

The Link Between Marijuana Legalization and Opioid Overdoses

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Abstract

We found that only just 5-years after legalizing marijuana, states with legal marijuana see a decrease in opioid deaths relative to those where it is still illegal.

Introduction

The purpose is to replicate the famous paper by Lott and Mustard and determine if there is a significant causal relationship between the passing of gun laws and crime in the United States.

We attempt to replicate their findings using various methods of causal inference separate from the original panel data method.

Background

Since 2012, 14 states have made recreational use of marijuana legal.

We use legalization of marijuana as a random assignment of ability to use marijuana over opiates. There's no difference between states, except that more liberal states may be more likely to legalize marijuana.

We assume that treatment is a random assignment of freedom to use marijuana for opioid users.

Data

We ignore the District of Columbia

Table 1: Treatment Year of States

State	Treatment Year
Alaska	2014
Arizona	2020
California	2016
Colorado	2012
Illinois	2019
Maine	2016
Massachusetts	2016
Michigan	2018
Montana	2020
Nevada	2016
New Jersey	2020
Oregon	2014
Vermont	2018
Washington	2012

Table 2: Mean Opioid Deaths per State from 1999 to 2020

State	Mean Death Rate
Alabama	11.016523
Alaska	14.470724
Arizona	16.903674
Arkansas	10.787611
California	10.816570
Colorado	14.608636
Connecticut	16.326355
Delaware	18.629955
Florida	15.913815
Georgia	10.161905
Hawaii	10.650873
Idaho	10.583673
Illinois	12.692079
Indiana	14.742777
Iowa	7.102904
Kansas	9.499878
Kentucky	21.053527
Louisiana	16.042985
Maine	15.496395
Maryland	19.348076
Massachusetts	17.563764
Michigan	14.724472
Minnesota	8.237864
Mississippi	9.945878
Missouri	15.143731
Montana	11.169932
Nebraska	5.741136
Nevada	19.320376
New Hampshire	17.168707
New Jersey	14.313014
New Mexico	22.240670
New York	10.733684
North Carolina	13.665396
North Dakota	5.198840
Ohio	19.290818
Oklahoma	15.716280
Oregon	11.792944
Pennsylvania	19.639422
Rhode Island	19.014600
South Carolina	13.456070
South Dakota	5.784089
Tennessee	17.897485
Texas	9.033012
Utah	17.086345
Vermont	13.268174
Virginia	10.816864
Washington	13.914318
West Virginia	28.376235
Wisconsin	12.377786
Wyoming	11.644840

Table 3: Average Death Rate by Year

Year	Mean Death Rate
1999	5.737328
2000	6.202161
2001	7.111196
2002	8.295035
2003	9.219804
2004	9.629441
2005	10.295837
2006	11.750586
2007	12.316517
2008	12.669908
2009	12.517710
2010	12.929883
2011	14.068499
2012	13.939109
2013	14.724975
2014	15.842746
2015	17.447247
2016	20.412369
2017	21.994138
2018	21.193078
2019	22.111916
2020	28.085816

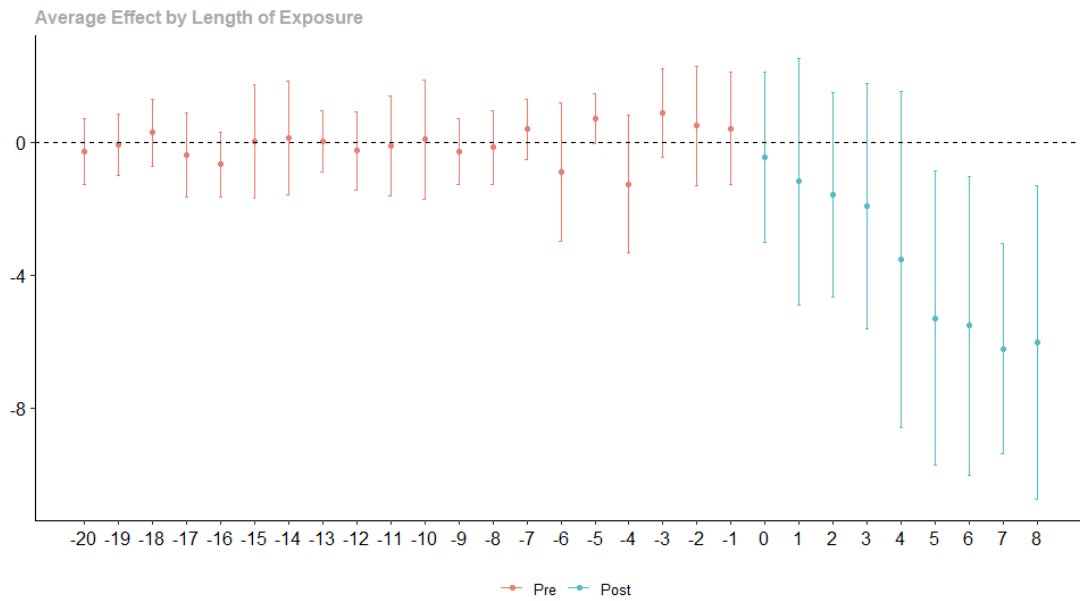


Figure 1: ATE of treatment year on opioid death rate per 100k

Methodology

Discussion

As expected, opioid deaths goes down. Marijuana becomes a substitute for opioids. More liberal states may be more likely to legalize Marijuana.

Conclusion

Marijuana legalization leads to less opioid deaths. Legalizing marijuana can save lives.