How Does Cannabis Legalization in the US Impact the Ongoing Opioid Epidemic: A Policy Bundles Approach

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This Study Examines the Impact of Cannabis Legalization on Opioid Overdose Deaths in the United States by Using a Nuanced Policy Bundles Approach.

Introduction

The United States is in the midst of an opioid epidemic.

There were 108,000 drug overdose deaths in the United States in 2022 and 82,000 of these deaths involved opioids.

An alarming statistic is that the number of opioid overdose deaths in 2022 was ten times the number of opioid overdose deaths in 1999.

Deaths from both Natural and Synthetic Opioids contribute to the opioid epidemic.

Past Literature and Hypothesis

One argument is that medical and recreational cannabis legalization may decrease opioid overdose deaths by decreasing reliance on opioid for chronic pain management (Bachhuber et al. (2014).

Another counter argument is that medical cannabis legalization may act as a stepping-stone or a gateway for further substance abuse involving opioids (Shover et al. 2019, Nguyen et al. 2024).

What Are Policy Bundles

The policy bundle scales essentially comprise of three dimensions, Pharmaceutical, Permissive and Fiscal.

The pharmaceutical bundle comprises of marijuana policies that approximate pharmaceutical regulations.

The permissive policy bundle treats cannabis like any other consumer good that requires minimum oversight.

The Fiscal policy bundle essentially emphasizes states seeing marijuana as a source of revenue.

Table 1: Descriptive Statistics

Variable	Observations	Mean	S.D	Min	Max
Opioid Death Rate per 100000 People (Outcome Variable)	1200	15.75	10.46	0.30	84.12
Pharmaceutical	1200	15.14	24.36	0	63.33
Permissive	1200	12.93	19.13	0	75
Fiscal	1200	9,2	19.16	0	83.33
Unemployment Rate	1200	5.21	1.96	1.9	13.7
Poverty Rate	1200	12.17	3.34	3.7	23.1
% of Medicaid Beneficiaries	1200	17.88	6.95	5.03	46.06
State Minimum Wage	1200	7.09	2.01	1.6	15.74
Gini Co-efficient	1200	58.75	4.17	47.02	71.99

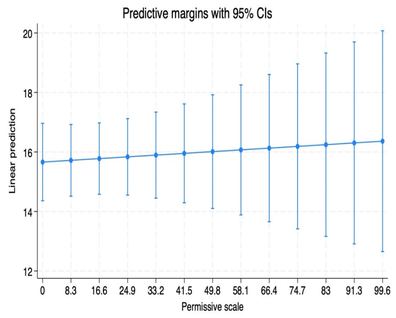
Note: The number of US states for the analysis is 50 and the time duration is from 1999-2023

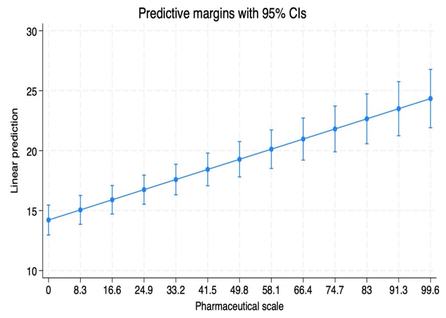
Table 2: GLS Regression with State and Year Fixed Effects

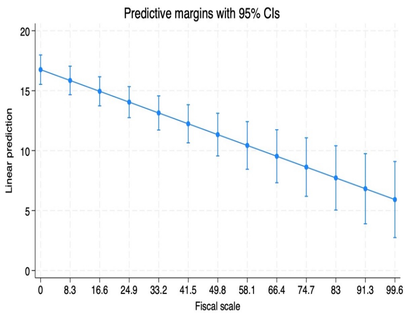
	(Model 1) Deaths Per 100000 People	(Model 2) Deaths Per 100000 People	(Model 3) Deaths Per 100000 People	(Model 4) Deaths Per 100000 People
Pharmaceutical Scale	.102***	.057***		
	(.013)	(.011)		
Permissive Scale	.007		.013	
	(.021)		(.019)	
Fiscal Scale	-.109***			-.037***
	(.017)			(.014)
Unemployment Rate	-.542***	-.428***	-.474***	-.526***
	(.118)	(.119)	(.12)	(.121)
Poverty Rate	.05	.052	.008	-.015
	(.107)	(.109)	(.11)	(.11)
Medicaid Population	.835***	.786***	.84***	.879***
	(.049)	(.049)	(.049)	(.05)
State Minimum Wage	1.575***	1.334***	1.572***	1.779***
	(.156)	(.151)	(.155)	(.155)
Gini Co-efficient	-.238***	-.182***	-.19***	-.212***
	(.049)	(.05)	(.05)	(.051)
cons	5.217*	3.672	2.927	3.129
	(3.026)	(3.072)	(3.106)	(3.096)
Observations	1200	1200	1200	1200
Within R^2	.686	.672	.664	.666

Standard errors are in parentheses

*** p<.01, ** p<.05, * p<.1







Methods

Data Source:

We use Data from the Center for Disease Control's (CDC) WONDER multiple cause of death database to isolate drug overdose deaths that involved either natural or synthetic opioids from 1999 – 2023.

We use the University of Kentucky's State Level National Welfare database for most of the controls.

Regression Method

State and Year fixed effects GLS regressions to analyze the outcome (Death Rate per 100000 People). We also estimate models with each of the bundles separately.

Controls:

Unemployment Rate, Poverty Rate, % of Medicaid Beneficiaries in a State, the Minimum Wage Rate and the Gini Co-efficient.

Results

The pharmaceutical bundle is positively correlated with the opioid overdose crude rate whereas the fiscal bundle is negatively correlated with the opioid overdose death crude rate. Results of the permissive bundle are insignificant.

These results outline the important of carefully considering different approaches to cannabis legalization when analyze its health externalities.

Referencess

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