Criminalizing Opioid Use During Pregnancy: Impacts on All Women's Access to Addiction Treatment

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Important Terms

1. **Punitive Policies (PPs):**
    1. A state policy which characterizes substance abuse during pregnancy as child abuse and warrants punishments such as a termination of parental rights, civil commitment, and, in severe cases, incarceration
    2. Response to the surge in opioid use disorder (OUDs) among pregnant women in the US in the last two decades

2. **Medication Assisted Treatment (MAT):**
    1. The **most effective treatment** for substance abuse disorder (SUD) and OUDs
    2. MAT (buprenorphine or methadone) is effective and completely safe for both the mother and fetus
    3. If detected in infant bloodstream, could trigger PP

3. **Priority Treatment Program (PTP):**
    1. Policies that require treatment facilities to prioritize pregnant women such that they have a higher likelihood of being admitted and receiving prompt SUD/OUD treatment

Punitive Policies=PPs; Medication Assisted Treatment: MAT; Priority Treatment Programs: PTP

Motivation(s)

1. Public Health Concern: Opioid epidemic is a massive public health concern with high economic burden

2. Recent Changes to Federal Law: The Comprehensive Addiction Recovery Act (CARA) was passed to address the rising impact of the opioid epidemic in America in 2016

- the drugs used for medication assisted treatment (MAT) are also among the substances that, if detected in an infant's blood, could trigger a punitive policy (PP).

3. Concerns as to Policy Efficacy: Past scholars have warned that PPs have no proven benefits for maternal or infant health and may be a deterrent for pregnant women to participate in OUD treatment programs.

4. Knowledge Gaps: Little is known about…

4.1 The interactions between PPs and PTPs when active in the same state

4.2 The impacts that state-level PPs have on behavior and treatment of non-pregnant women

Punitive Policies=PPs; Medication Assisted Treatment: MAT; Priority Treatment Programs: PTP

Research Questions

1. In states with PPs, will fear act as a deterrent to expectant mothers in the pursuit of addiction treatment, reducing the demand for addiction treatment?

2. How will PPs impact the prevalence of MAT use for all women of childbearing age?

In essence, what are the effects of **implementing state-level PPs on the rates of admission of pregnant women** into addiction treatment programs and **on the prevalence of MAT planned at intake for women of childbearing age**?

Policy Landscape: 2016 CARA Changes

- The CARA Act of 2016 expanded the definition of an abused child:
  - infants who tested positive for any drug, not only illegal substances, in their blood sample
- State level variations in implementation and timing
- Some states have priority treatment programs (PTPs)
  - Some states have both!

Policy type:		Punitive	Priority treatment
State	FIPS CODE	Effective year	Effective year
AL	1	2013	2012
AK	2		2007
AZ	4	2009	
AR	5	2005	Pre-2004
CA	6		
CO	8	2005	2013
CT	9	2017	
DE	10		2010
DC	11	Pre-2004	Pre-2004
FL	12	Pre-2004	
GA	13	2014	Pre-2004
HI	15		
ID	16	2007[w]	
IL	17	Pre-2004	Pre-2004
IN	18	Pre-2004	
IA	19	2018	2015
KS	20		Pre-2004
KY	21	2018	2015
LA	22	2005	Pre-2004
ME	23		2004
MD	24	Pre-2004	Pre-2004
MA	25	Pre-2004	

Literature Review

1. **Haight et al. 2018**: Analyzed HCUP data and found that the prevalence of OUD in delivery hospitalizations more than quadrupled in 15 years

    1.1 opioid exposure is associated with adverse maternal and neonatal outcomes, including preterm labor, stillbirth, neonatal abstinence syndrome (NAS), and maternal mortality

2. **Schiff et al. 2017 :** MAT with buprenorphine or methadone was found to be the optimal treatment for pregnant women with an OUD

    2.1 safe for mother and infant and associated with improved maternal and infant outcomes

3. Walter 2023: 3700 women with only MAT substances in their systems were reported by hospitals to their respective states for substance abuse related child abuse.

4. Atkins and Durrance 2020: using TEDS-A data from 2000-2014 find that states that adopt PPs saw pregnant admissions drop by 29%

Novel Expansions: Extending analysis after 2016 CARA period and considering MAT

Data: TEDS-A 2013-2020

Exposure Variable: Presence and effective dates of punitive policies

Outcome Variables:

- Proportion of admitted pregnant women (% out of a sample of women <40)
- Proportion of CB-aged women that have MAT planned at admission (% out of women <40)

Individual-level Demographic Covariates: gender, race, ethnicity, education level, employment status, and age

Policy Landscape Covariates: active PTP , Medicaid expansion status, less than 5 opioid treatment programs (OTP) per million inhabitants in a state, OTPs decreasing over time in a state

Data Sources: SAMHSA TEDS-A, Maclean et al. (2022), Tabatabaeepour et al. (2022), Kaiser Family Foundation, Kennalley et al. (2023)

Descriptive Statistics of Sample

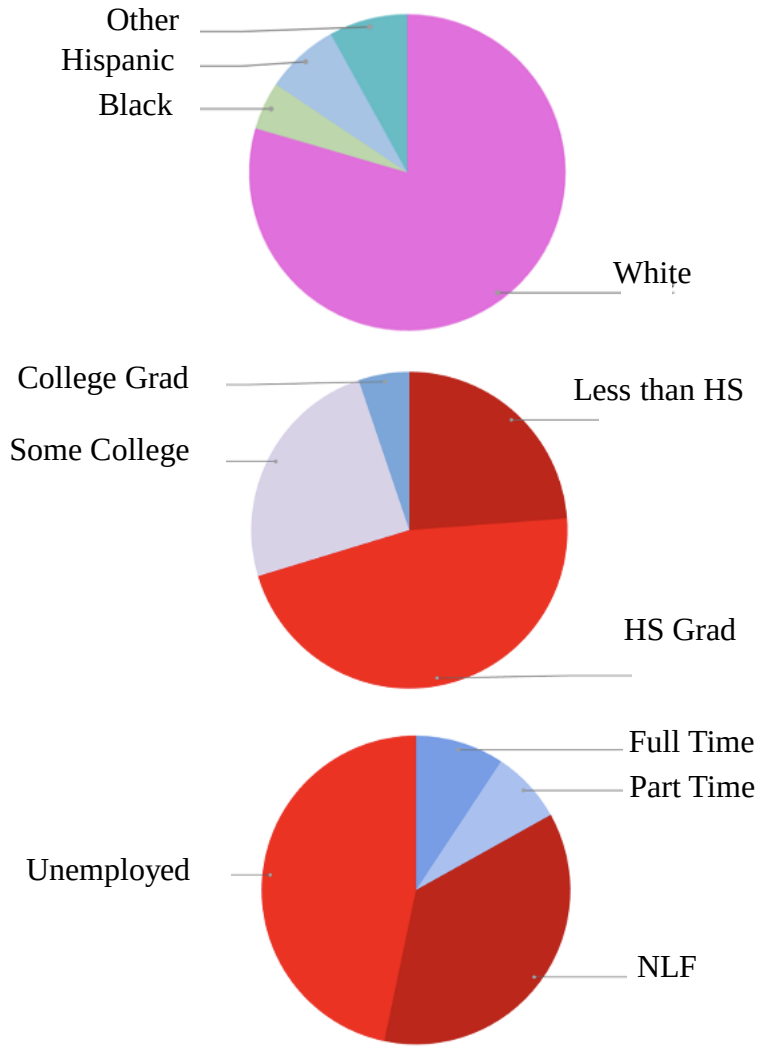
One sentence summary:

This sample of **childbearing-age women** with **opiates as primary substance** is…

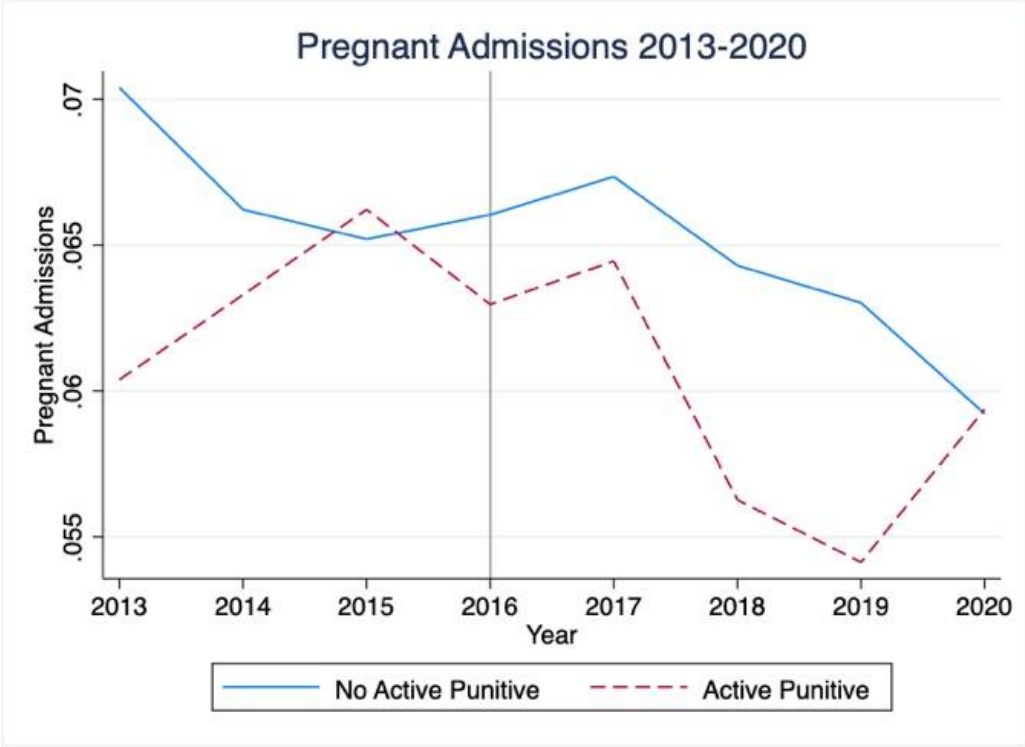
- largely white (86.1%)
- with the vast majority of all the women not having attended college (70.3%)
- and either unemployed (46.7%) or not in the labor force (36.4%).

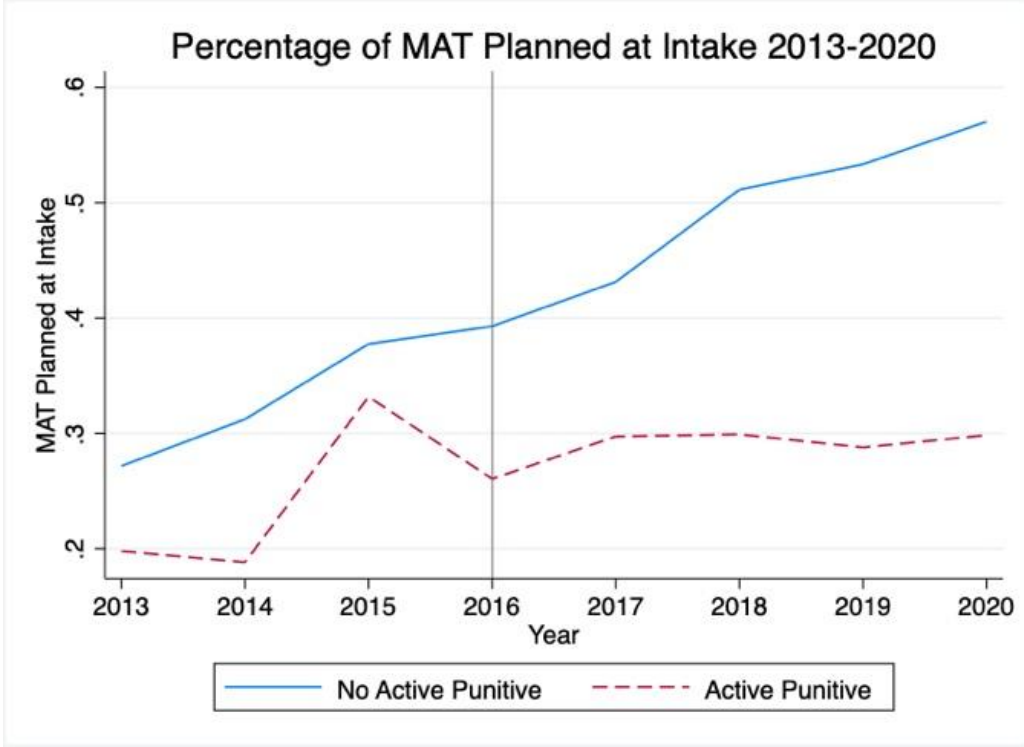
Outcomes of Interest:

- PP Active: 43.1%
  - 47.9% of those in isolation
- PTP Active: 38.2%
- Both Policies: 22.5%
- MAT planned at intake 35%



First Look at Trends: Preg Admissions & MAT





Methodology: Difference in Difference with Interactions

Basic Model: Difference in Difference Regression:

$$Y_{ist} = \alpha Punitive_{ist} + \gamma(Punitive_{ist} \times \phi_{ist}) + Z_{ist}\theta + X_{ist}\beta + \delta_s + \tau_t + \varepsilon_{ist}$$

- Y_{ist} is one of the two outcome variables (pregnant at admission or MAT planned at admission)
- α is the dif-in-dif estimator
- vector X_{ist} contains individual-level demographic
- vector, Z_{ist} contains state-level policy landscape variables
- δ_s represents state fixed effects, τ_t represents year fixed effects

Incorporating Interactions (ϕ_{ist}) in the second set of regressions:

- When pregnant admissions is the outcome: ϕ_{ist} represents the condition where a state has no PTPs
- When MAT planned at intake is the outcome, ϕ_{ist} represents the condition where a state has less than 5 OTPs per million habitants

Methodology: Event Study Model

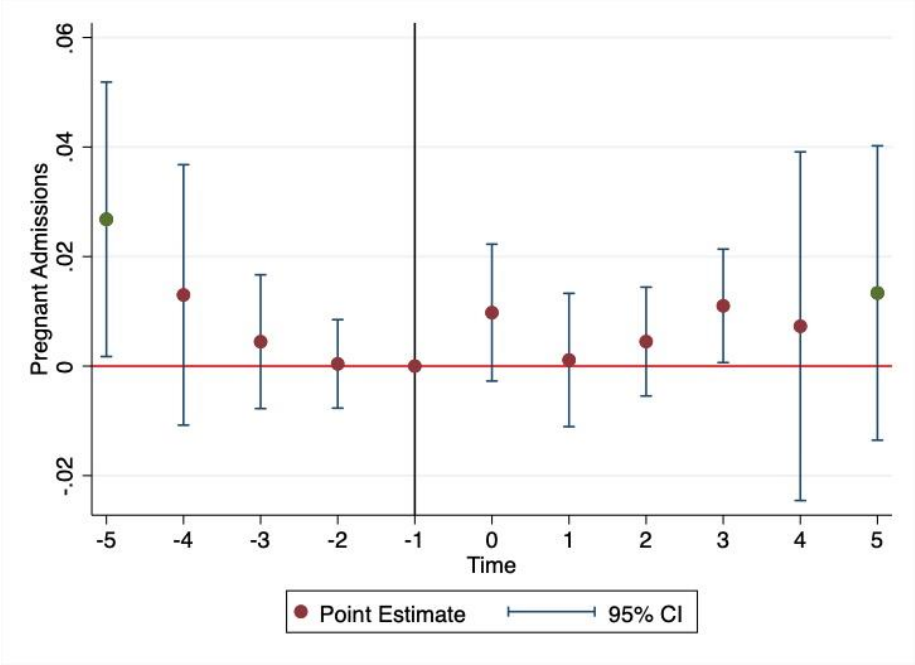
$$Y_{ist} = \alpha + \sum_{j=2}^{5} \beta_j (Lag\ j)_{ist} + \sum_{k=1}^{5} \gamma_k (Lead\ k)_{ist} + Z_{ist}\theta + X_{ist}\psi + \delta_s + \tau_t + \varepsilon_{ist}$$

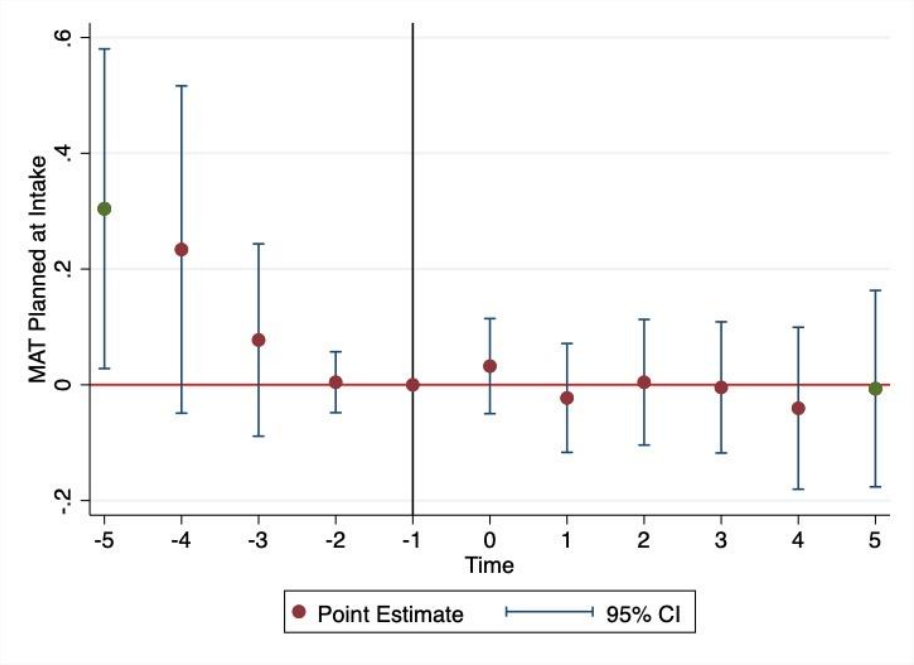
- Y_{ist} is one of the two outcome variables (pregnant at admission or MAT planned at admission)
- Lag j and Lead k are variables that indicate the number of years away from state-specific PP implementation for any given observation
- vector Z_{ist} contains state-level policy landscape variables
- vector X_{ist} contains individual controls
- δ_s represents state fixed effects, τ_t represents year fixed effects

Results: Event Study

For pregnant admissions and MAT planned at intake:

- No pretreatment trends were witnessed in the four years prior to implementation
- While the fifth lead fails to adhere to parallel trend requirements
  - Limitation!





Results: 1st Round Regressions

Counterintuitive findings for admissions…

- PPs significantly increase the likelihood of pregnant admissions by **0.56 percentage points (8.8%)**
- PTPs decrease pregnant admissions **by 1.68 percentage points (26.3%)**

Findings for MAT use…

- PPs reduce the likelihood of MAT planned at admission for all women under the age of 40
- **4.02 percentage points reduction (11.4%)**

	(1) Pregnant Admissions	(2) Medication Assisted Treatment Planned at Intake
Punitive Policy	0.0056***	-0.0402***
	(0.001)	(0.003)
Less than 5 OTP per million	-0.0012	0.0487***
	(0.002)	(0.003)
OTPs decreasing	-0.0014	-0.1110***
	(0.001)	(0.00181)
Medicaid Expansion	-0.00276*	0.0382***
	(0.002)	(0.002)
Priority Treatment Program	-0.0168***	0.0819***
	(0.004)	(0.005)
Constant	0.0564***	0.2550***
	(0.006)	(0.009)
Observations	1,006,251	1,006,251
R-squared	0.014	0.166
State Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Individual Level Covariates	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results: 2nd Round Regressions

Interaction reduces admissions…

- PPs in isolation reduce pregnant admissions by **1.29 percentage points (20.2%)**
- 47.9% of PPs are PP-only

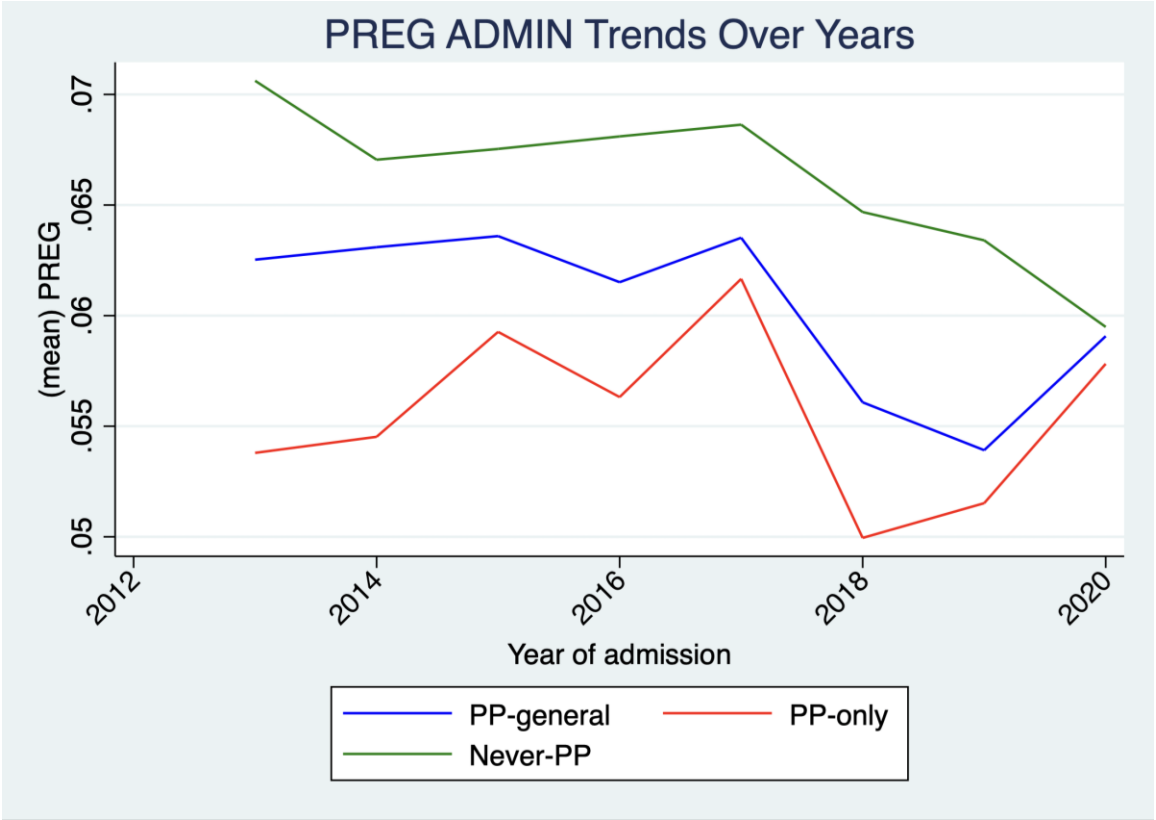
Interaction exacerbates MAT reduction…

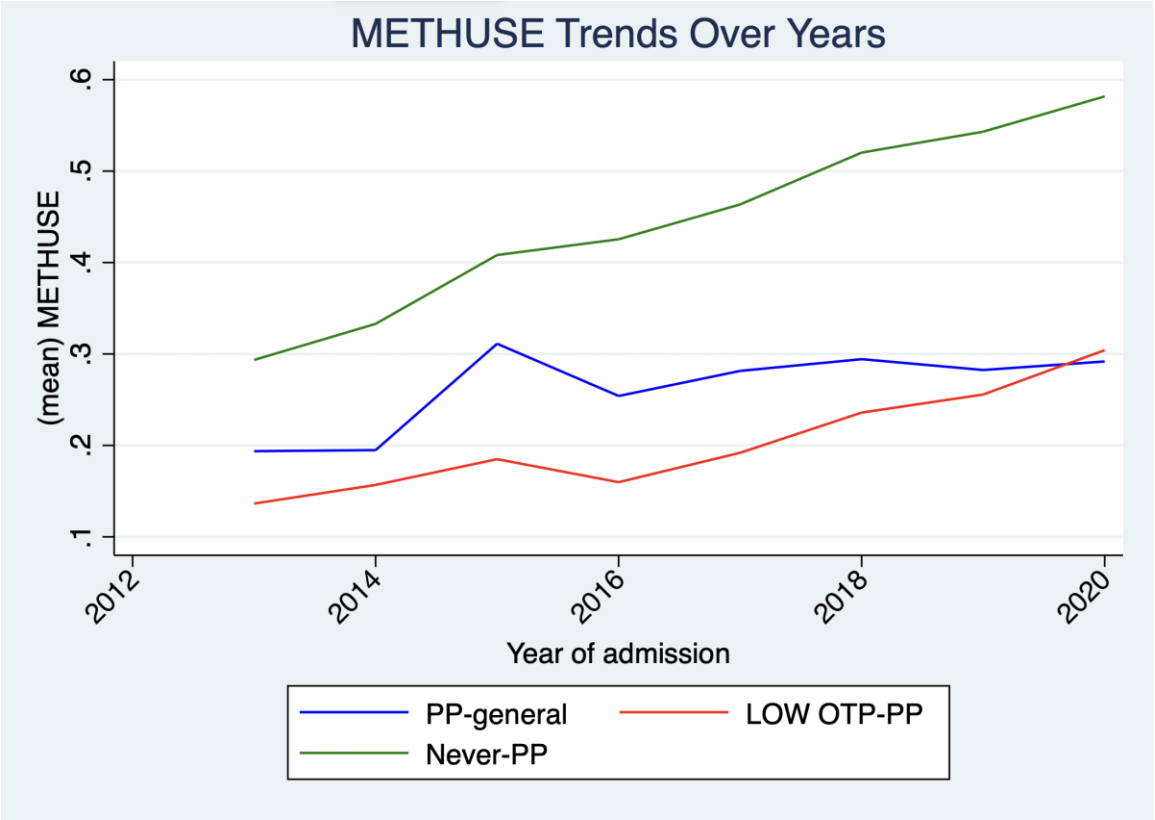
- PPs in state-times with < 5 OTPs per million inhabitants reduce likelihood of MAT **by 5.26 percentage points (15.0%)**
- 1.24 percentage points additional reduction
- 45.2% of PPs have < 5 OTPs per million.

	(1) Pregnancy Admissions with Interaction	(2) MAT Planned at Intake with Interaction
Punitive Policy	0.0108***	-0.0242***
	(0.002)	(0.003)
Punitive Policy and No Priority Program (interaction)	-0.0129***	-
	(0.003)	
Punitive Policy and Less than 5 million OTP per million (interaction)	-	-0.0526***
		(0.004)
No Priority Treatment Program in Place	0.0195***	-
	(0.004)	
…		
Constant	0.0349***	0.2700***
	(0.004)	(0.009)
Observations	1,006,251	1,006,251
R-squared	0.014	0.166
State Fixed Effects	Yes	Yes
Year Fixed Effects		
Individual Level Covariates	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

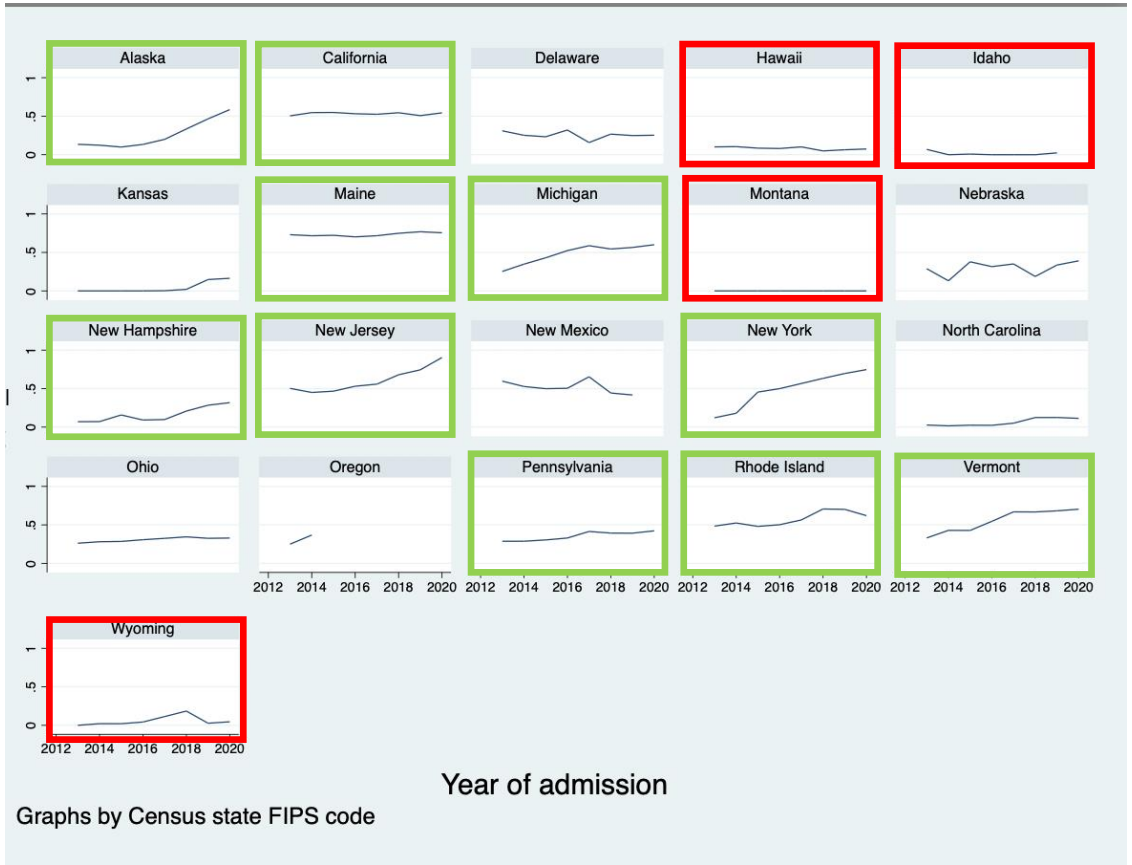
Results: Interactions Matter





MAT Use Over Time in Non-PP and PP States

Never PP



Mean = 0.437

PP-states

Mean = 0.264

Conclusions

PPs interplay with other policies within state-landscapes to produce **complex effects**. When active in isolation, PPs **reduce pregnant admissions** to treatment facilities.

In all policy landscapes explored, PPs **unequivocally suppress MAT use** for all women of childbearing age. More extreme reductions in Low-OTP states.

Policy Implications: #1.1

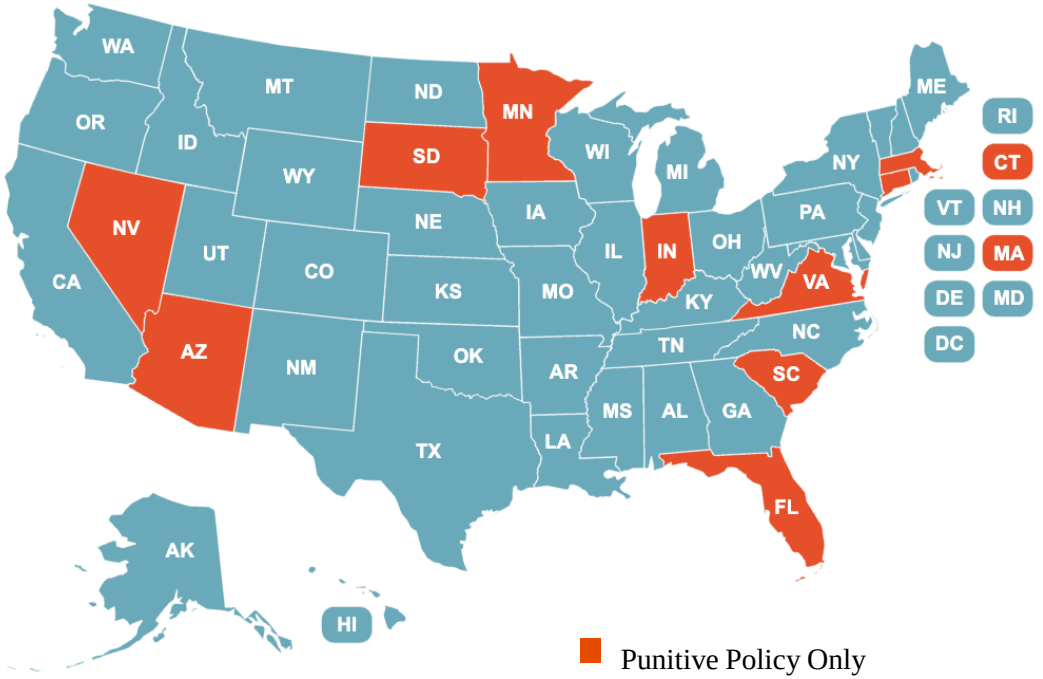
1.1 Interpret Findings from Complex Policy Environments with Caution

- PP may drive up demand for addiction treatment services (by increasing OUDs) and then the subsequent PTPs may expand supply for treatment of pregnant women

Policy Implications: #1.2

1.2 Expand Treatment Incentives for Pregnant Women Esp in PP-only States

- State legislatures ought to consider enacting policies and programs that incentivize pregnant women's admission into treatment facilities in the face of a 20.2% drop in admissions

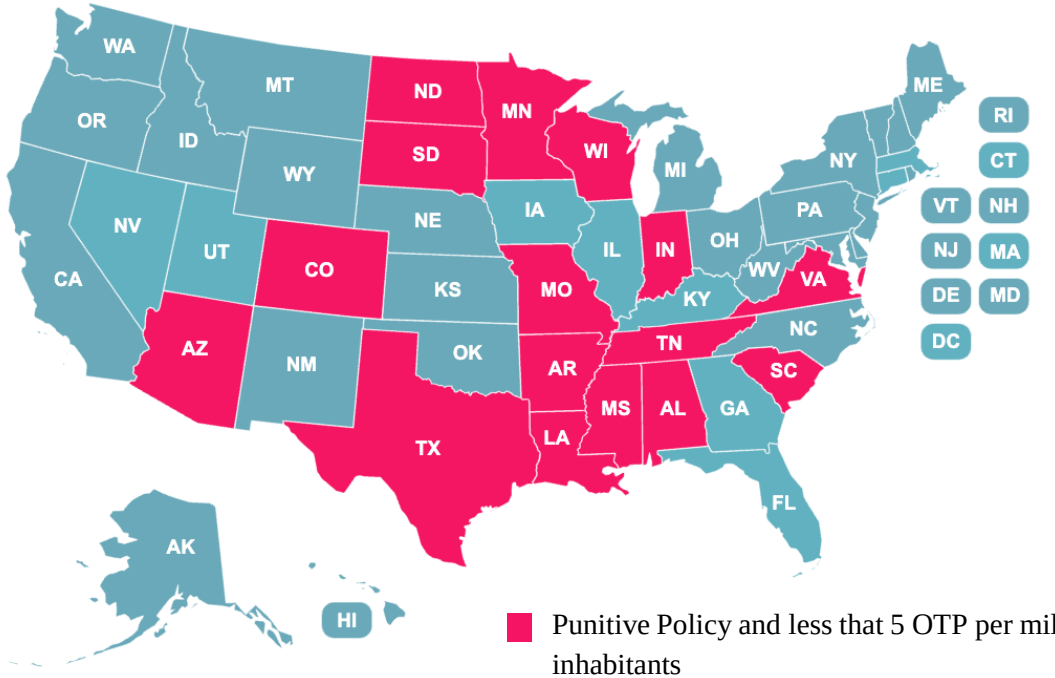


Policy Implications: #2.0

2.0 Expand OTPs and MAT Availability for Women

- Consider amending state definitions of the substances that trigger PPs, specifically absolving substances used for MAT

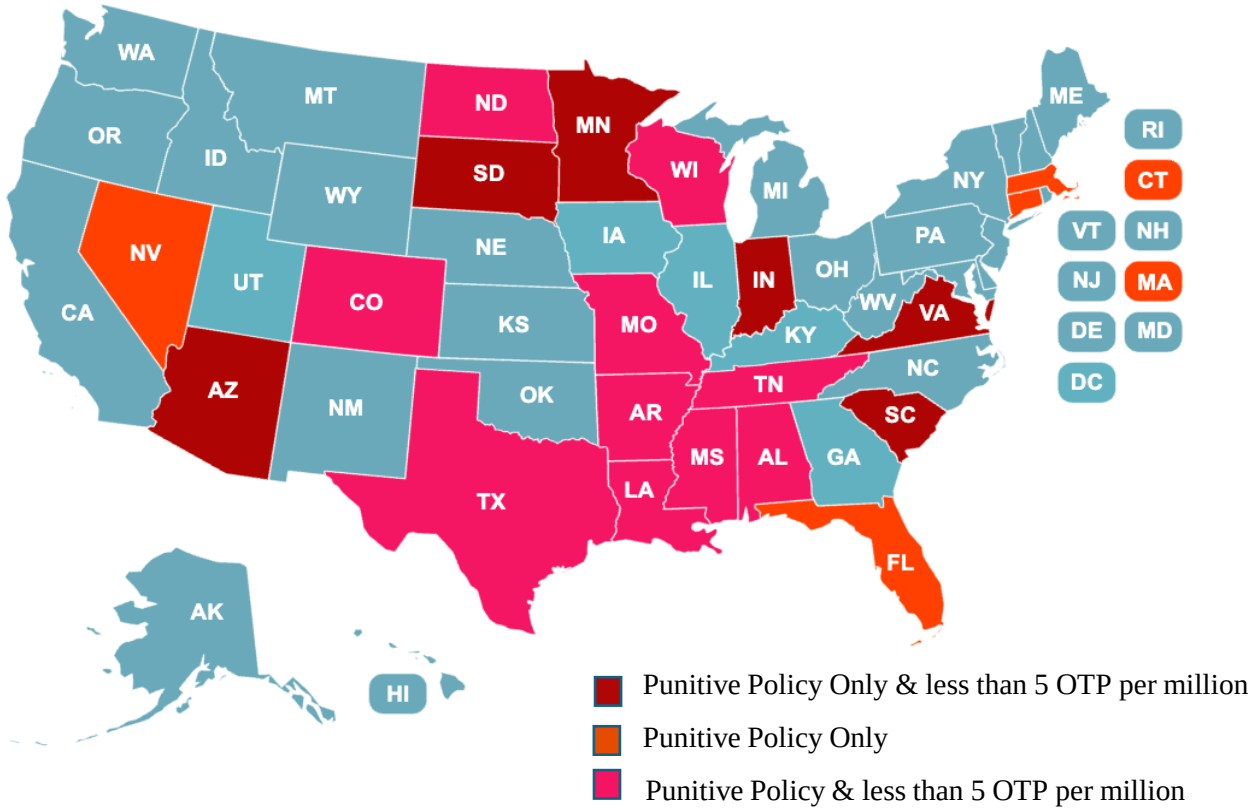
Collateral effects! PPs affect all women through reductions in MAT use!



Extension: Most Extremely Affected?

6 States have PP-only and less than 5 OTPs (dark red)

- Potential exacerbation?
- Pay attention to these 6 states!



Directions for Future Research

- Assess dynamics of program incentives and resource accessibility
  - Esp in 6 critical states
- Sequential policy dynamics between PPs and PTPs
- Use of time-lagged variables to explore the long-lasting maternal and infant health effects
- Impacts on healthcare utilization costs

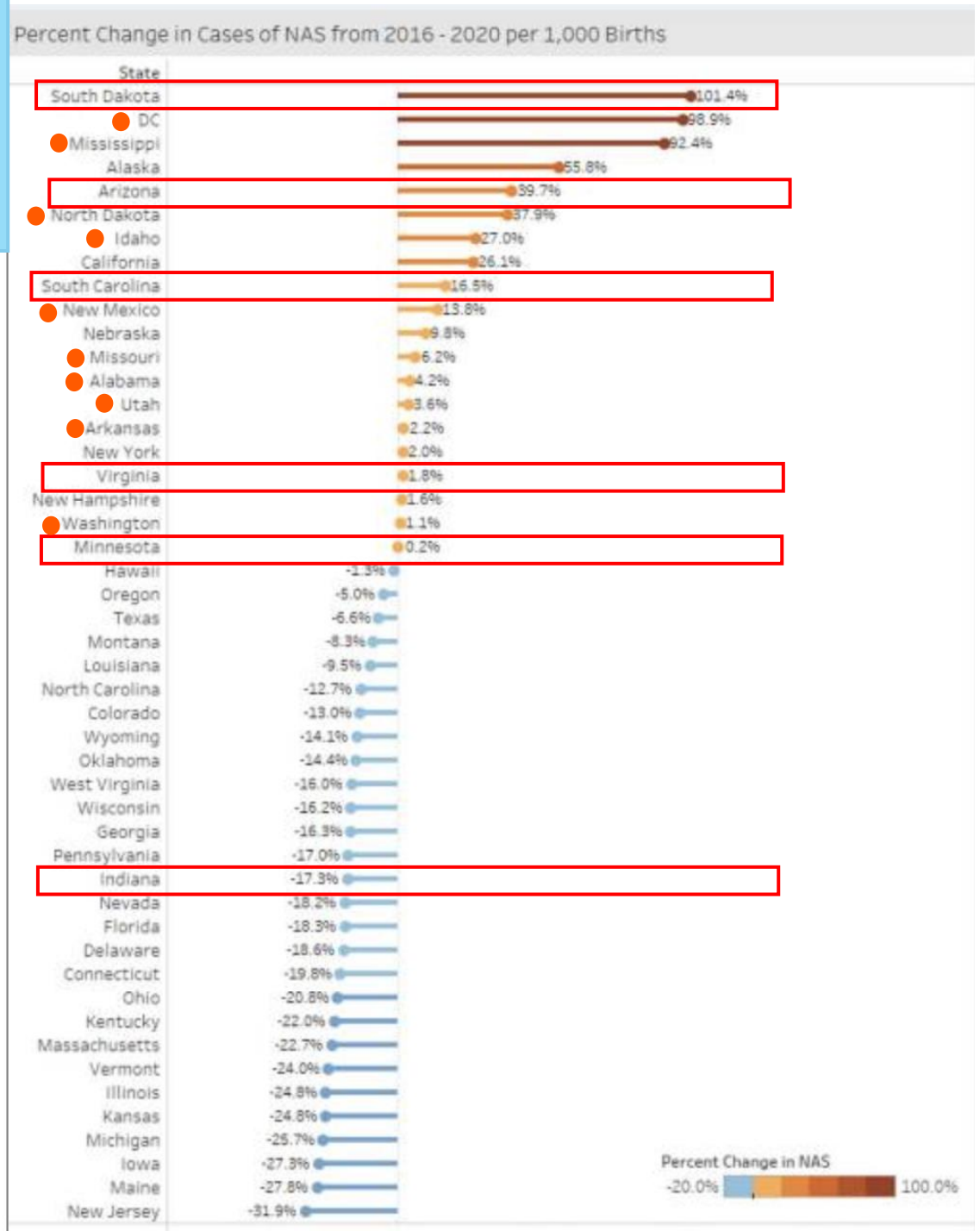
Thank You!

Thanks to IAES for the opportunity!

Special thanks to Professor Kelly Noonan and Quan Le for their insights, support, and encouragement throughout all stages of this research.

Supplements

NAS rates increasing from 2016-2020 in PP states, esp. the extreme 6!



West, K. D., Ali, M. M., Blanco, M., Natzke, B., & Nguyen, L. (2023). Prenatal substance exposure and neonatal abstinence syndrome: State estimates from the 2016–2020 transformed medicaid statistical information system. *Maternal and Child Health Journal*, *27*(Suppl 1), 14–22.

Supplements

Use data pre-2004, to have more complete understanding of dynamics over time-to-treat