The opioid epidemic: socioeconomic factors and opioid prescription rates

Team Opi-nope (Team 3):
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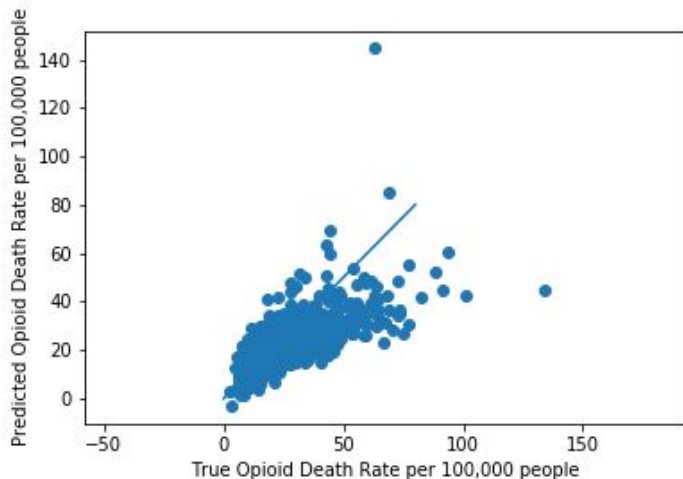# We learned about policies addressing the epidemic...

- Spoke with a pharmacist who had worked in three states (IA, WI, WA)

- Tackling the opioid crisis on the prescription side
  - Day limits on first opioid prescription
  - Requiring prescription pre-approval from insurance companies
  - Mandating electronic prescriptions and reporting

- Which socioeconomic factors are most relevant for opioid overdose deaths?

- Are these policies limiting opioid prescriptions correlated with deaths due to opioid overdose?

Data wrangling

- County Health Rankings (CHR)
- US census data
- Rate of opioid prescriptions (CDC WONDER)
- Drug overdose deaths from CDC WONDER (to fill in missing values from CHR)

- Years 2015 and 2016
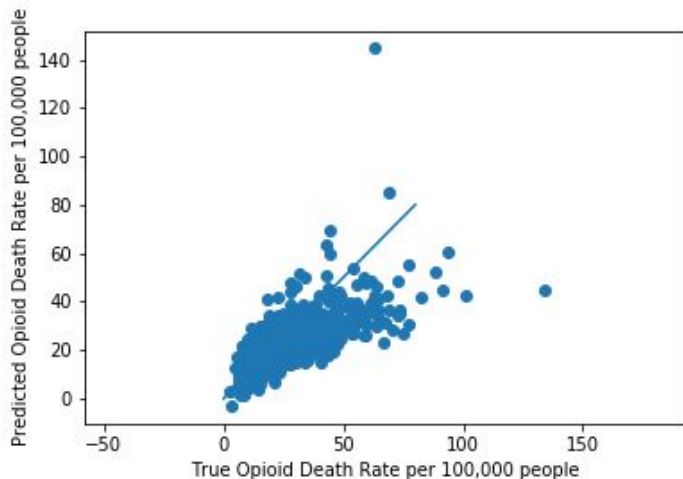- All data was normalized by population

Our model performance

- Feature exploration with scatter plots
- Can we predict one year's data with another year's?
- Linear regression with L1 regularization (LASSO)
  - Model with training data from 2015 and test data from 2016 : r^2 = 0.4225
  - Baseline model with random 50/50 training/test split: r^2 = 0.5169

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Clemans-Pope et al. 2018
r^2 = 0.4046

Strongest predictors in our linear model
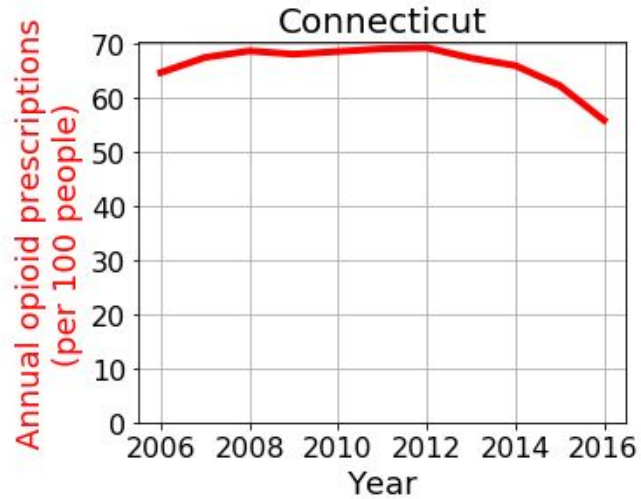
Large positive coefficients
- Housing
  - Age of housing complex
  - Size of housing complex
  - Having a mortgage
  - Air pollution
- Personal health
  - Insufficient sleep
  - Disability status
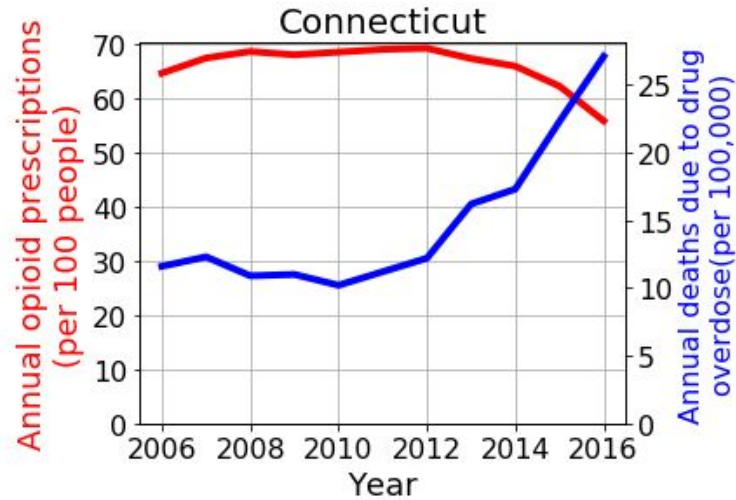- Race (non-Hispanic white)

Large negative coefficients
- Employment status
- Years of residency in the US
- Nationality
- College education
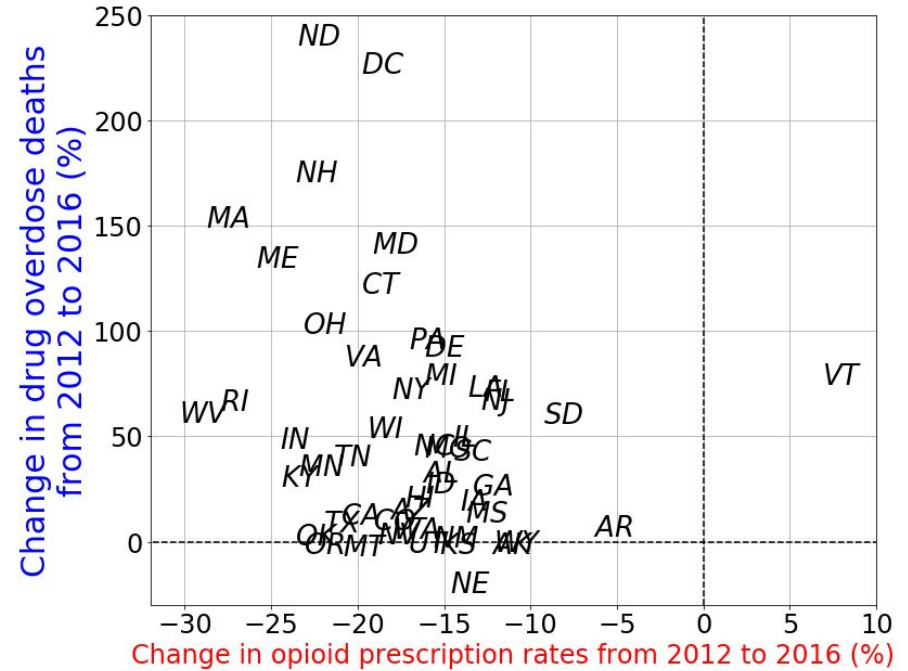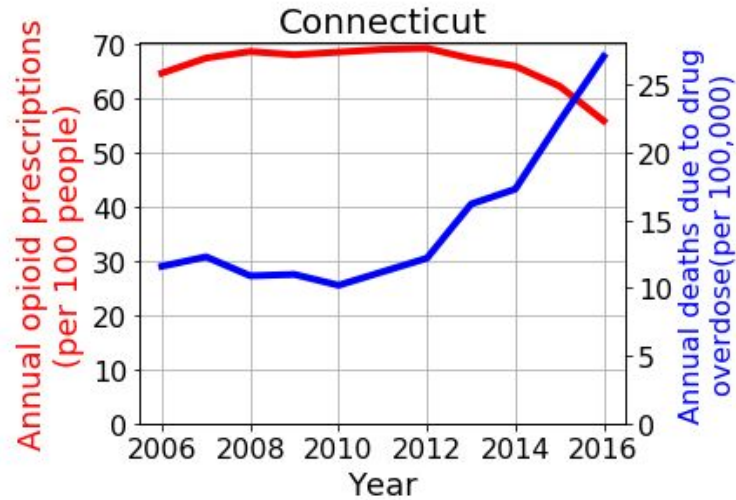- Enrollment in Kindergarten

Fewer prescriptions not associated with fewer overdose deaths

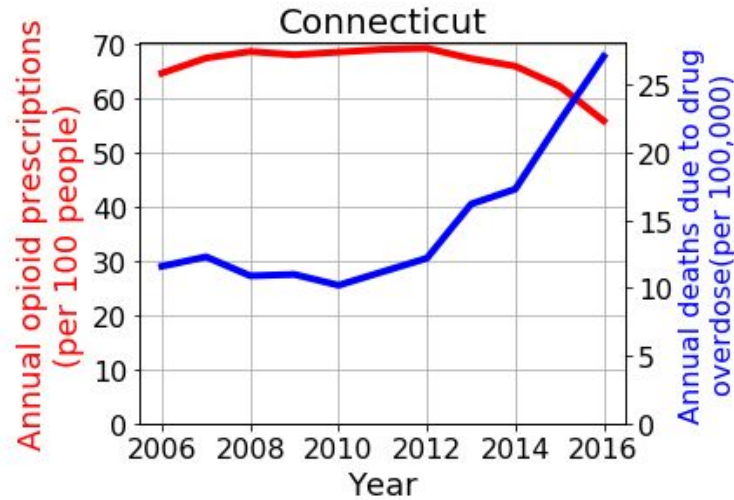# Fewer prescriptions not associated with fewer overdose deaths

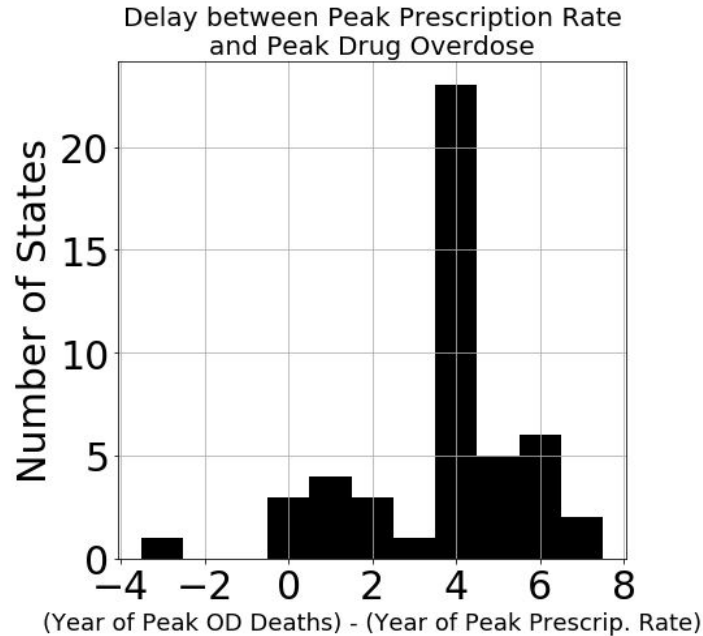# Fewer prescriptions not associated with fewer overdose deaths

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Possible explanations:

- Can't get opioid prescription, turn to illicit fentanyl / heroin
- Restricting prescriptions ineffective; need other approaches
- Takes time for decrease in prescriptions to have effect on overdose deaths

Fewer prescriptions not associated with fewer overdose deaths

Delay between Peak Prescription Rate and Peak Drug Overdose

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