THE OPIOID EPIDEMIC

Estimate the Impact of Opioid Regulations in the United States

IDS 720 Mid-Semester Project

Team Red ❤
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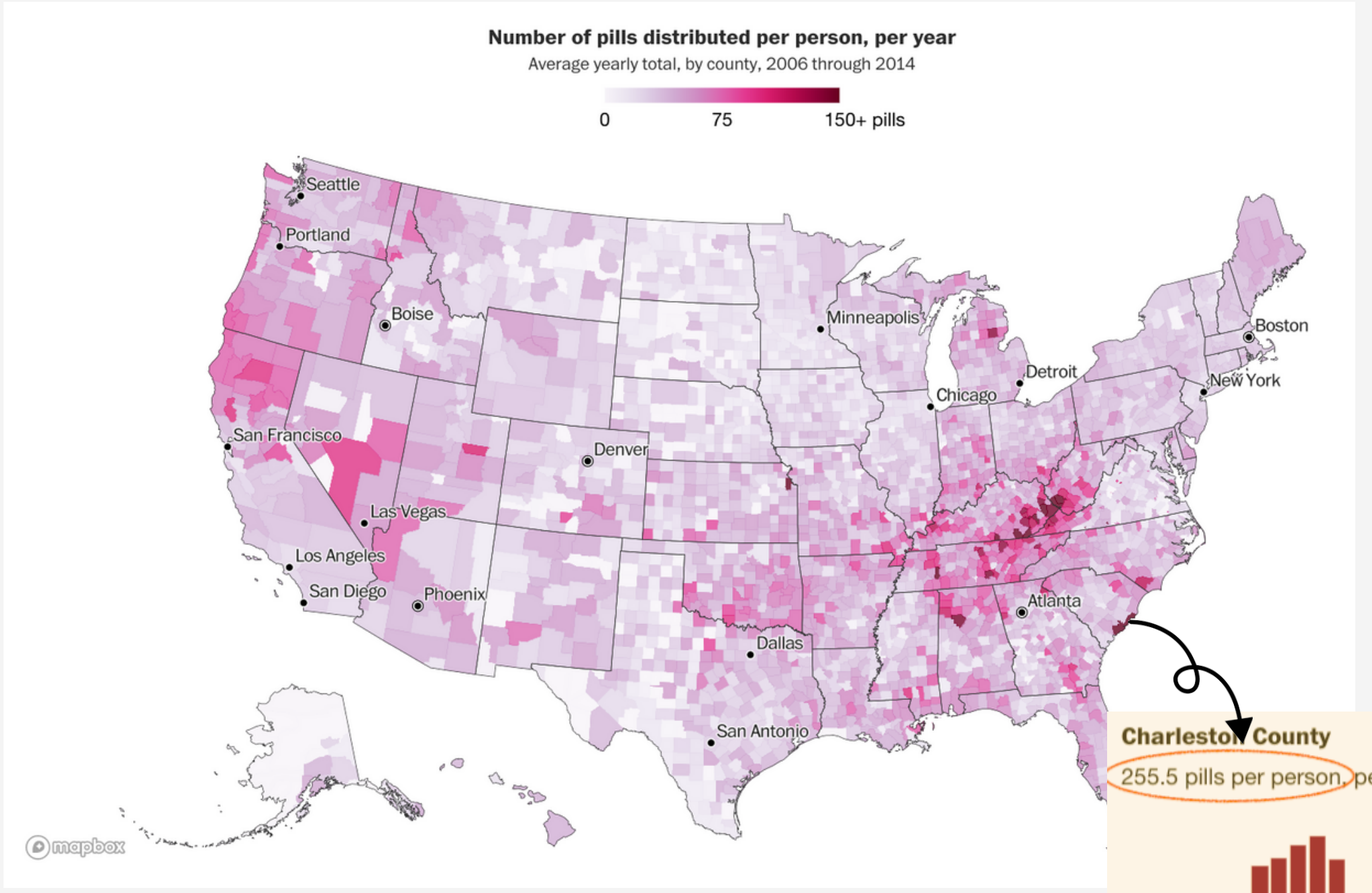
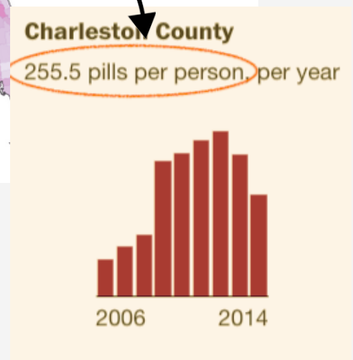
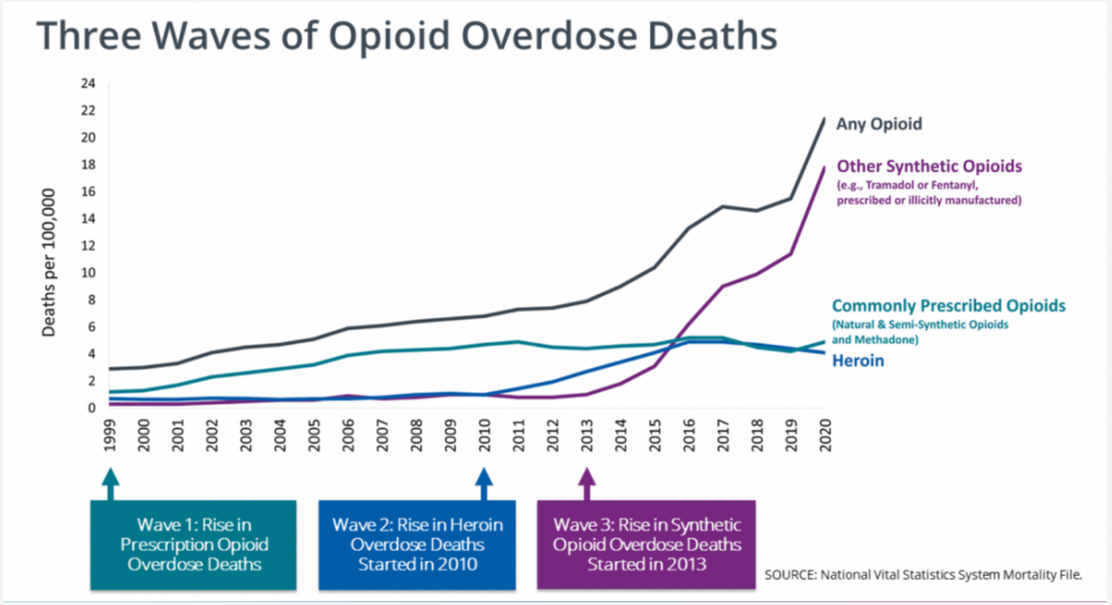
OVERVIEW OF THE EPIDEMIC







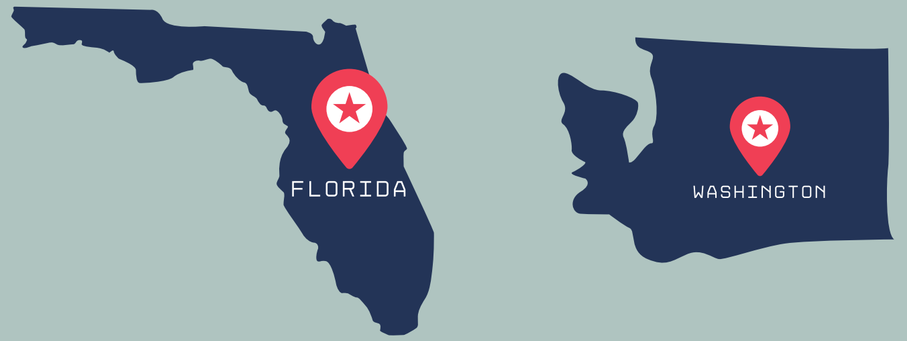
More than **half a million** people in the United States died of opioid drug overdose from 1999 to 2020

PROJECT OBJECTIVE

How effective are policy interventions?

Did the Regulations Decrease Drug Overdose Mortality?

Did the Regulations Decrease Opioid Prescriptions?



POLICIES

- Implemented in 2007
- Patient Evaluation
- Informed Consent
- Periodic Review
- Complete Medical Records

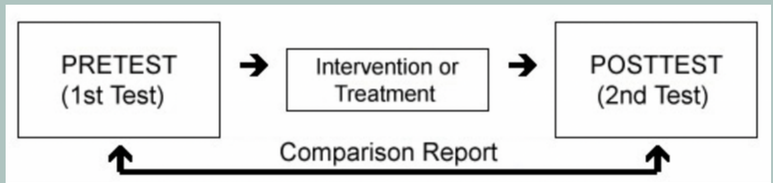
- Implemented in 2010-2012
- Pain Clinic Regulation
- Raids, Arrests, Confiscation
- No Drug Dispensing from Physician's Office
- Regulation on Wholesale Drug Distributors

- Implemented in 2012
- Periodic review
- Maximum Daily Dosage
- Mandatory Pain Management Consultation
- Consultation Documentation

THE APPROACH

Pre-post Analysis:

- Compare how the policy intervention impact the research target overtime



Difference-in-Difference Analysis:

- Assumption: the policy-change target exhibit *similar trends* with non-policy-change targets before the policy change being studies
- Ensure the trends observed in the pre-post analysis are the result of policy intervention by setting treatment group and control group

THE DATA

There are *five control states* with respective to *each treatment state* as follows:

- **Washington** (WA): OR, CA, NV, ID, MT
- **Florida** (FL): GA, SC, AL, MS, LA
- **Texas** (TX): NM, OK, LA, AZ, CO

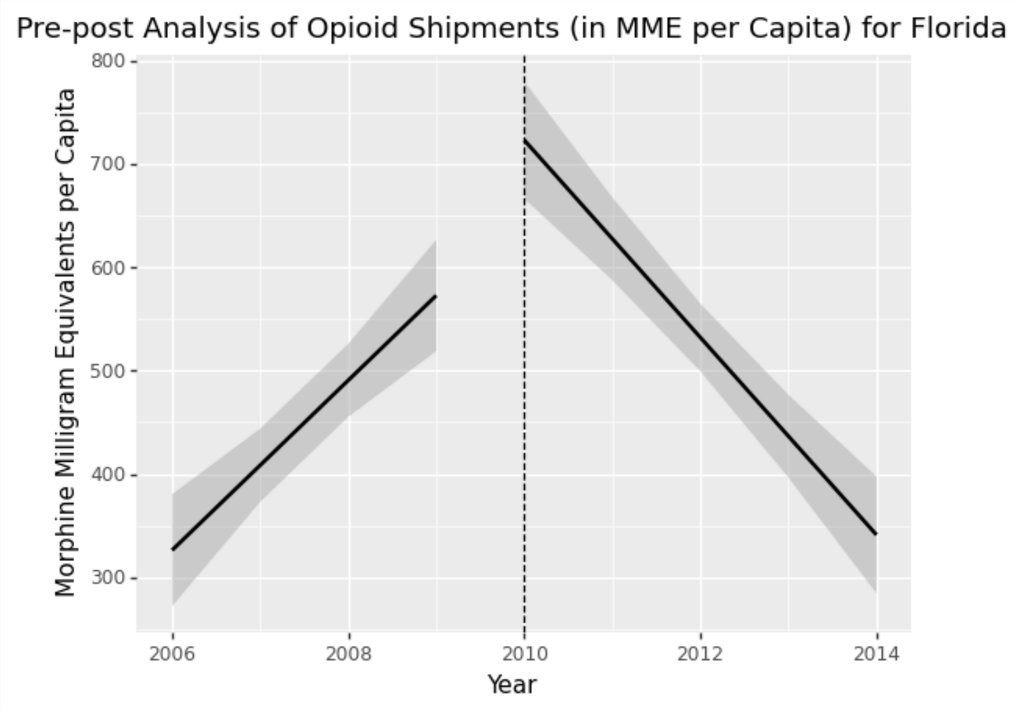
Three datasets were retrieved, cleaned, and merged with the help of FIPS Code for this analysis:

- **Opioid Prescriptions Data** (2006-2014)
- **Mortality Data caused by Drug Overdose** (2003-2015)
- **County Population Data** (2003-2015)

KEY FINDINGS

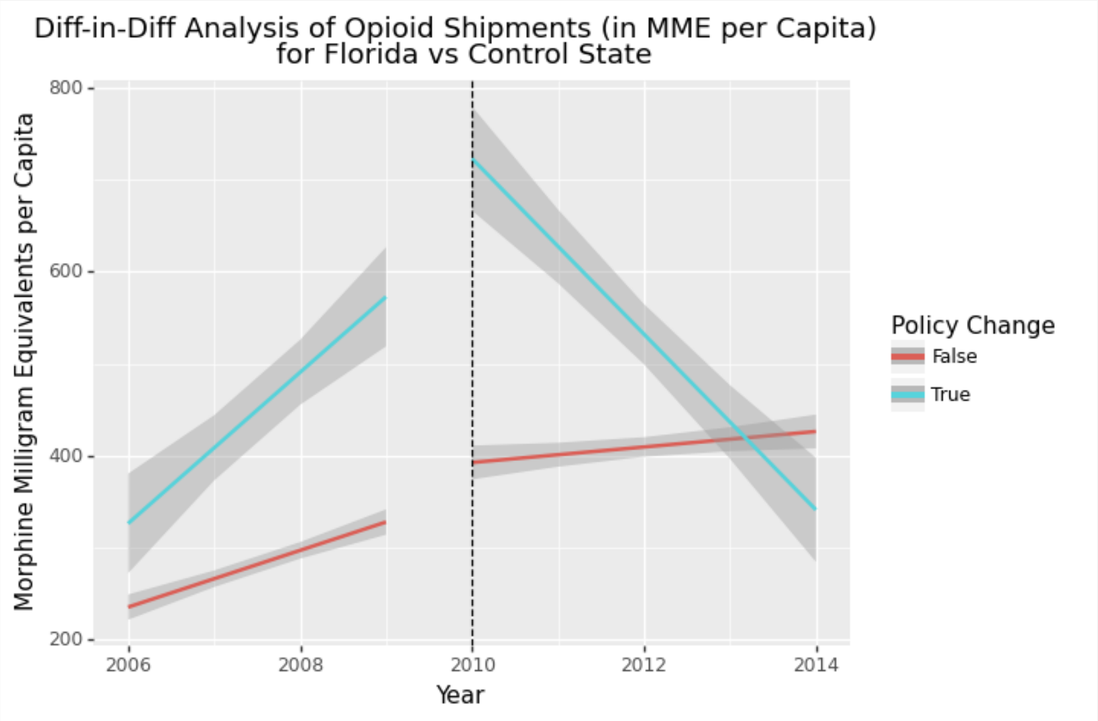
Opioid Shipment Rate

Pre-post Analysis



There was a sharp decline in opioid shipment rate after the policy implementation in Florida.

Diff-in-Diff Analysis

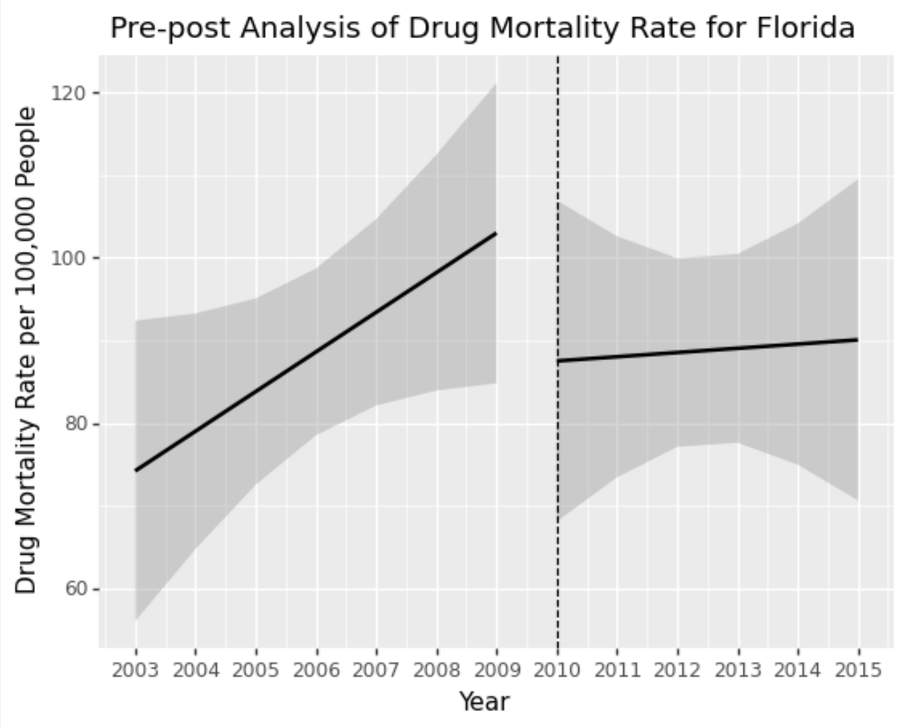


The opioid policies was effective in Florida. The drug shipment showed a drastic decrease in Florida compared to the persistent increase in opioid prescription in treatment states.

KEY FINDINGS

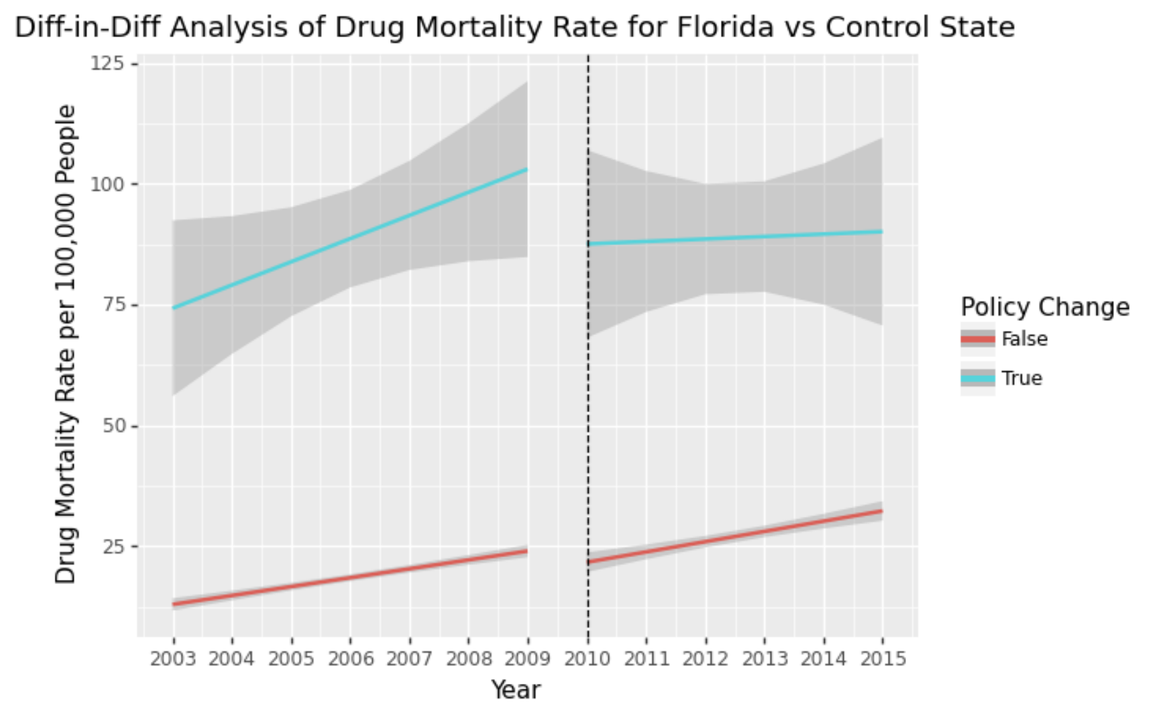
Drug Mortality Rate

Pre-post Analysis



The drug mortality rate became flattened after the implementation policy in Florida.

Diff-in-Diff Analysis

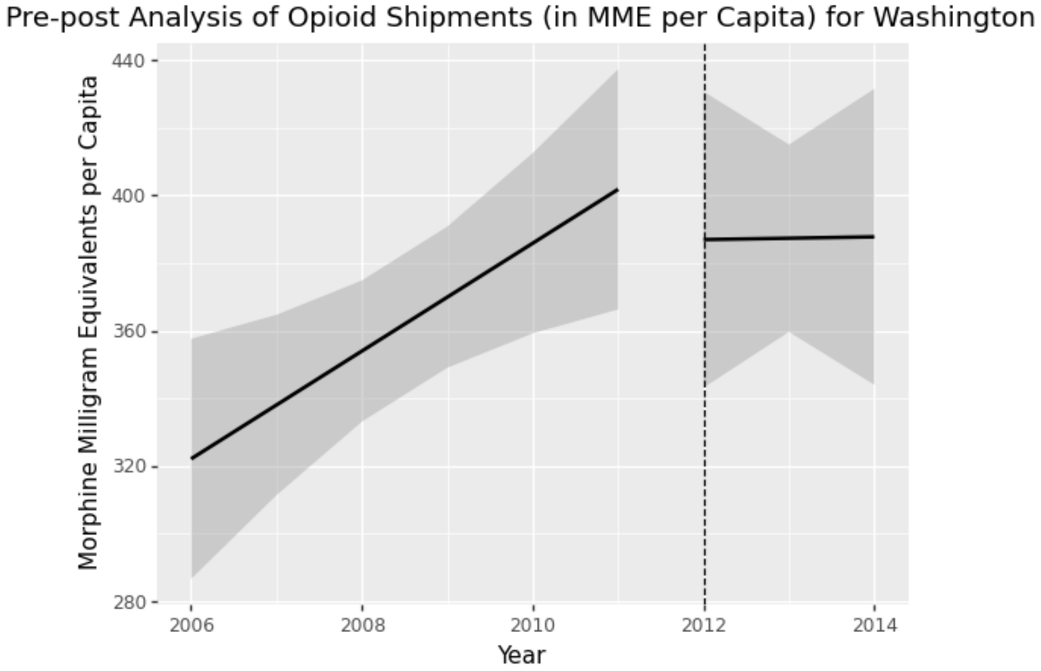


Drug mortality exhibited a clear decline after the drug policy implementation and became flattened afterward, while the drug mortality rate steadily increased in states without policy implementation.

KEY FINDINGS

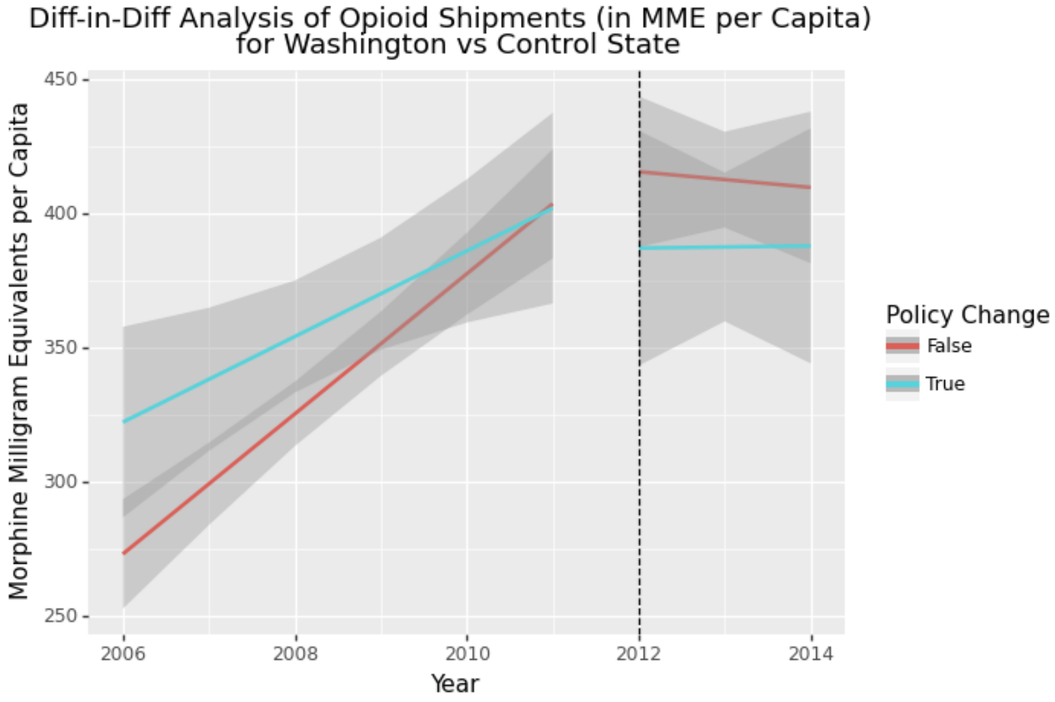
Opioid Shipment Rate

Pre-post Analysis



The opioid shipment rate dropped and stayed plateau after the policy implementation in Washington.

Diff-in-Diff Analysis

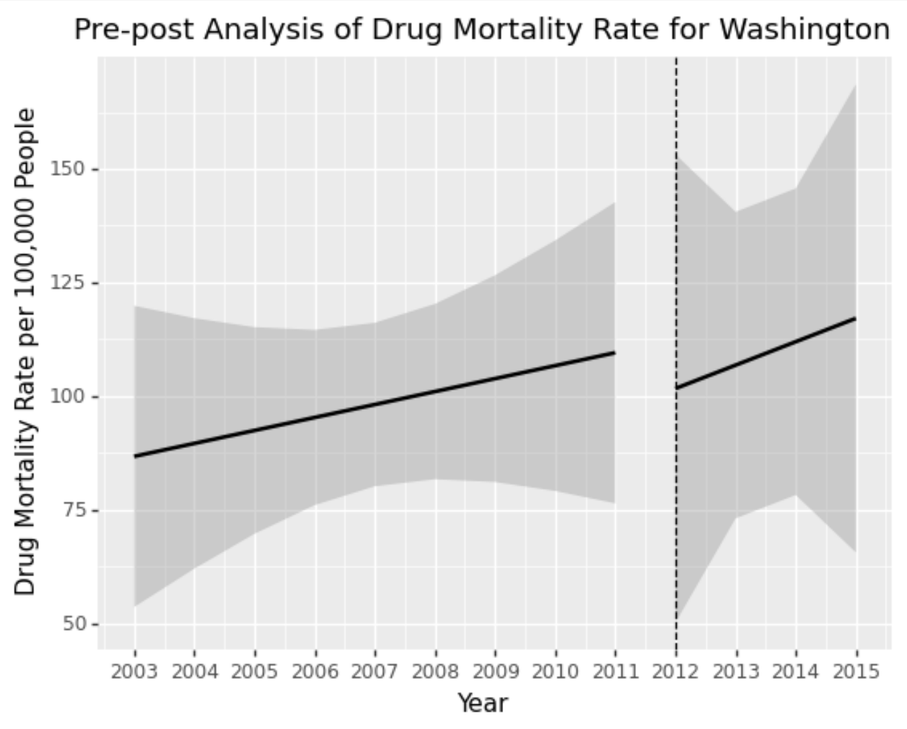


The opioid policies seems not effective in Washington. There was a lower degree of decline in opioid shipments in Washington compared to the decrease in treatment states.

KEY FINDINGS

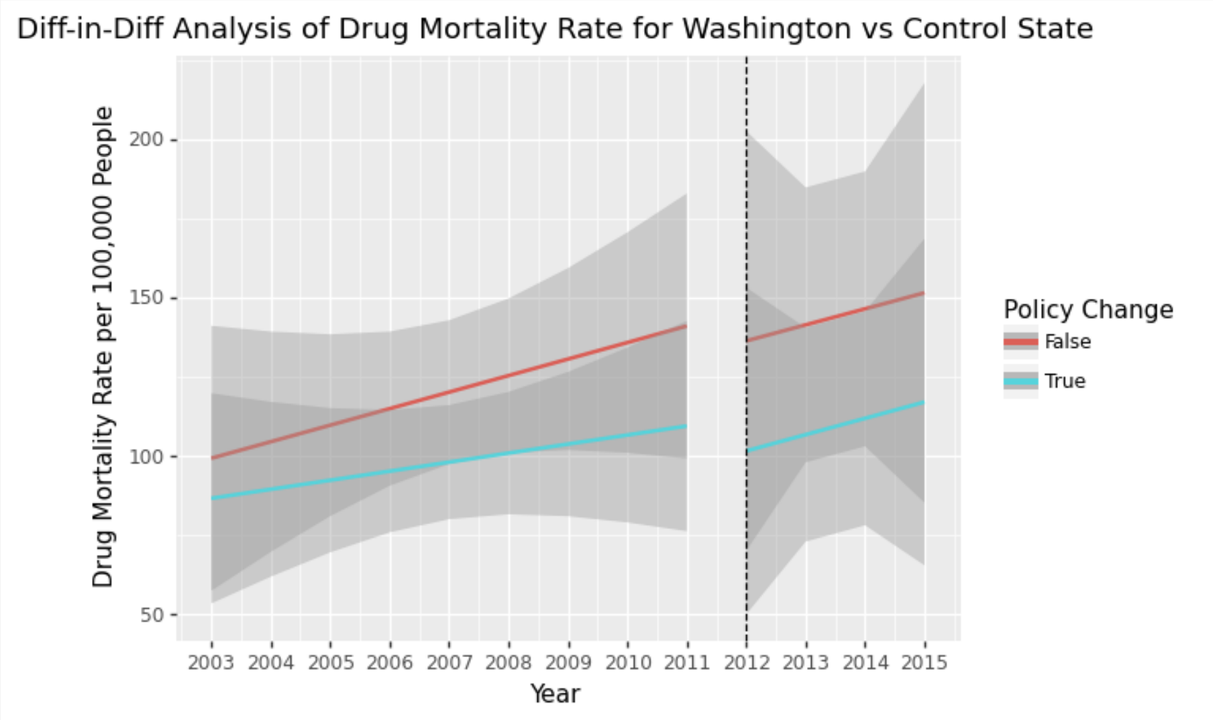
Drug Mortality Rate

Pre-post Analysis



The regulation in Washington seemed to have little effect on reducing the drug mortality rate since the mortality rate rose quicker than before.

Diff-in-Diff Analysis

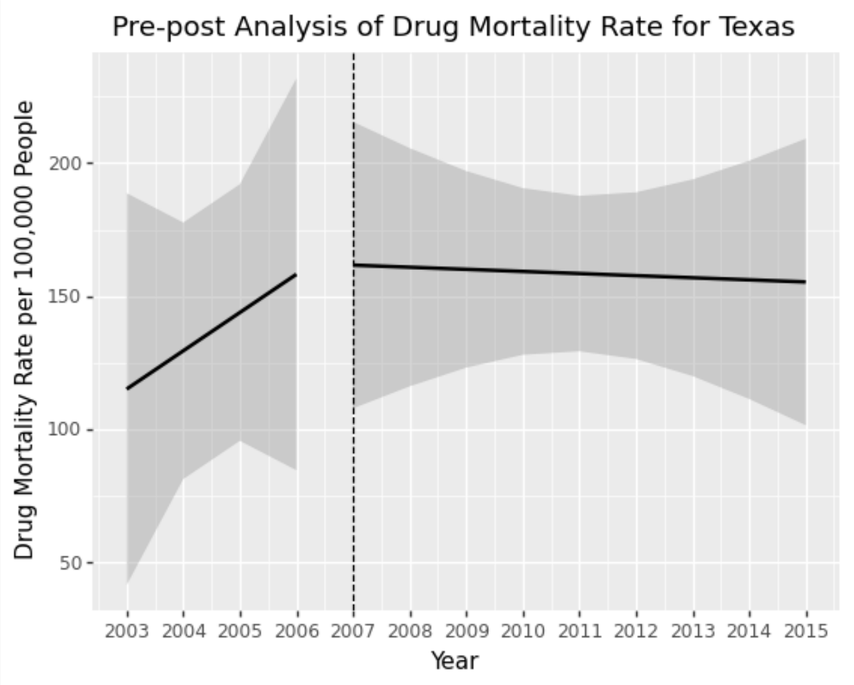


There was a temporary decline followed by continuous growth in the mortality rate post-policy adoption, but the rate still increased at the same rate as that of controlled states in the following years.

KEY FINDINGS

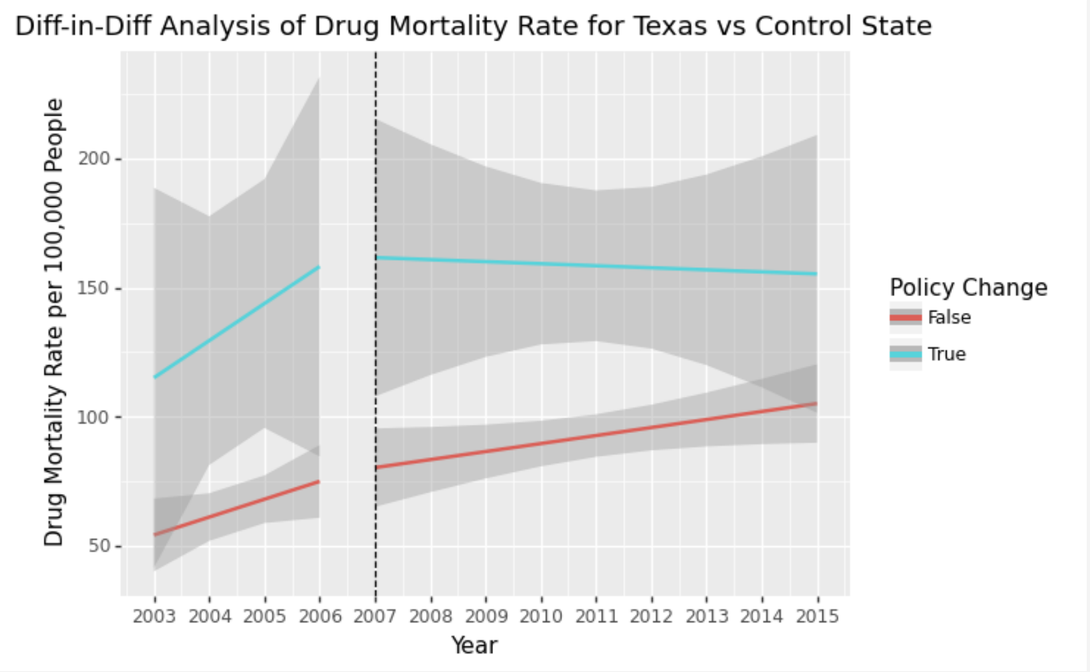
Drug Mortality Rate

Pre-post Analysis



After policy implementation, we observed a relatively slow decrease, suggesting the regulation had a positive effect on the drug mortality rate in Texas.

Diff-in-Diff Analysis



For DID, we could see that the drug-related mortality rate slightly declined after policy implementation. This indicates that opioid policy indeed helped lower the drug mortality rate.

LIMITATIONS

- Opioid Supply = Opioid Demand
- No data for counties with less than 10 drug overdose deaths
- Project scope is limited to prescribed opioids
- Positive impact are attributed to regulatory changes only

CONCLUSIONS

Based on the graph of pre-post and difference-in-difference analysis on both drug mortality rate and opioid shipment rate:

- The drug policy in Florida drastically decreased opioid shipments but produced limited effect on reducing drug overdose.
- Washington’s drug policy was not effective based on the DID analysis.
- For Texas, the drug policy played a positive role in decreasing the drug mortality rate.

THANK YOU