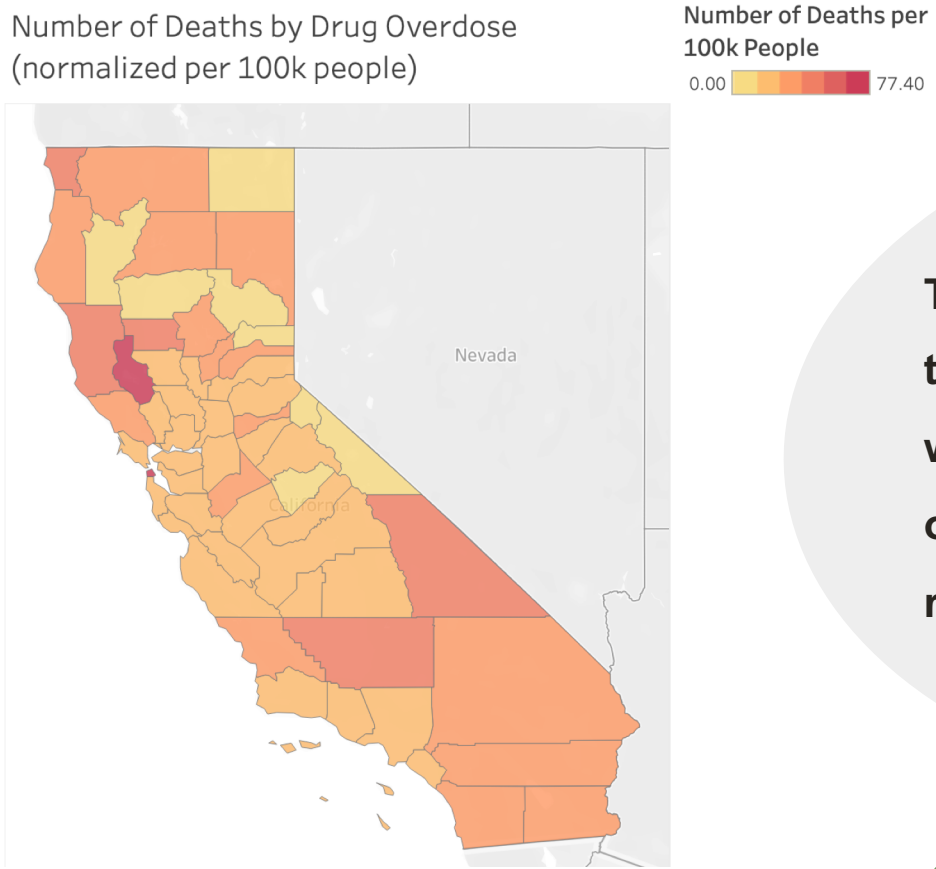
Many OD cases are now linked to prescription medications



Heroin and Cocaine overdoses have stabilized

Overdoses from other opioids and narcotics are rising (including those from prescription medications and fentanyl)

Problem:



The CDPH needs a way to quickly determine who needs education and outreach in order to curb the rapid increase in OD cases

SOLUTION

- Build a **Linear Regression Model** that will predict the number of people likely to die from overdose given a set of demographics and current Schedule II-V prescribing practices
- Using known data about prescribing practices and demographics, **predict the number of deaths due to drug overdose in 2022 at the zip code level**

IMPACT

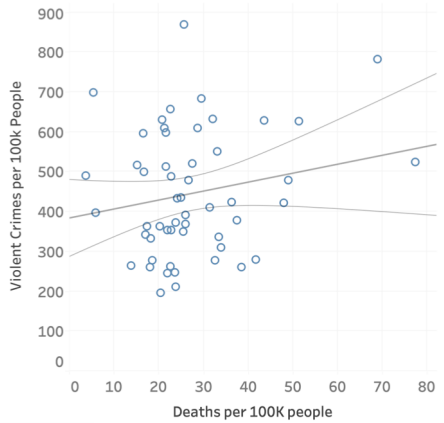
- A clear identification of zip codes that are in need of immediate assistance will allow the CDPH to effectively reduce the number of drug overdoses
- This analysis will also provide the CDPH a means to identify what populations are most at risk for drug OD

MEASURE OF SUCCESS: a decrease in the number of hospitalizations and deaths caused by drug overdose, which will:

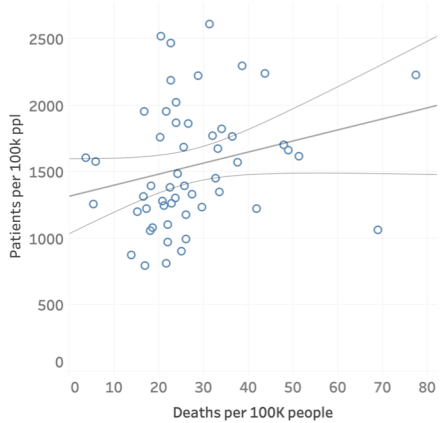
- Benefit the people struggling with drug abuse and their communities
- Decrease the burden on hospitals and ERs

Initial Scatterplot Analysis

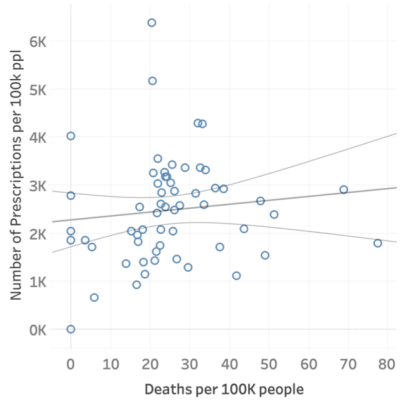
Violent Crimes vs. Overdose Deaths Per County



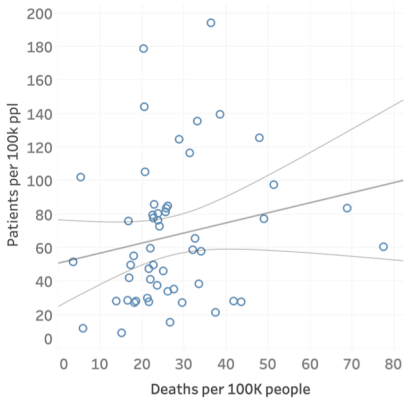
Number of Patients with Same Prescription Drug from 3 or More Prescribers



Number of Prescriptions for Schedules II, III, and IV Drugs (patien
prescriptions from all three schedules)



Number of Patients Who Are Currently Prescribed More than 40 Milligrams
Methadone Daily



Comparator	Pearson Correlation
Number of Prescriptions for Schedule II Drugs	0.195
Number of Prescriptions for Schedules II, III, and IV Drugs (patient receives prescriptions from all three schedules)	0.113
Number of Patients with Same Prescription Drug from 3 or More Prescribers	0.246
Number of Patients Currently Prescribed More than 100 Morphine Milligram Equivalency Per Day	0.271
Number of Patients Who Are Currently Prescribed More than 40 Milligrams Methadone Daily	0.195
Number of Patients Prescribed Both Opioids and Benzodiazepine in Prescriber's Locale	0.165
Violent Crimes	0.196
Property Crimes	0.252
Unemployment Rate	0.173
Race – Percent White	0.381
Race – Percent Black	0.420

FUTURE GOALS

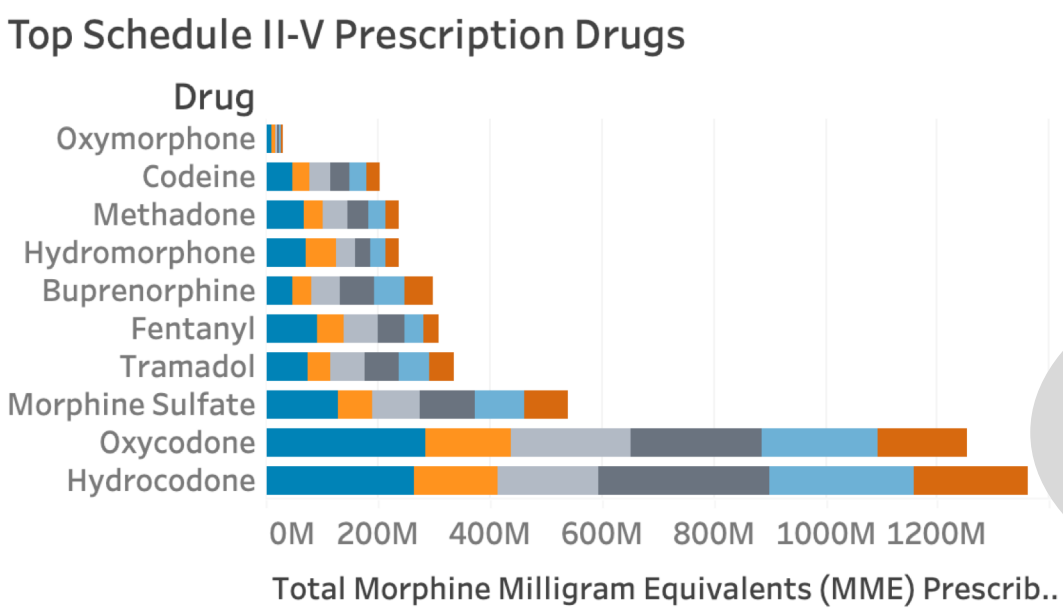
- Look into the **number of hospitalizations** as a target variable (need additional data broken down to the county / zip level)
- Take a look at other mental health related metrics to explore WHY people turn to drug abuse instead of using healthier alternatives

All Tableau visuals accessible through this QR code

PPT template courtesy of SlidesGo

Thank you!

Appendix



Most of the top Schedule II-V prescription drugs are in the "highest potential for abuse" category

Most of these drugs are Schedule II (high potential for abuse), except:
Buprenorphine: Schedule III
Tramadol: Schedule IV