# Recreational Marijuana Laws and Substantiated Child Maltreatment

Matt Brown

University of Connecticut

October 24, 2025

# Motivation – why study the effects of RML on substantiated child maltreatment?

- While the effects of recreational marijuana laws (RMLs) on foster care placements have received some empirical attention (Gardner & Osei, 2022; Wallace et al., 2025), much less is known about their effects on earlier stages of child welfare involvement.
- Foster care placements are a late-stage outcome of CPS involvement. Far less is known about earlier child welfare contact, such as cases of substantiated maltreatment.
- Such cases often involve:
  - Neglect, physical abuse, sexual abuse, or psychological abuse within families
  - Parental substance use, violent behavior, and/or mental illness
  - Ongoing state monitoring but no removal
  - Surveillance and compliance plans for families with consequences for noncompliance
- RMLs may affect family behavior, reporting, or investigation practices related to substantiated findings of child maltreatment.

# Contribution

- Prior studies find declines in foster care entries post-RML (Gardner & Osei, 2022; Wallace et al., 2025).
  - These studies interpret the decline as evidence that legalization may improve family stability or reduce state intervention at the most extreme levels.
- This study focuses on substantiated maltreatment, a more common, less severe outcome.
- Suggests RMLs may shift rather than reduce state contact
  - Children may remain at home rather than in foster care due to the legal status of marijuana creating new challenges for child welfare systems to escalate cases to removal.
  - More children now live with parents who use marijuana while caregiving (Goodwin et al., 2021), which may lead to increased rates of maltreatment. Marijuana use has demonstrated associations with mental health problems (Hines et al., 2020; Rup et al., 2021; van Ours Williams, 2012), reduced motivation (Irons et al., 2014), increased fatigue (Li et al., 2022), and violent behavior (Dellazizzo et al., 2020). These may be mechanisms for increased child maltreatment.

# Hypothesis

- **Hypothesis & Suspected Mechanisms**: RMLs may increase substantiated maltreatment by:
  - Increases in cases of child maltreatment through increased disordered cannabis use
  - Increases in marginal cases of child neglect through substitution of childcare time toward leisure time. For example:
    - failing to maintain a clean, safe, and hygienic home environment
    - failing to provide consistent basic care such as administering medications, brushing children's teeth, and following through on child-specific medical recommendations
    - failing to maintain regular schedules to get children to bed and to school on time
    - failing to schedule and keep necessary appointments for medical and other services
  - Increases in cases of physical abuse due to self-regulation problems exacerbated by marijuana use (Moore & Stuart, 2005)

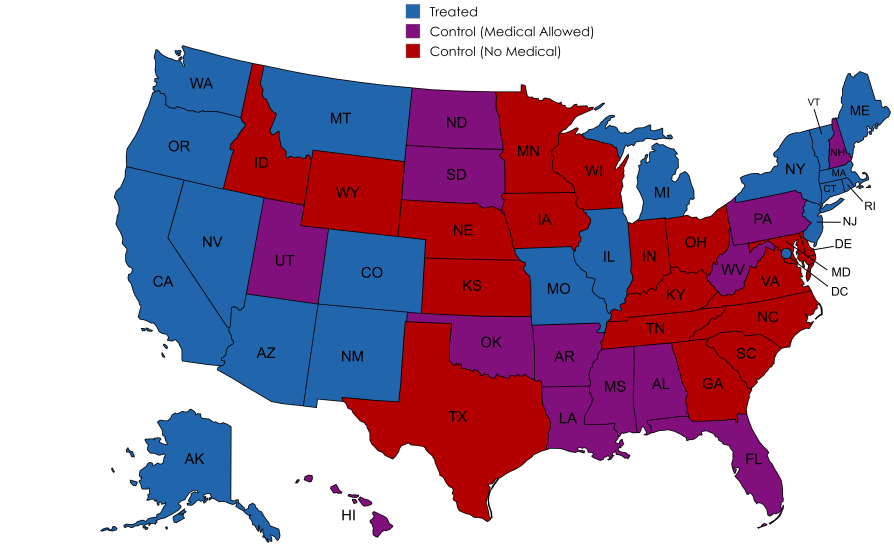
# Definitions & Research Design

→ Research question: what is the causal effect of RMLs on the incidence of substantiated child neglect cases?

- Ex-ante belief: an increase in cases of substantiated neglect.

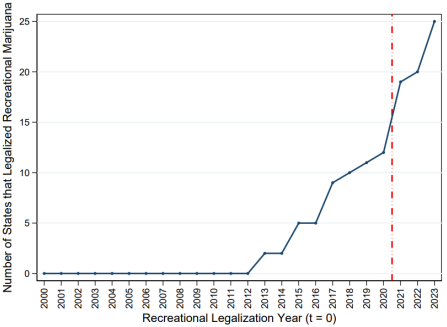
- Identification strategy: heterogeneous DiD quasi-experiment within a Rubin causal framework, comparing treated states to counterfactual control states
  - Primary source of variation: staggered adoption of RMLs by state-year
  - Policy dates adopted from seminal 2023 paper by Anderson & Rees
  - Timing precision of each policy instrument is maximized using all available information (addresses Anderson, 2014)

# Identifying Variation: End of Sample Period (2022)



# Number of Treated States by Year

(a) Number of States Treated in Each Year




(b) Cummulative Number of Treated States

Notes: The figure shows the number of states that legalized marijuana for recreational use in each year from 2000 to 2023. States that we consider treated in this analysis based on our data are those states that legalized marijuana for recreational use until 2020, while states that legalized post-2020 are not considered treated in our analysis. Panel b shows the cumulative number of states that have legalized marijuana for recreational purposes in each year up to 2023.

Source: Brown et al., 2023

# Contents

# Data & Sample Construction

- This study relies on 3 publicly available datasets:
  1. National Survey on Drug Use and Health (NSDUH), 2010-2019
     - Repeated cross-sectional state-year data
     - Representative; used to test marijuana use prevalence
     - Widely used in the literature, but effectively unavailable beyond 2019
  2. Children's Bureau Child Maltreatment Reports, 2010-2022
     - Repeated cross-sectional state-year data
     - Administrative data on child maltreatment for all states
     - Data contain aggregate counts derived from the private National Child Abuse and Neglect Data System (NCANDS) Child File, published publicly in a yearly report
  3. American Time Use Dataset, 2010-2023
     - Repeated cross-sectional state-year-individual data
     - Contains time use data used to test suspected mechanisms, such as time spent on leisure versus caring for children
     - Data are aggregated to the state-year level prior to analysis, weighted using supplied ATUS weights to maintain representativeness

# Descriptive Statistics

Table: Descriptive Statistics for Outcome Variables

| | All States | | Treated States | | Control States | |
|---|---|---|---|---|---|---|
| | Mean (1) | SD (2) | Mean (3) | SD (4) | Mean (5) | SD (6) |
| **Panel A: NSDUH (2010-2019)** | | | | | | |
| *Used marijuana in the last 30 days* | | | | | | |
| Rate, Ages 18+ | 7.5% | (2.6%) | 9.8% | (3.1%) | 6.8% | (1.9%) |
| State-year Observations | 510 | | 80 | | 430 | |
| Number of States | 51 | | 8 | | 43 | |
| **Panel B: NCANDS (2010-2022)** | | | | | | |
| *Cases of Substantiated Child Neglect* | | | | | | |
| Incidence (per 1000 children) | 9.64 | (5.36) | 11.37 | (5.51) | 8.91 | (5.13) |
| State-year Observations | 663 | | 195 | | 468 | |
| Number of States | 51 | | 15 | | 36 | |
| **Panel C: ATUS (2010-2023)** | | | | | | |
| *Time Spent Caring for Household Children* | | | | | | |
| Minutes per day | 76.1 | (25.3) | 78.9 | (26.7) | 74.1 | (24.1) |
| State-year Observations | 663 | | 260 | | 403 | |
| Number of States | 51 | | 20 | | 31 | |

# Primary Empirical Model: Sun & Abraham

$$Y_{st} = \delta_0 + \sum_{e \notin C} \sum_{\substack{l=-4 \\ l \neq -1}}^{4} \delta_{e,l}(\mathbb{1}\{E_s = e\} \times RMD^l_{s,t}) + \delta_2 MML_{st} + \delta_3 MJDecrim_{st} + ...$$

$$... + X'_{st}\delta_4 + \alpha_s + \gamma_t + \epsilon_{st} \quad (1)$$

- $\mathbb{1}\{E_s = e\}$: is an indicator function where $e$ represents each treated cohort by year of treatment in the support set of all treated cohorts $E_s$
- $RMD^l_{s,t}$: indicator for treatment status in a given relative year, state, and calendar year
- $\delta_{e,l}$: Coefficients of interest, the CATT of dispensaries opening on $Y_{st}$ within each relative year in the data
  - Two additional steps follow this equation: balancing/weighting on relative year (see Sun & Abraham, 2021)
- $X'_{st}$: Vector of state-year controls (demographics, beer/cig tax, macro)

# Primary Empirical Model: Comparison to Canonical TWFE

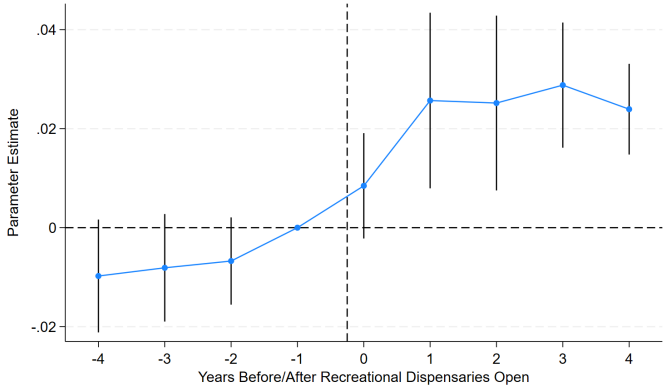
Table: Comparison of TWFE and Sun & Abraham Estimators

| Concept | What's Included in Estimation | Effect Estimated From | What it Estimates |
|---|---|---|---|
| TWFE (Summary Estimate) | All units. Pre-treatment periods for treated states are included in control mean. | Differences in pre vs. post, across all units (incl. early vs late) | Average Treatment Effect on Treated (ATT) |
| Sun & Abraham (Event Study) | Select units. Pre-treatment periods are excluded from control mean. | Only post-treatment differences for each cohort vs. never-treated | Event-time-specific CATTs |
| Sun & Abraham (Summary Estimate) | Average of post-treatment CATTs | Only post-treatment differences for each cohort vs. never-treated | ATT that is consistent with TWFE conceptually, but free from timing bias |

# Contents

# Findings: Adult Marijuana Use (NSDUH 2010-2019)

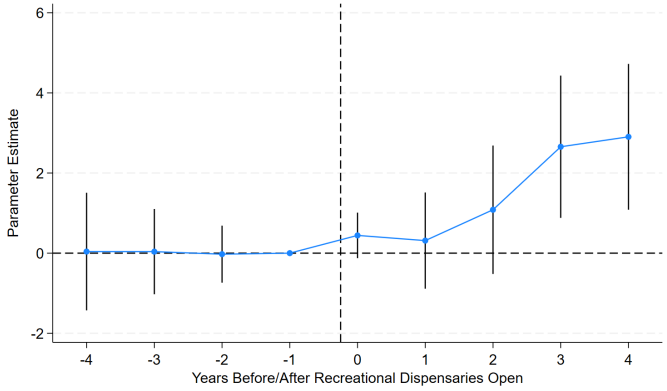
Figure: Event Study, RML with dispensaries on prevalence of adult marijuana use (ages 26+)




Average Treatment Effect on Treated: 0.022***
Pre-treatment mean at $l = -1$: 0.101
Effect size: 21.8% increase

# Findings: Substantiated Maltreatment (NCANDS 2010-2022)

Figure: Event Study, RML with dispensaries on total cases of substantiated child maltreatment (per 1,000 children aged 0-17)

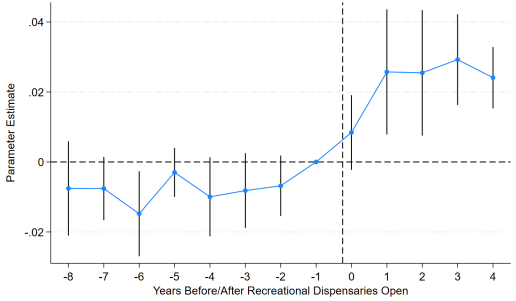



Average Treatment Effect on Treated: 1.48*** cases
Pre-treatment mean at $l = -1$: 10.9 cases
Effect size: 13.4% increase

# Findings: Extended Pre-periods

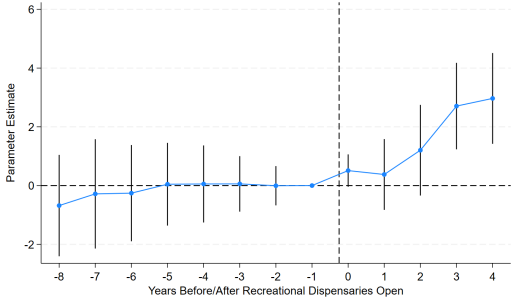
Figure: Extended event studies for main outcomes

A: Prevalence of any prior-month marijuana use (ages 26+)




Data are from the 2010-2019 NSDUH

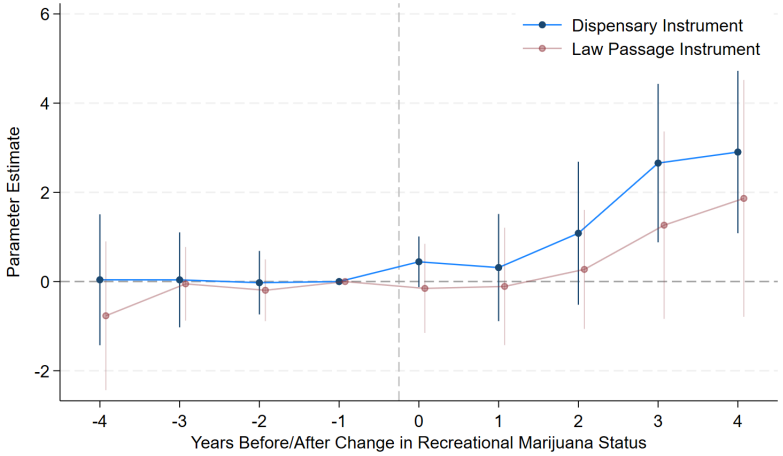
B: Total cases of substantiated maltreatment (per 1,000 children)




Data are from the 2010-2022 NCANDS

# Alternative Estimation: Replicating Competing Study (NCANDS 2010-2022)

Figure: Event Study, RML on total cases of substantiated child maltreatment (per 1,000)



# Findings: Heterogeneity by Maltreatment Type (NCANDS 2010-2022)

Table: Estimates for effects of RML with recreational dispensaries on substantiated child maltreatment by type (per 1,000)

| | (1) Neglect | (2) Physical Abuse | (3) Sexual Abuse | (4) Psychological Abuse | (5) Medical Neglect |
|---|---|---|---|---|---|
| **Cases (per 1,000)** | | | | | |
| *RML with dispensaries* | 1.20** | 0.48** | 0.04 | -0.16 | 0.11*** |
| | (0.48) | (0.20) | (0.04) | (0.16) | (0.04) |
| Control Mean | 5.71 | 1.80 | 0.92 | 0.97 | 0.25 |
| Effect Size | 21% | 27% | - | - | 44% |
| State-year Observations | 593 | 593 | 592 | 552 | 476 |

* $p < 0.10$ , ** $p < .05$ , *** $p < .01$.

*Notes:* Each column represents a separate regression. Results are derived using Sun and Abraham's (2021) dynamic treatment effect estimator to account for timing-induced bias. Coefficient represents the change in substantiated cases of child maltreatment by type per 1,000 state population of children aged 0 to 17. Data are from the 2010-2022 Children's Bureau reports. All regressions include state and year fixed effects. Standard errors, clustered at the state level, are in parentheses.

# Findings: Heterogeneity by Child's Age (NCANDS 2010-2022)

Table: Estimates for effects of RML with recreational dispensaries on unique child victims by age (per 1,000)

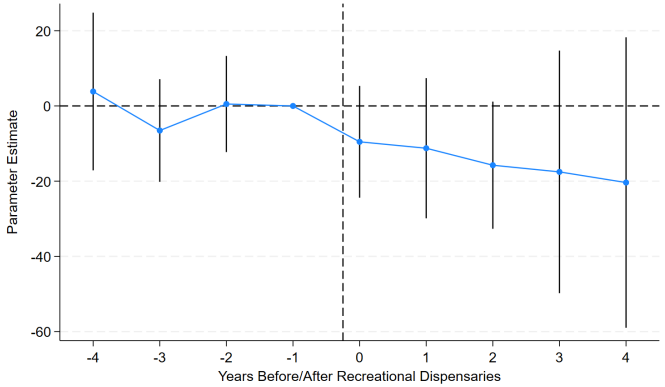
| | (1) Ages 0-3 | (2) Ages 4-7 | (3) Ages 8-11 | (4) Ages 12-15 | (5) Ages 16-17 |
|---|---|---|---|---|---|
| **Cases (per 1,000)** | | | | | |
| *RML with dispensaries* | 0.42** | 0.34*** | 0.27*** | 0.28*** | 0.14*** |
| | (0.19) | (0.13) | (0.10) | (0.09) | (0.04) |
| Control Mean | 2.90 | 2.02 | 1.65 | 1.50 | 0.50 |
| Effect Size | 14.5% | 16.8% | 16.4% | 18.7% | 28% |
| State-year Observations | 593 | 593 | 593 | 593 | 593 |

* $p < 0.10$ , ** $p < .05$ , *** $p < .01$.

*Notes:* Each column represents a separate regression. Results are derived using Sun and Abraham's (2021) dynamic treatment effect estimator to account for timing-induced bias. Coefficient represents the change in substantiated cases of child maltreatment by age group per 1,000 state population of children aged 0 to 17. Data are from the 2010-2022 Children's Bureau reports and include all cases of substantiated child maltreatment. All regressions include state and year fixed effects. Standard errors, clustered at the state level, are in parentheses.

# Findings: Time Use (ATUS 2010-2023)

Figure: Event Study, RML with dispensaries on time spent caring for household children (by caretakers aged 26+ of children aged 0-17)




Average Treatment Effect on Treated: -14.9* minutes per day
Pre-treatment mean at $l = -1$: 87.9 minutes per day
Effect size: 17% decrease

# Contents

# Discussion

- This study finds an increase of 1.76 cases of substantiated maltreatment per 1,000 state population of children ages 0-17 after recreational marijuana dispensaries open.
  - Statistically significant increases in rates of neglect, physical abuse, and medical neglect
  - A potential mechanism: Parents spent 8.3% more time per day relaxing, and 14.3% less time caring for children

- Parents' increased use of marijuana after RML implementation appears to lead to declines in parental functioning. There may be various mechanisms related to marijuana's impacts on parents' mental and physical health, emotional regulation, ability to supervise children, and attention to children's care needs.
- Legal status may impede child welfare workers' ability to intervene, so children remain in neglectful or abusive home conditions for longer.

# Conclusion

- The opening of recreational marijuana dispensaries leads to increased marijuana use among parents of children under 18, and contributes to increased rates of substantiated child maltreatment.

- Further study is urgently needed to clarify specific mechanisms and processes showing how increased marijuana use impacts parental functioning.
- Researchers and policymakers should develop new risk assessment frameworks for child welfare systems to more effectively intervene in the new landscape of legal recreational use in family settings.