

# **DID TOBACCO 21 LAWS AFFECT CIGAR SALES?**

## **EVIDENCE FROM SURVEY AND SALES DATA**

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**Tobacco Online Policy Seminar**  
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**TCORS 2.0**

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Georgetown  
University

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**Assessment of Tobacco  
Regulations**  
**[CAStoR]**

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- I perform consulting work for the World Health Organization and Johns Hopkins University
- The opinions expressed here are my own and do not represent those of my funder and employers, past or present, or those of my co-authors

# The Confession of a Self- Doubting American

Is it a good idea to export  
an American policy to the  
rest of the world?



**Background**

## Tobacco 21 - What is it?

- Tobacco 21 makes it illegal for a retailer to sell a tobacco product to someone under 21 years old
  - Minimum Legal Sale Age to 21
- First adopted in Needham, Massachusetts, in 2005
- New York City adopted in 2014
- Similar, not the same as rules around alcohol

# Tobacco 21- Policy Diffusion

- 2015 Institute of Medicine report estimated a US federal T21 policy would avert 250K premature deaths
  - Rapid diffusion across cities and states followed
- Led to US Federal Tobacco 21 policy in December 2019
- Philippines and Singapore followed afterward
  - Prince Edward Island, CA too
- Sri Lanka, Honduras, Mongolia, Uganda, and Ethiopia had Tobacco 21 laws predating the US

## Tobacco 21 - Policy Effects

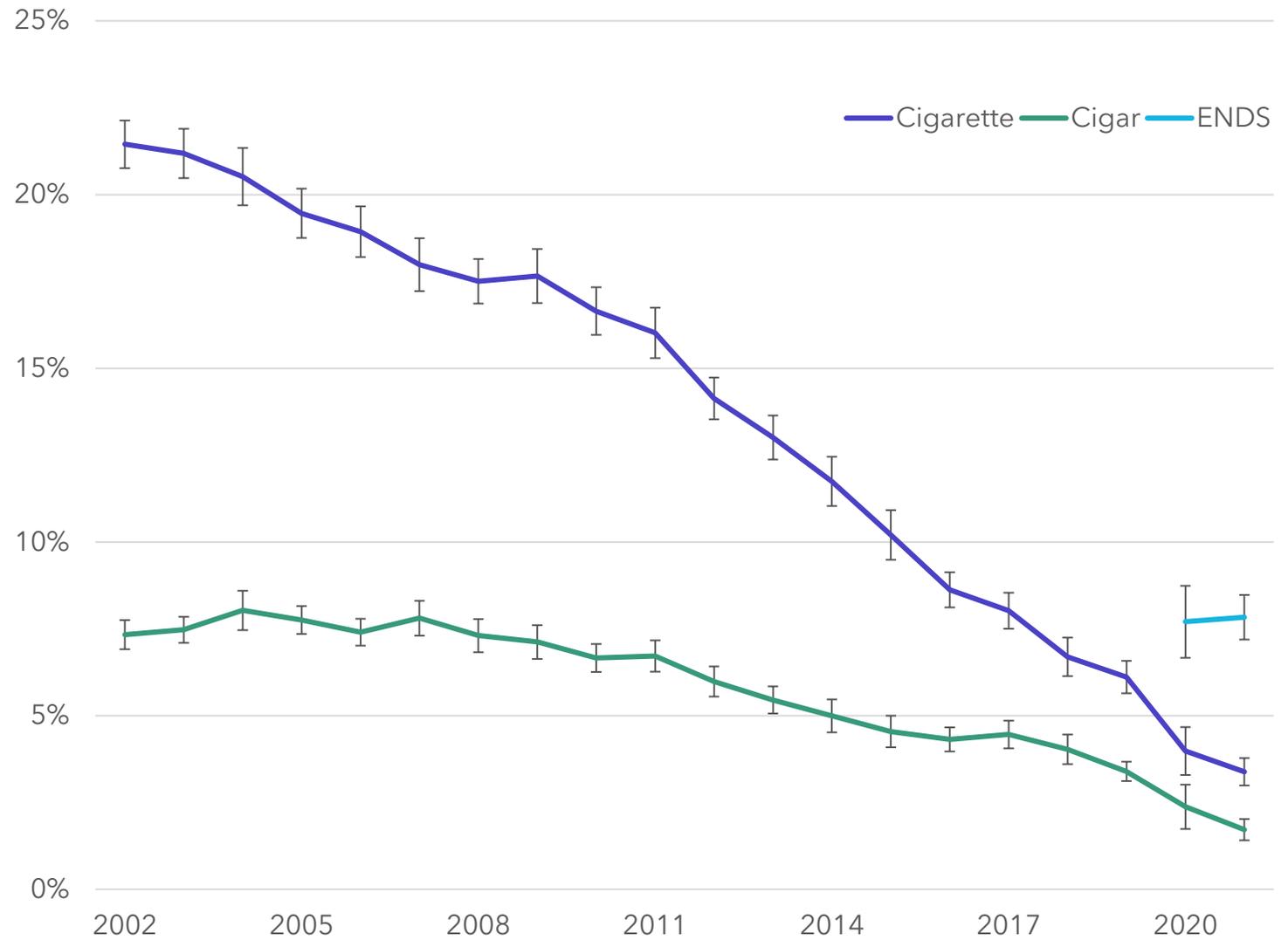
- Decrease cigarette smoking
  - Positive to Mixed
- Decrease e-cigarette use
  - Positive to Mixed
- Decrease sales of cigarettes used by young people

## Tobacco 21 - Effects on Cigar Use

- Sales of cigars declined faster after T21 in Hawaii vs California<sup>1</sup>
- Cleveland, OH students were less likely to report smoking cigars after T21 adoption<sup>2</sup>
- Little else...

<sup>1</sup>doi:10.1136/tobaccocontrol-2019-055248 <sup>2</sup>doi:10.1001/jamanetworkopen.2022.22987

# Past Month Usage by Product (US, 12-20-Year-Olds, NSDUH)



What Cigars do Young People Smoke?

- Use NSDUH data to calculate which brands are consumed by Under 21s

Where were T21 laws put into place?

- Collect data from Colston et al, 2021, CDC-STATE, and Tobacco21.org on T21 details and population coverage

Did T21 laws decrease sales of cigars?

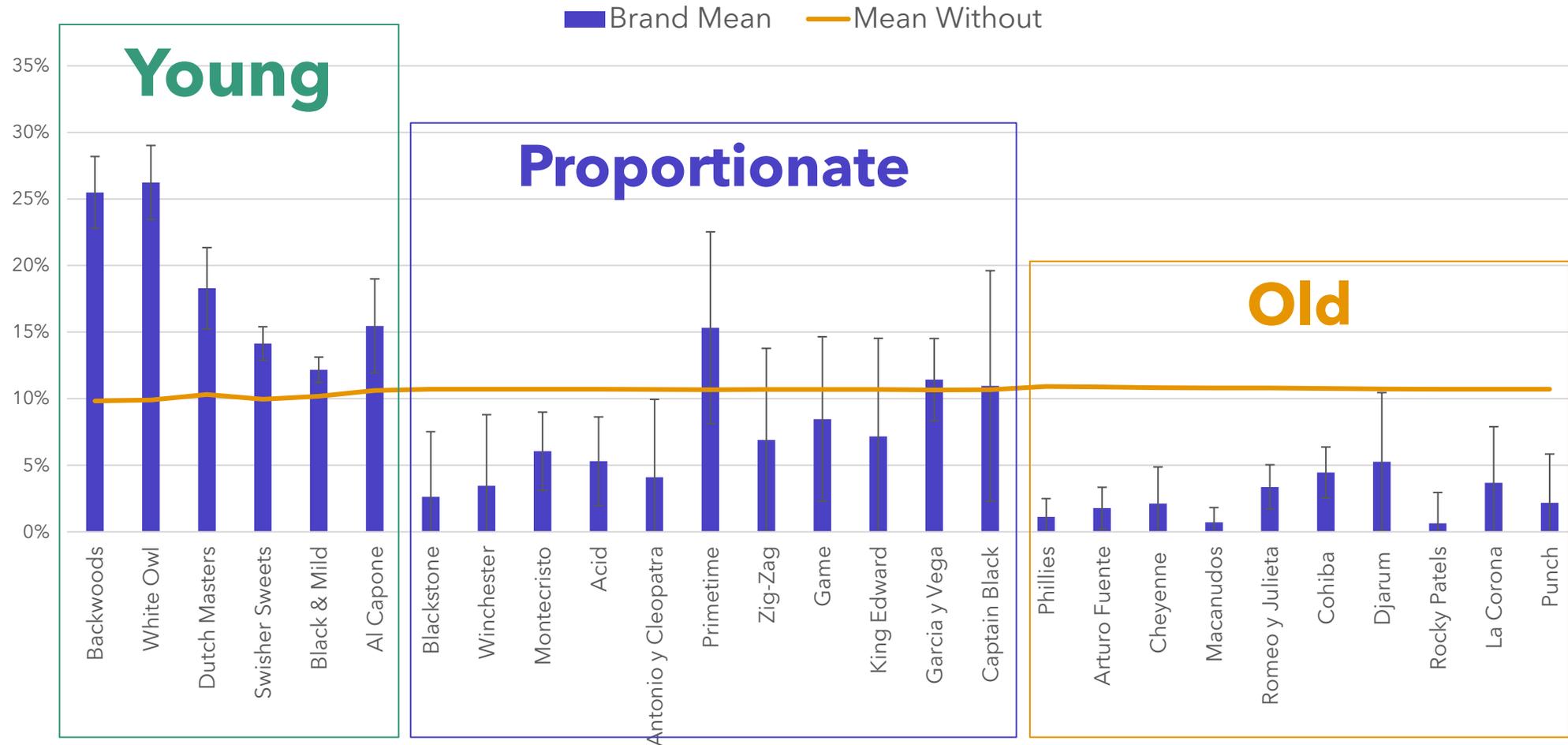
- Difference-in-Differences analyses of T21 by brand groups and flavor divisions

**Methods + Data**

# What Cigars do Young People Smoke?

- National Survey of Drug Use and Health
- Multiplied Usage Days in the Past 30 by Final Respondent Weight to create a "Consumption" Weight
- Calculated the Proportion of Total and each Brand of Cigar-days assigned to persons under the age of 21
- Assigned brands across 2014-2019 results

# Cigar Brand Under 21 Consumption Shares (NSDUH, 2014-2019)



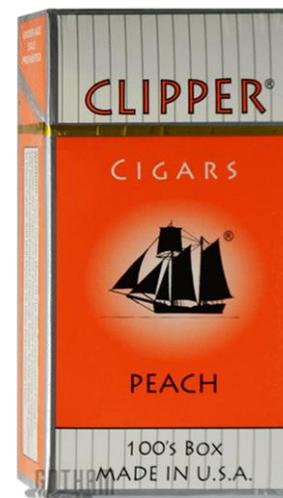
# Young Brands



# Proportionate Brands



# Old Brands



# When and where were T21 laws put into place?

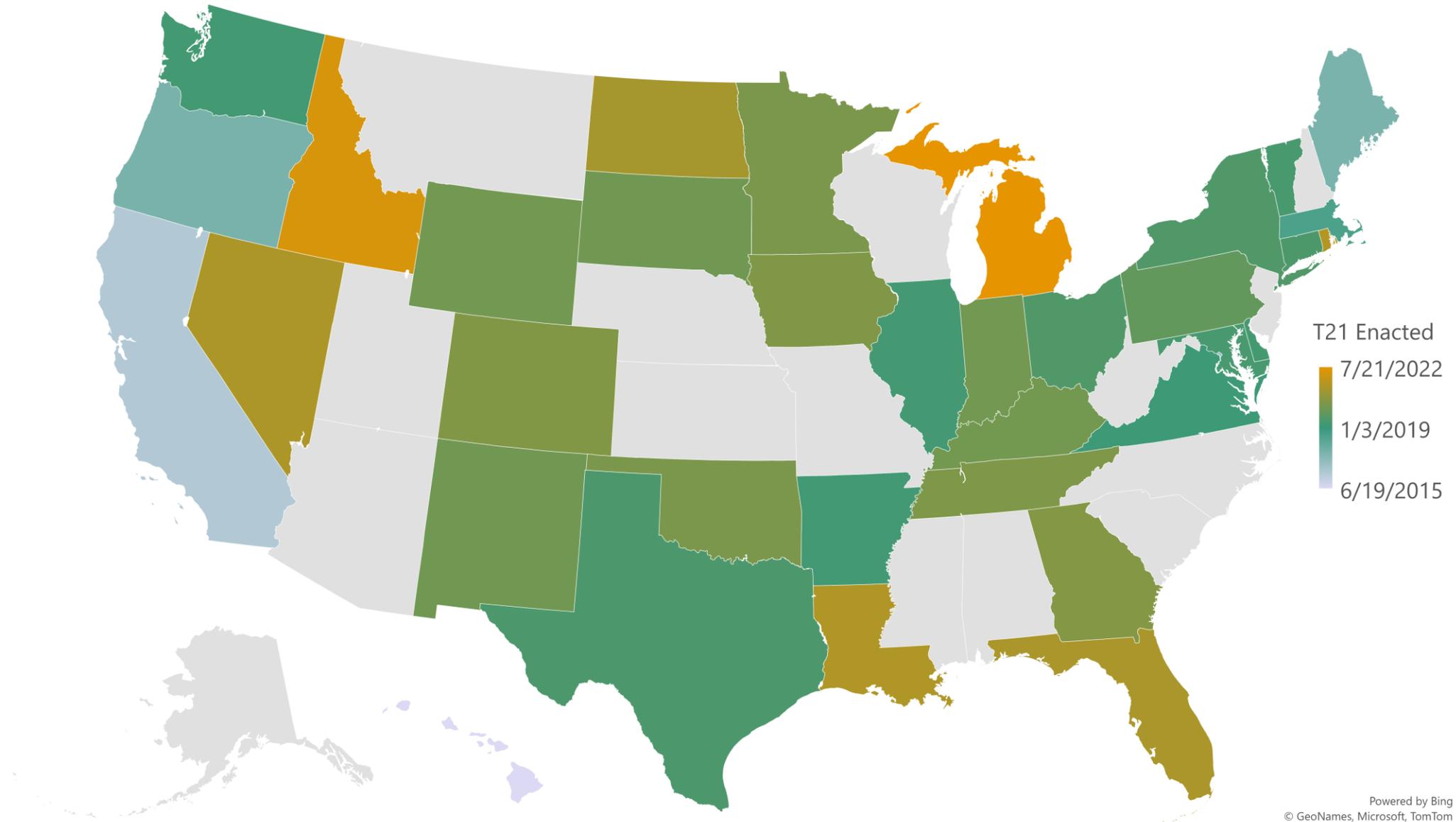
- Colston et. al, 2021<sup>1</sup>, measuring substate T21 policy coverage from January 2015–December 2019
- CDC STATE database documenting state-level T21 enactment and implementation dates
  - Note grandfathering and pre-existing T19 policies
  - Documents post Federal T21 policy adoption
- Requires piecing together a complex policy implementation database

# US Federalism Layer Cake

- T21 laws have been passed at federal, state, and local levels
- All have different enforcement powers, responsibilities, and funding



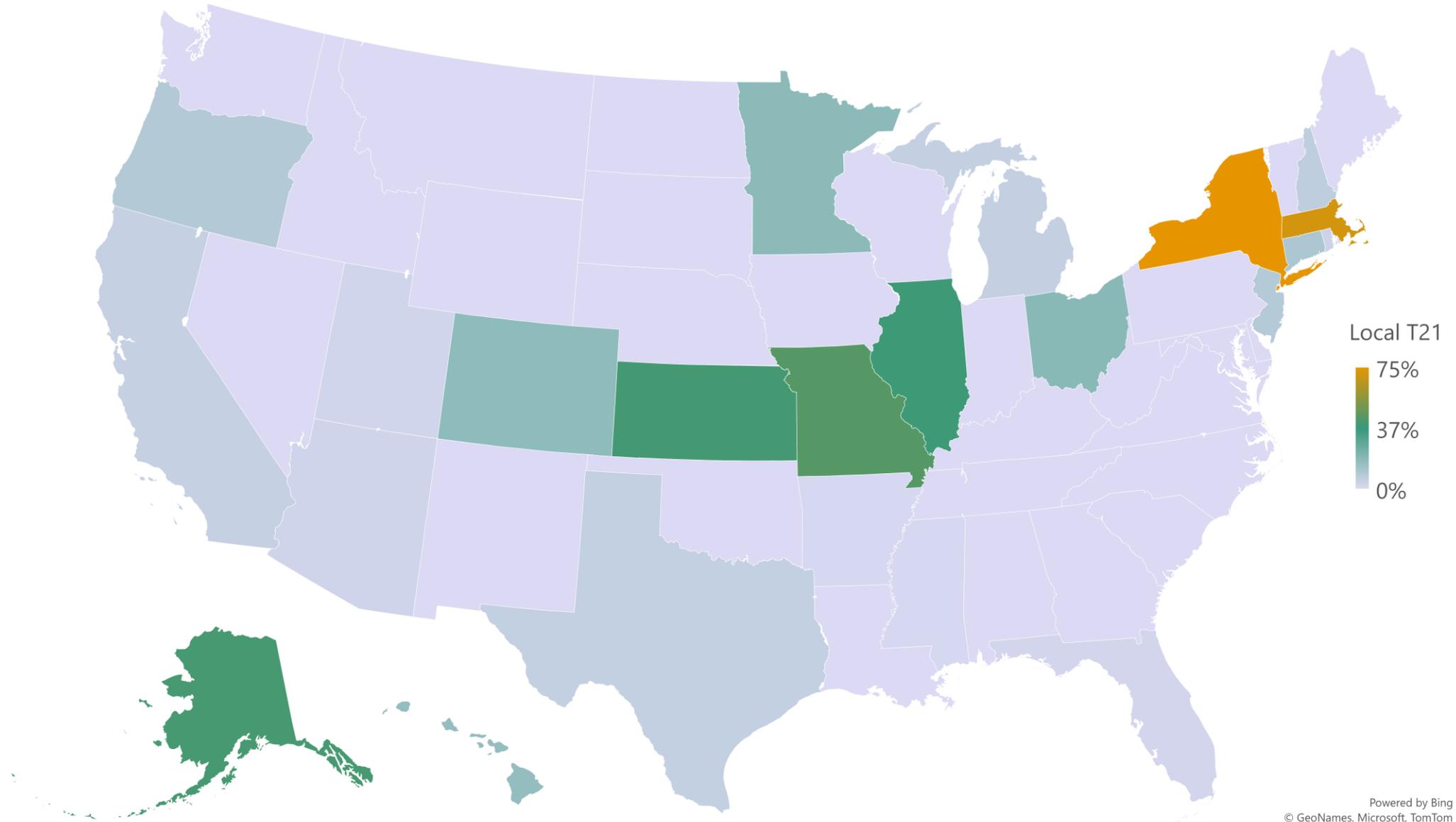
# State Tobacco 21 Enactment Date







# Local T21 Population Coverage Before State Laws - Colston et al.



# When Did Federal T21 Go Into Effect?

Dec 2019

- Law Signed

Mar 2020

- Rule Progress Report Due (Missed)

Aug 2021

- Under 18 Charges Stop

Feb 2020

- First Under 21 Charges

Jun 2020

- Rule Delay Justification (Missed)

Mar 2022

- Kaine Letter Asks FDA For Final Rule

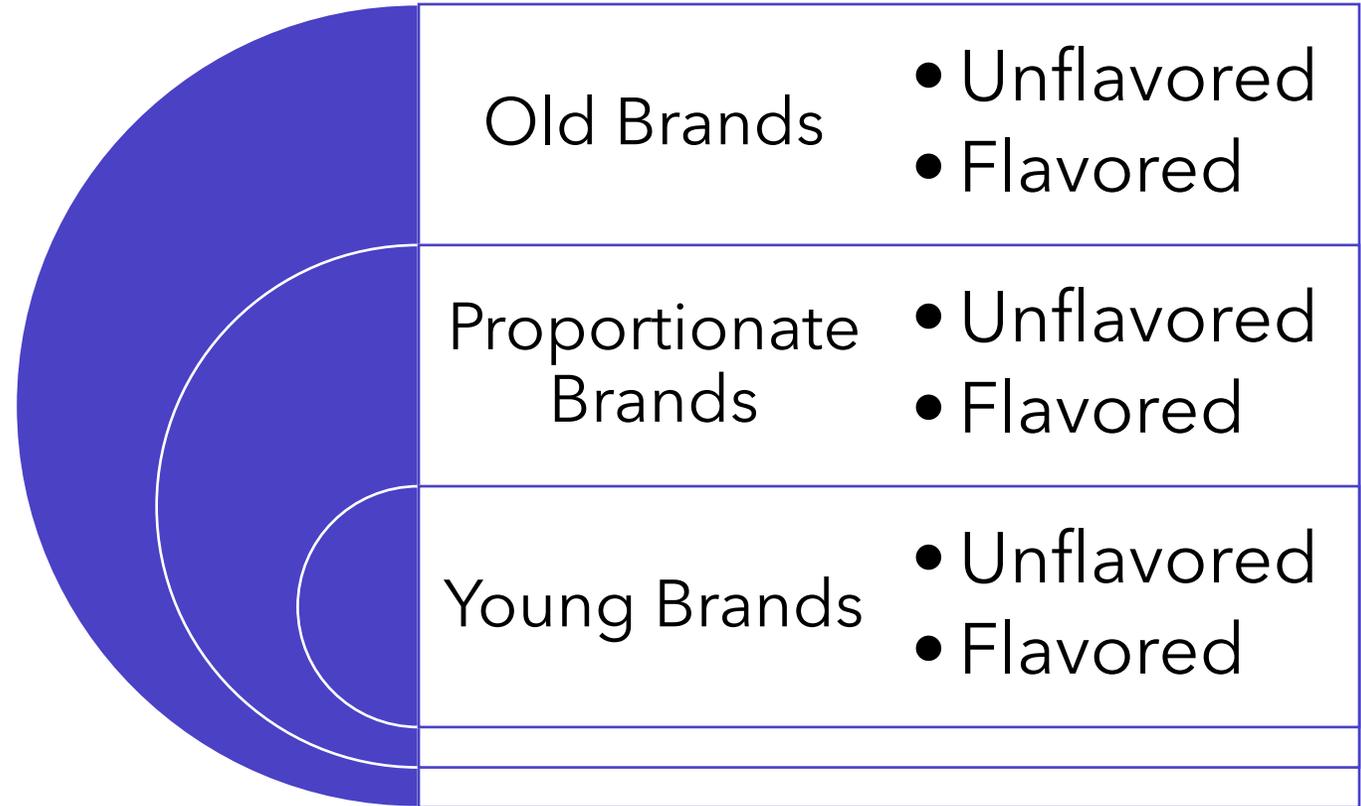
# When Did Federal T21 Go Into Effect?



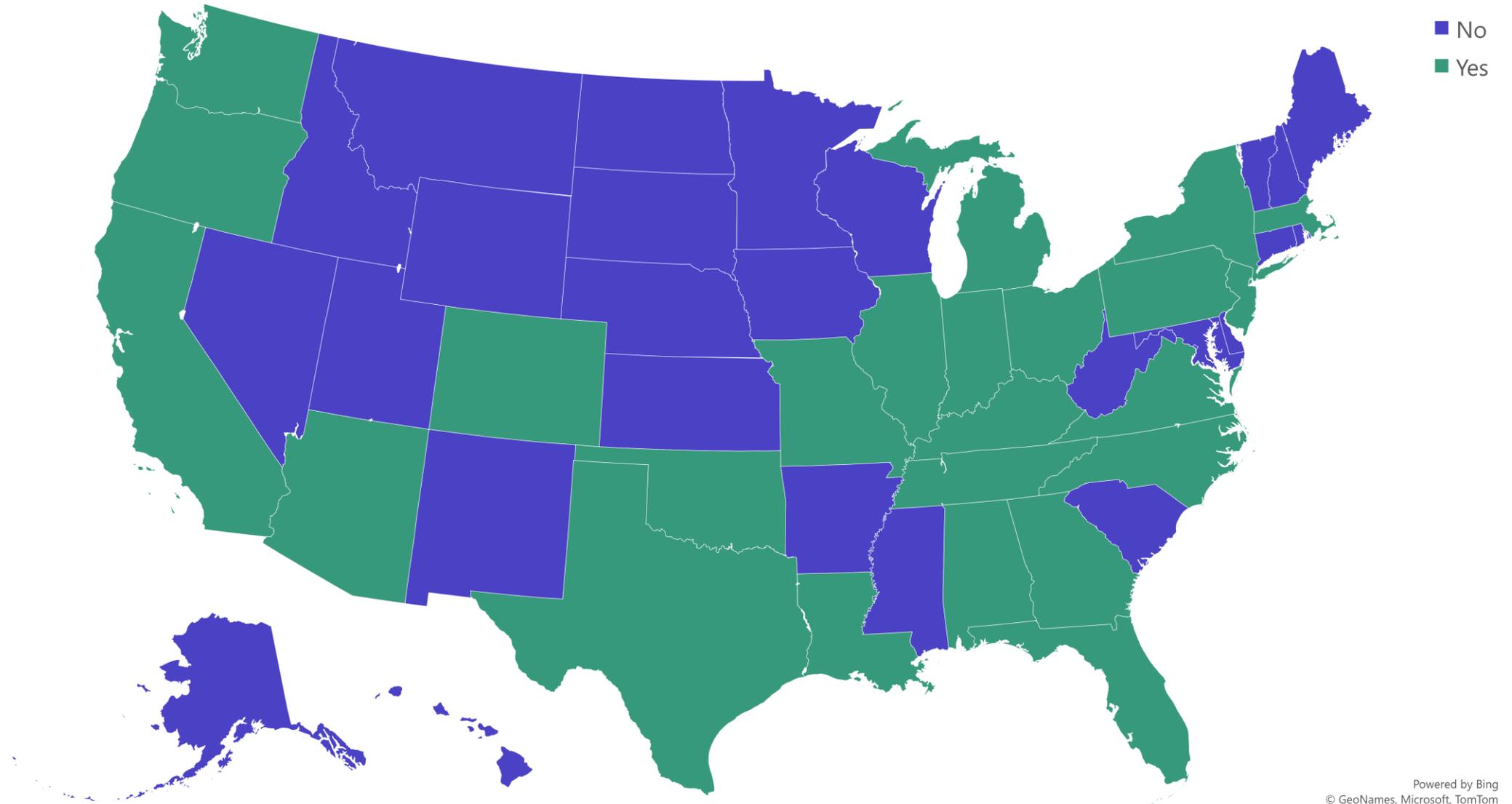
- State T21 Enforcement Date → Used for Event Study
- Local T21 Population Policy Coverage
- State T19 and T20 laws
- State T21 Enactment but not Enforcement
- Federal T21 → Equal to state population uncovered by state or local law
  - After Dec 2019 - Signed
  - After Jun 2020 - Rule
  - After Aug 2021 - Inspection

# Nielsen Data

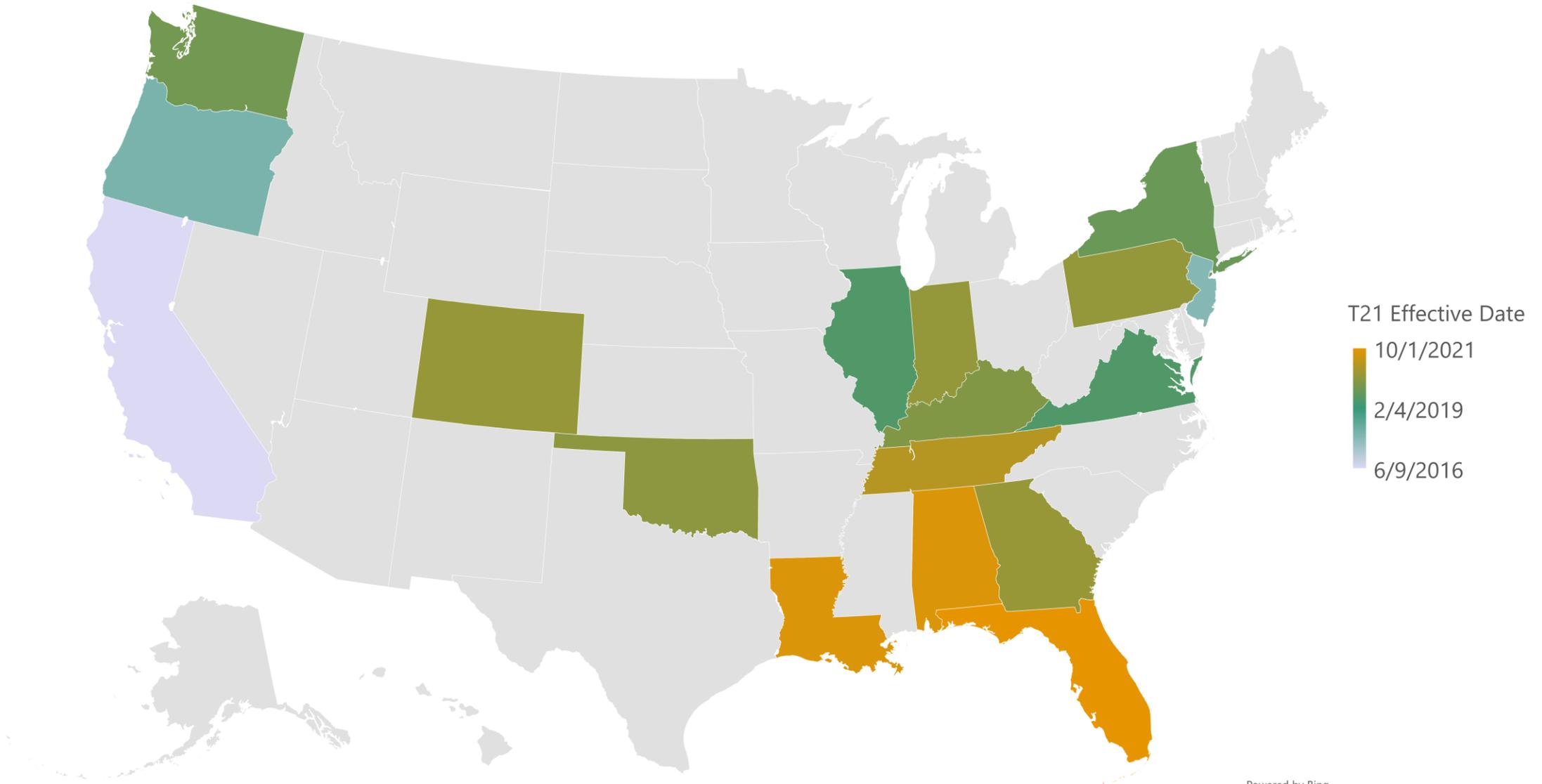
- Logged Per Capita Standard Unit sales of **cigars** in 24 US states: Jan 2017 - Nov 2021
- Nielsen Scantrack
  - Convenience, Food, and Drug
  - Excludes Online, Vape Shop, and Tobacconists



# Nielsen ScanTrack Conv+xAOC States



# Nielsen State T21 Laws in Study Period



# Additional State Control Variables

## Extra Tobacco Control

- Percent Covered by a ban on the sale of flavored cigars
- Cigarette excise taxes
  - (\$ per pack)
- Cigar excise taxes
  - (\$ per stick; % of price)
- ENDS excise taxes
  - (\$ per Juul pod standardized by Cotti et al., 2021)
- Percent covered by a workplace smoking ban

## Policy and Environmental Variables

- Recreational Marijuana Sales Legal
- Medical Marijuana Sales Legal
- Unemployment Rate
- Heating Degree Days

# Analytic Methods

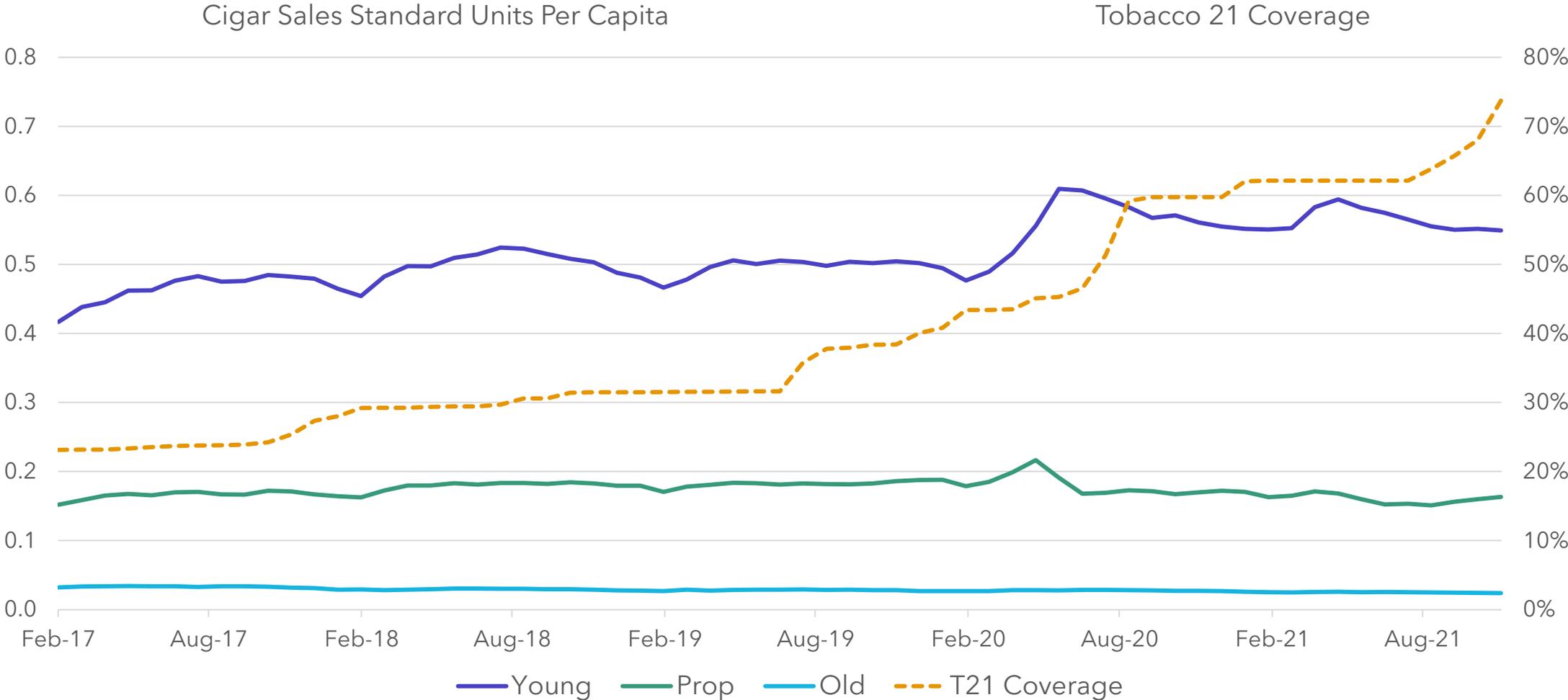
- Estimate Difference-in-Difference (DID) estimators
  - Multiple groups, staggered potentially non-binary treatments
  - Introduced in de Chaisemartin and D'Haultfoeuille, 2020
- Enables causal estimates if parallel trends are established
- Dependent Variable: Logged Per Capita Unit Sales
  - Split by Age Group (Young, Proportionate, Old)
  - Total and stratified by Flavor (Flavored, Unflavored)
- Stata Command `did_multiplegt_dyn`
  - 6 Placebos and 12 Treatments

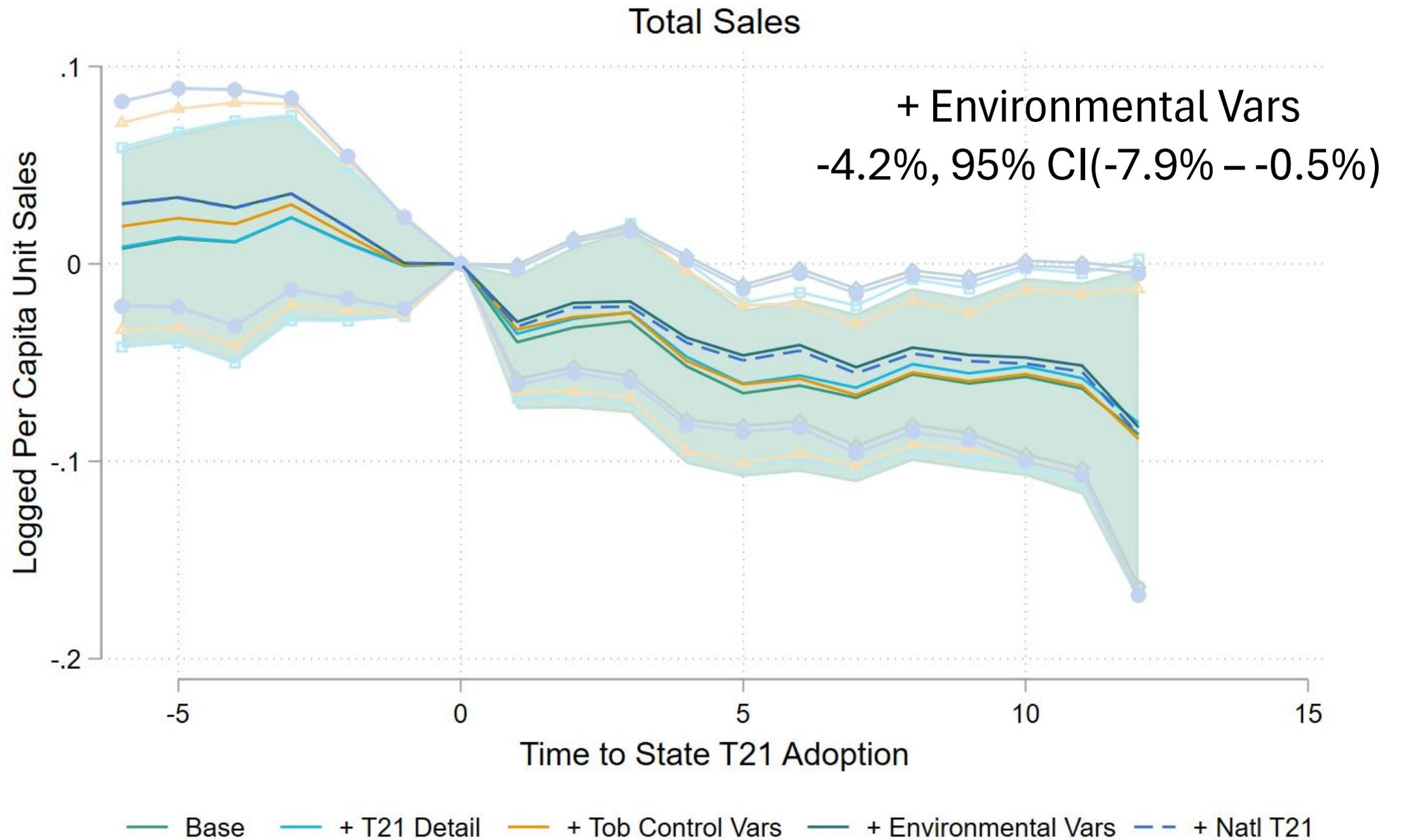
# Question Break



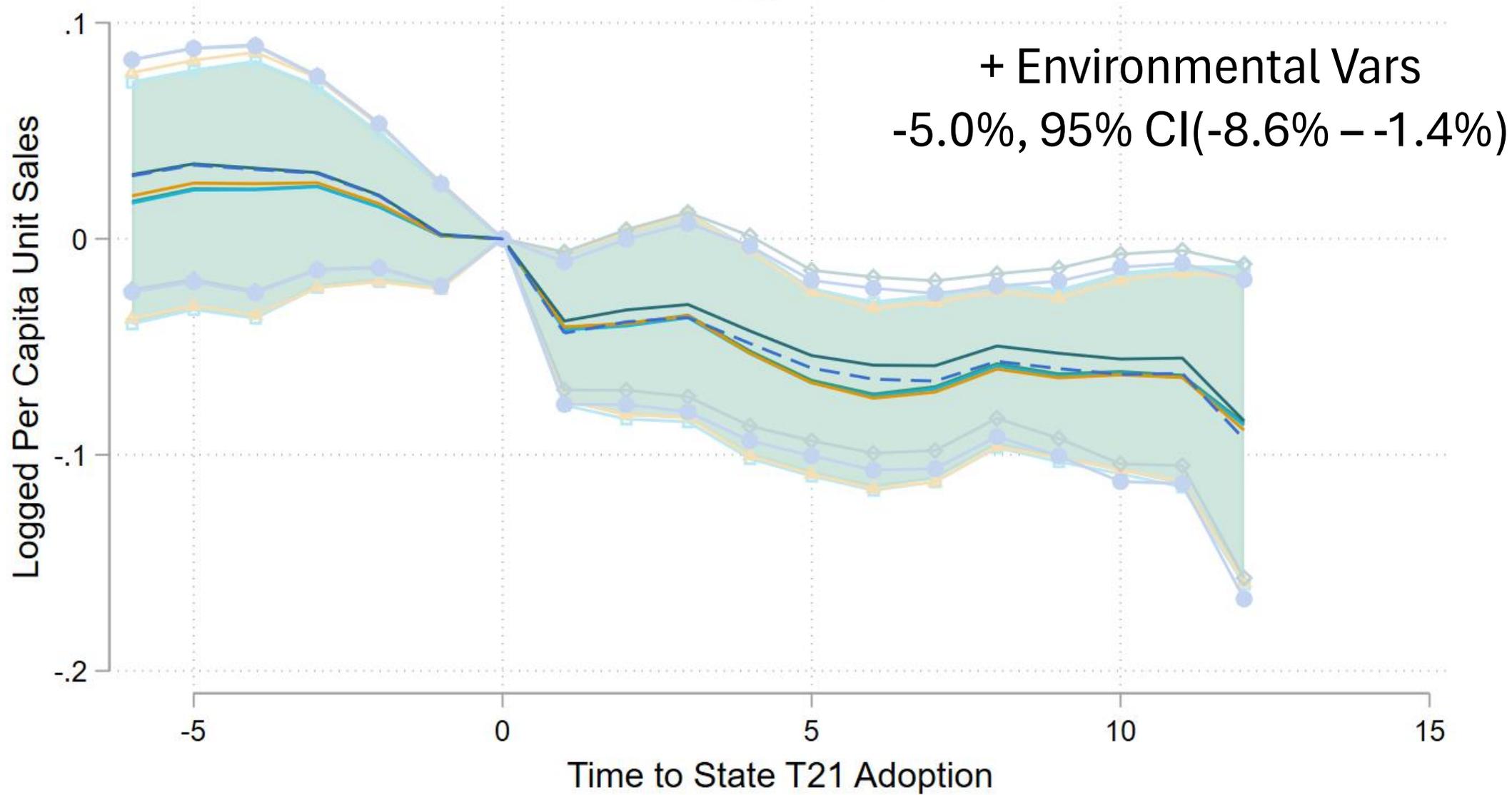
# Results

# Descriptive Statistics (Four Week Periods Ending 2/4/17 -11/6/21)

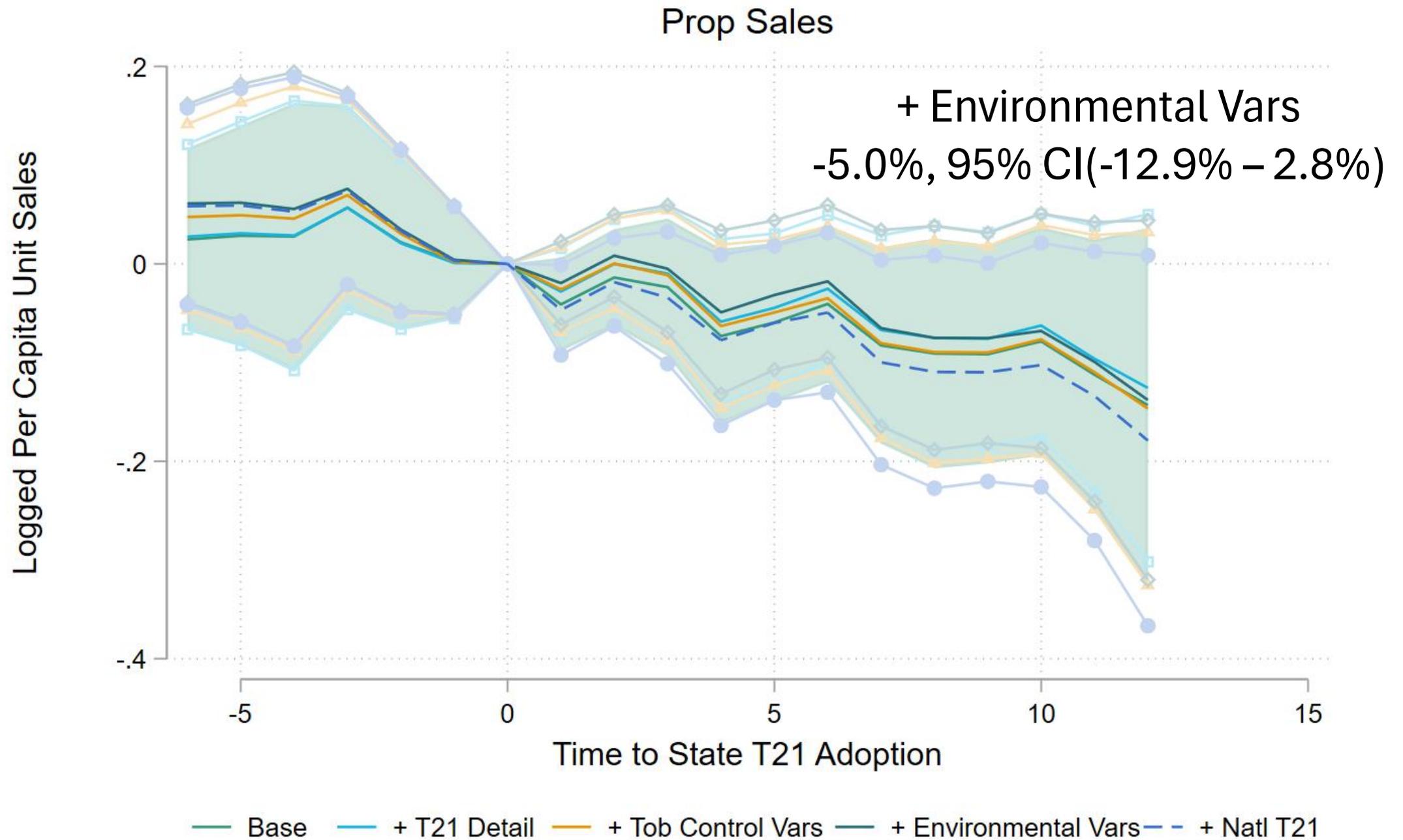


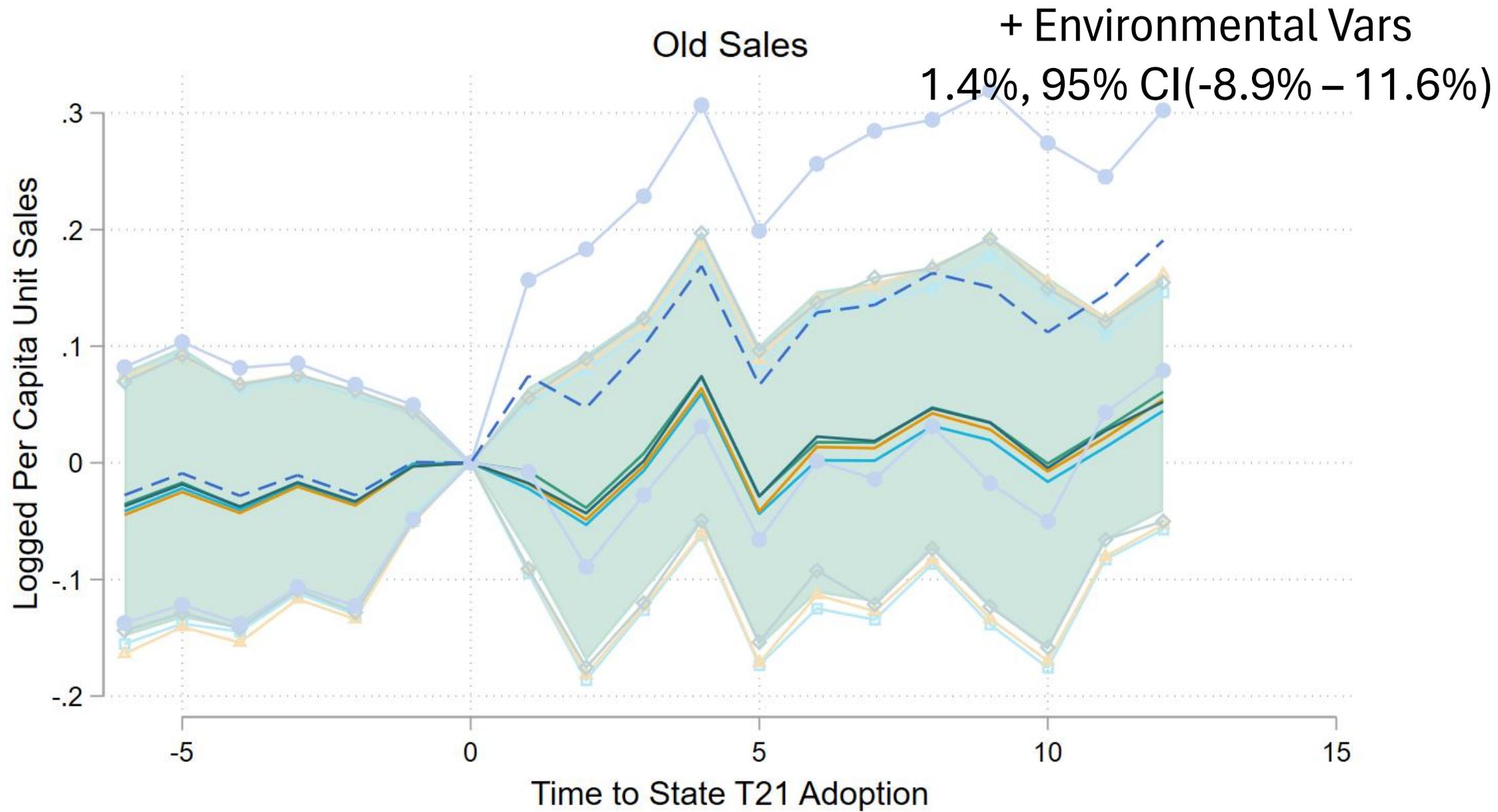


# Young Sales

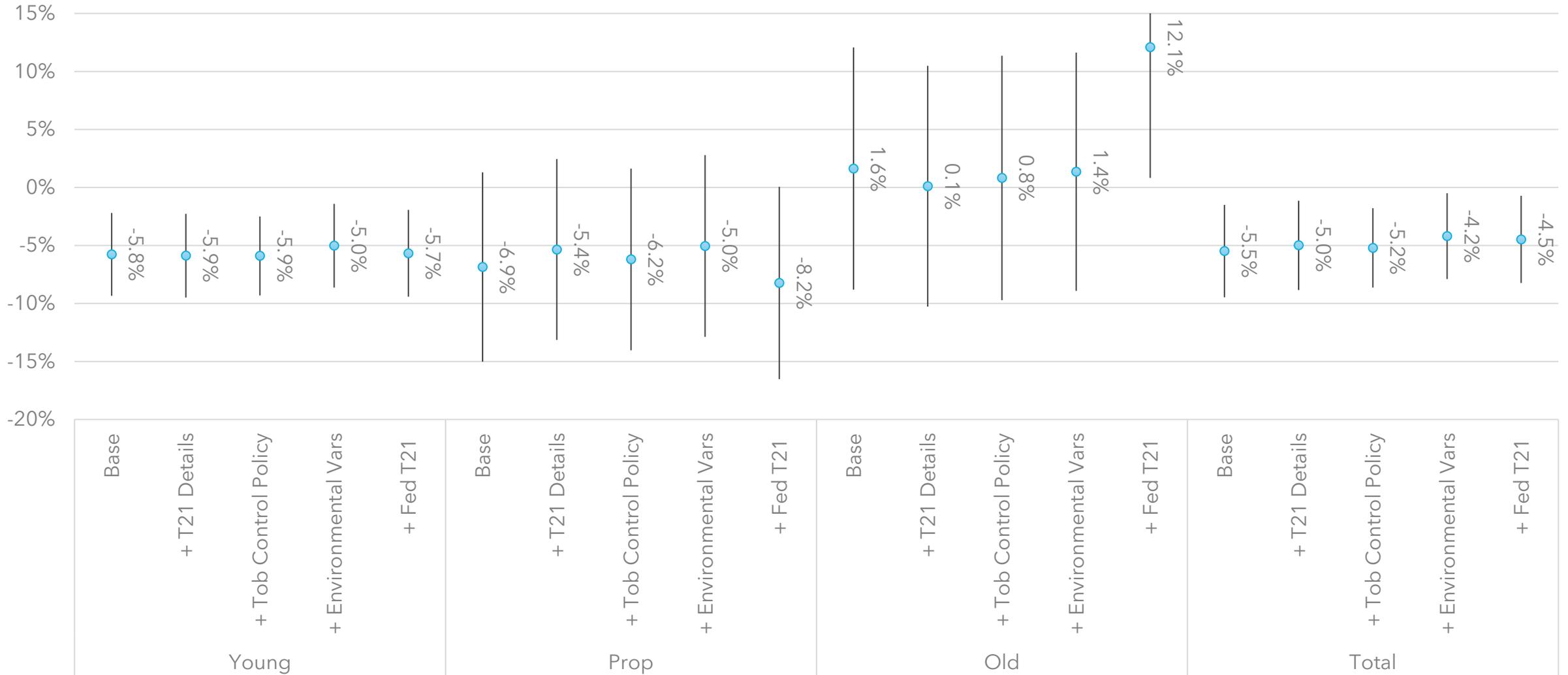


— Base    — + T21 Detail    — + Tob Control Vars    — + Environmental Vars    - - - + Natl T21

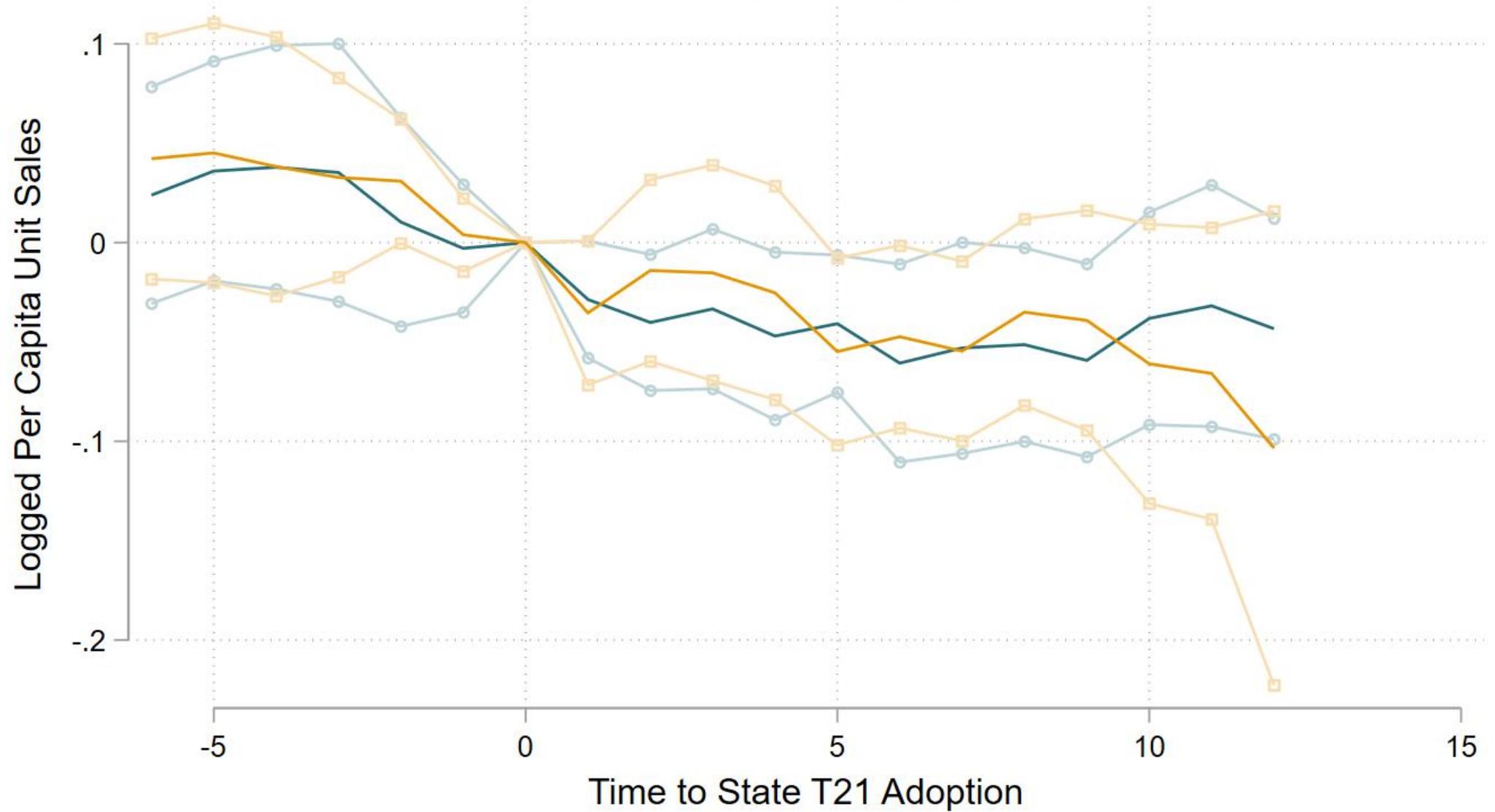




# State T21 Average Policy Effects - Logged PC Standard Unit Sales

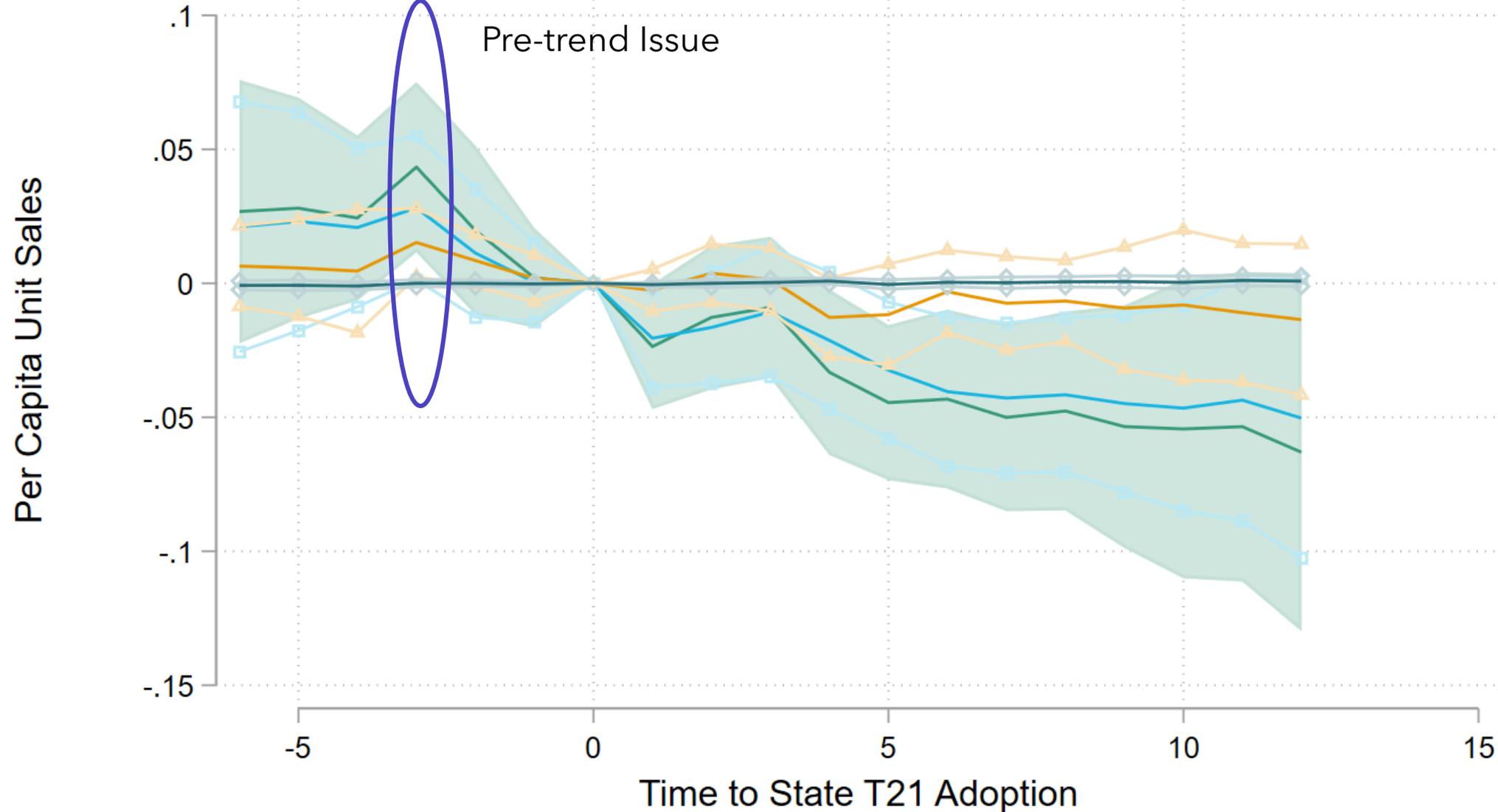


# T21 and Sales Full Model



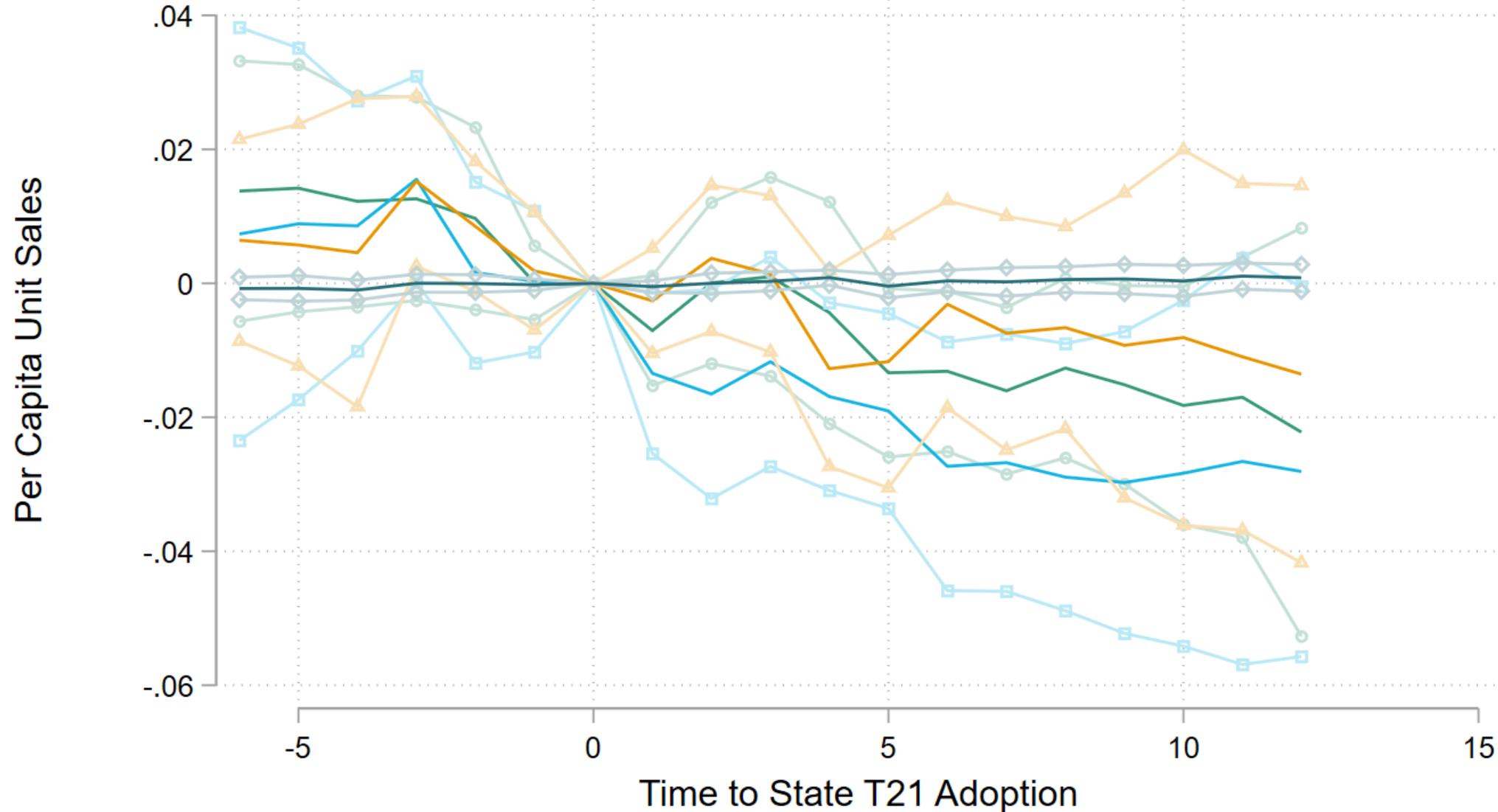
-4.4%, 95% CI(-8.1% – -0.6%)    Young Unflavored    Young Flavored    -4.5%, 95% CI(-8.8% – -0.1%)

# Sales



— Total    — Young    — Prop    — Old

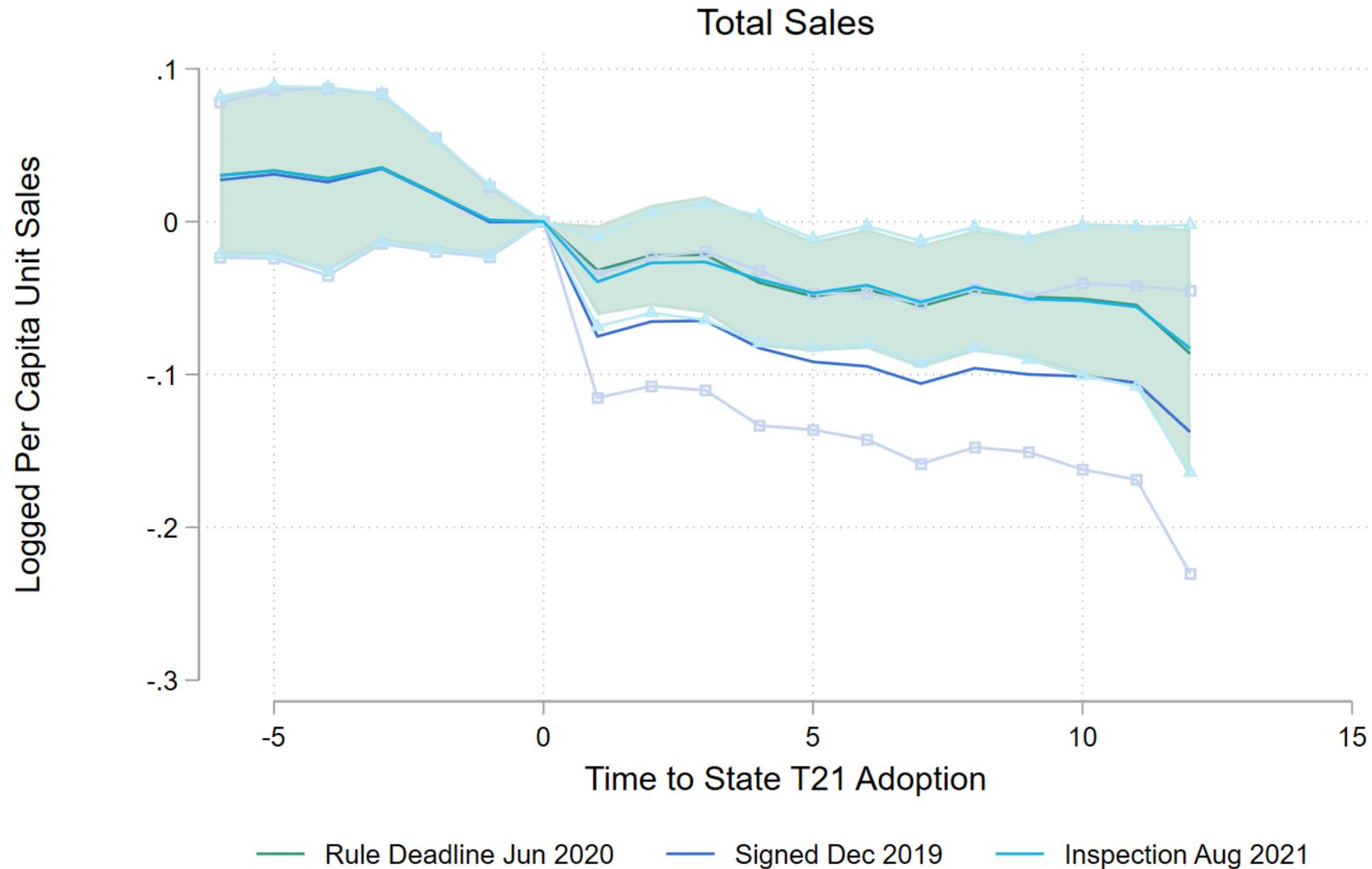
# Sales



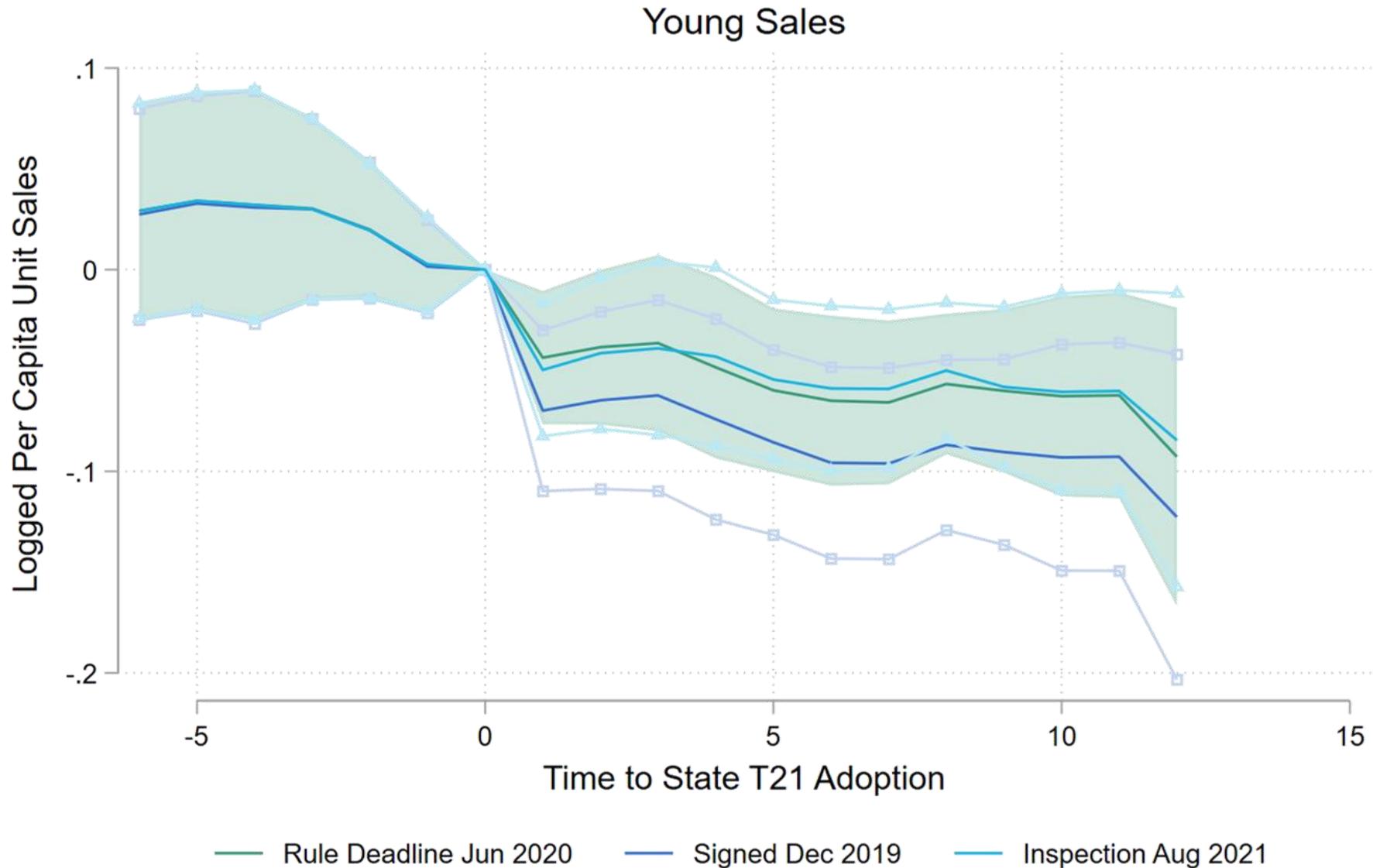
— Young Flavored    — Young Unflavored    — Prop    — Old

# **Sensitivity Checks**

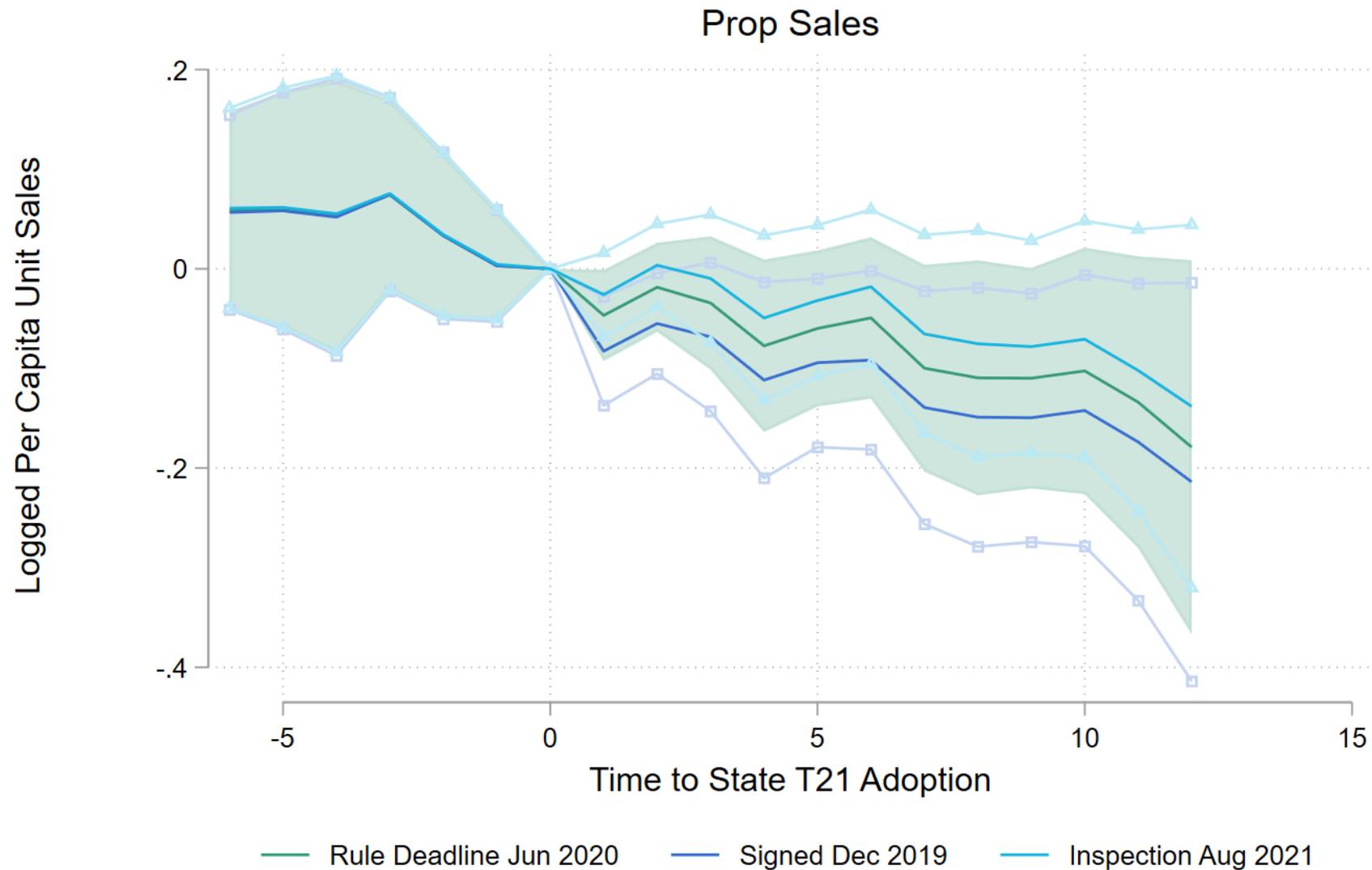
# Sensitivity check: National T21 Dates and Total



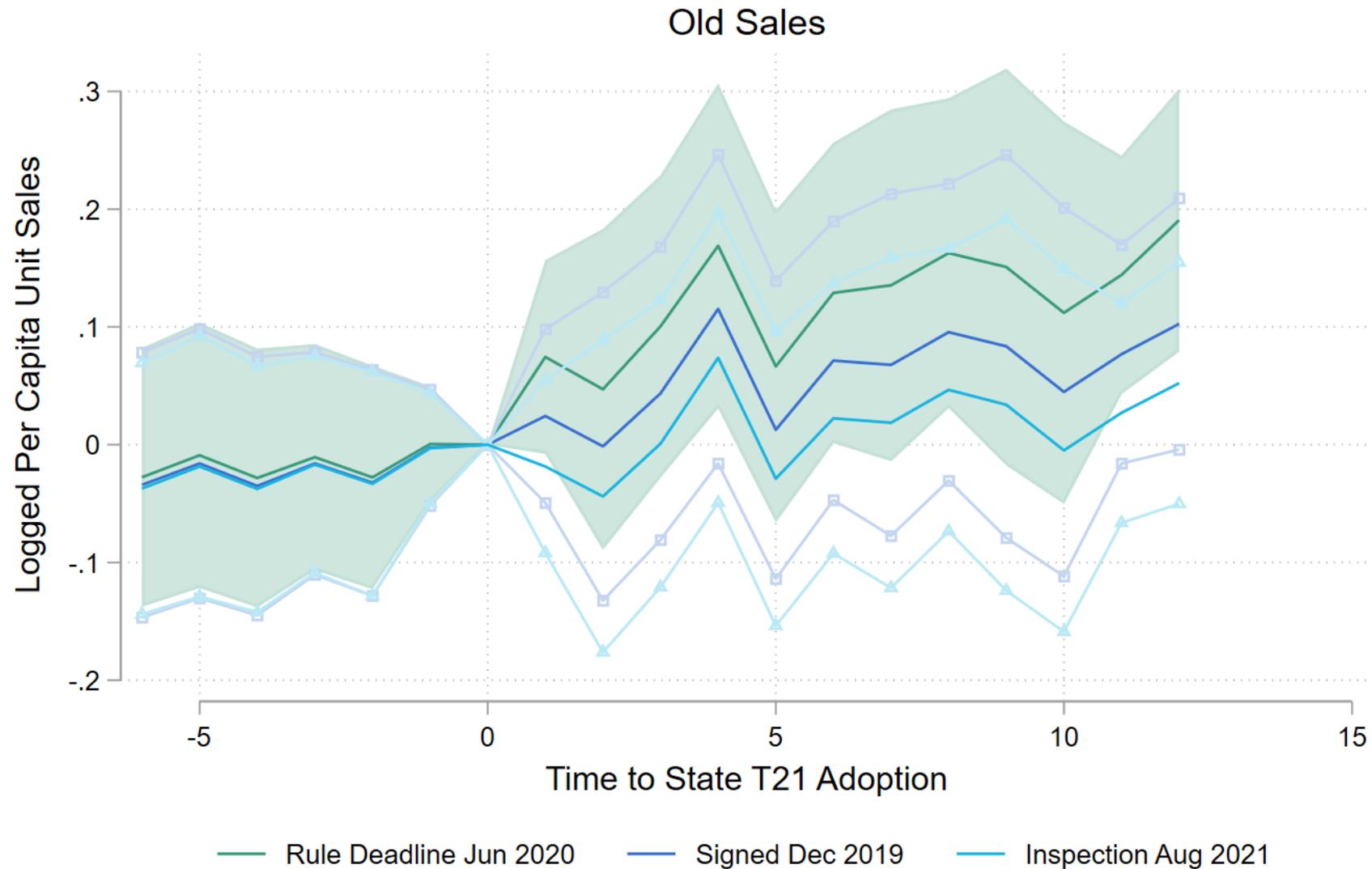
# Sensitivity check: National T21 Dates and Young Brands



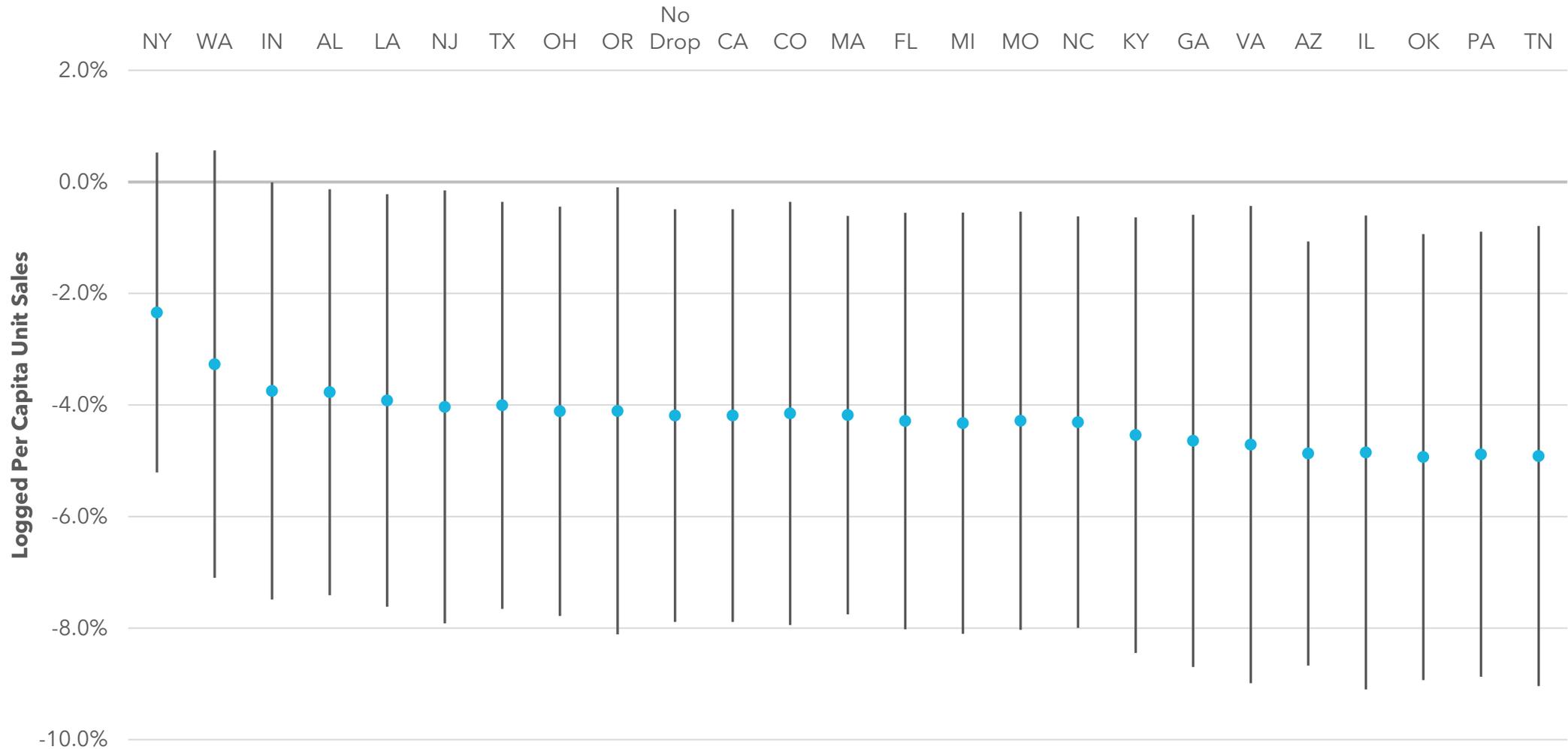
# Sensitivity check: National T21 Dates and Proportionate Brands



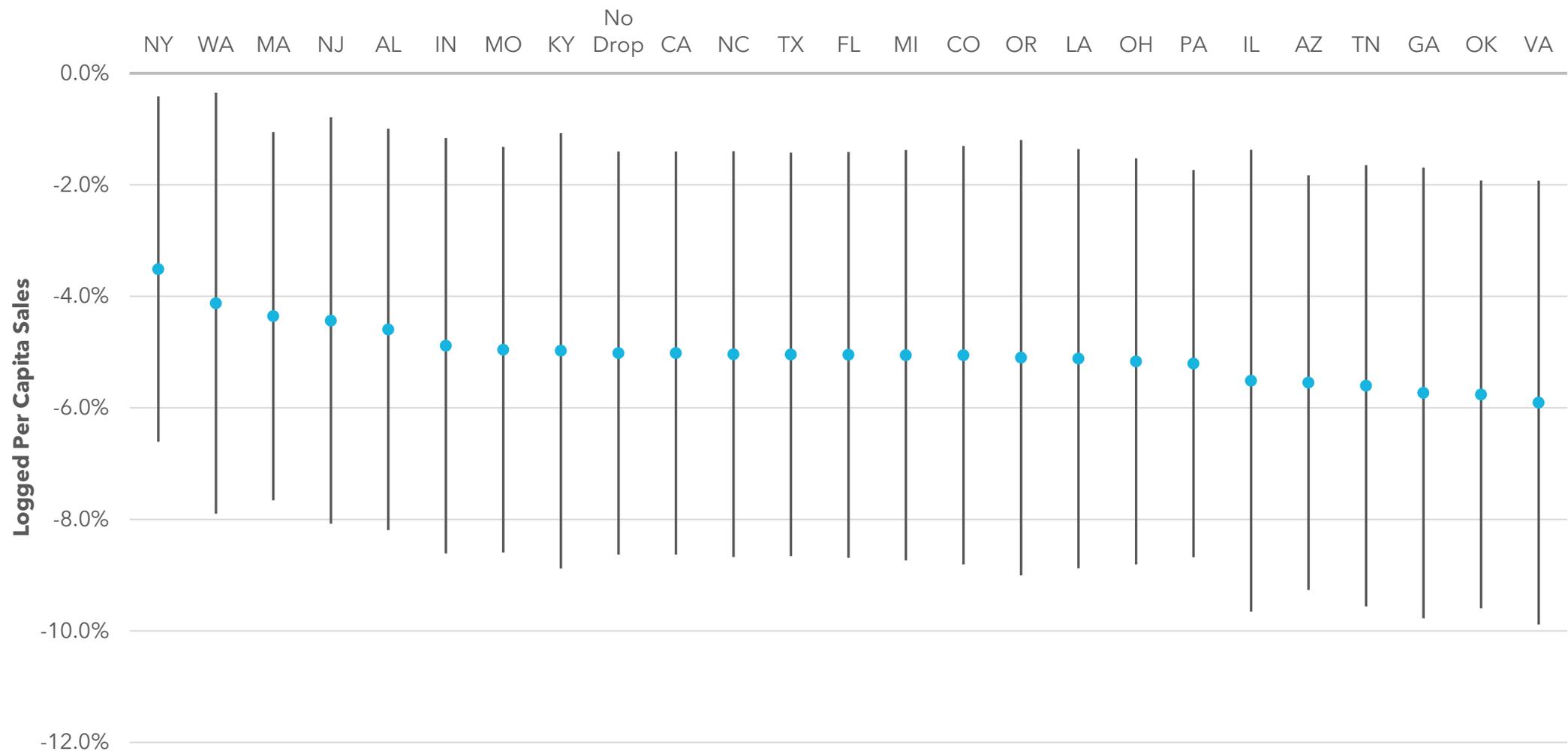
# Sensitivity check: National T21 Dates and Old Brands



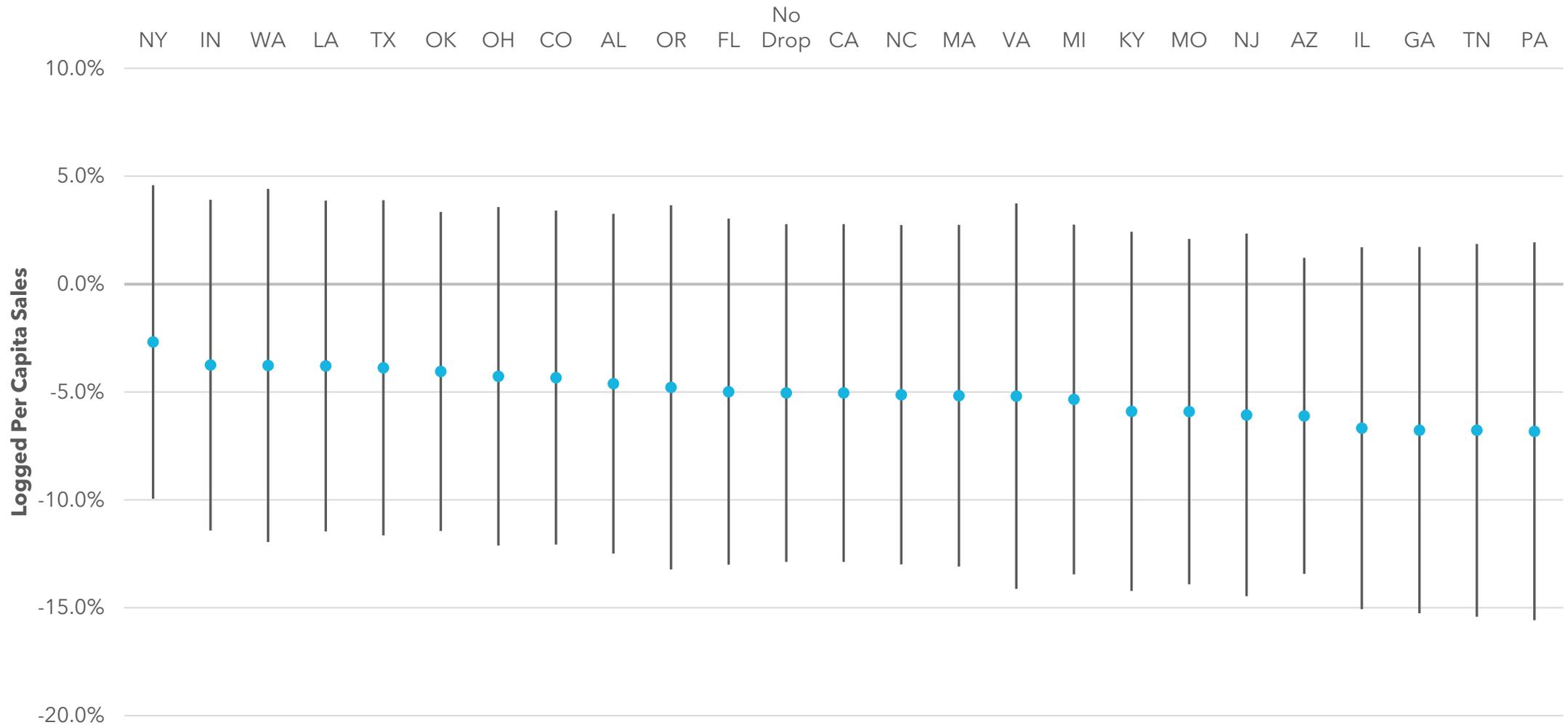
# Sensitivity Check: Total Sales Full Model Drop One Tests



# Sensitivity Check: Young Brand Sales Full Model Drop One Tests



# Sensitivity Check: Prop Brand Sales Full Model Drop One Tests



# Sensitivity Check: Old Brand Sales Full Model Drop One Tests



# Discussion

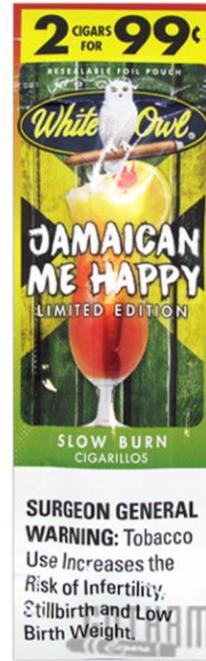
# Discussion

- State Tobacco 21 likely decreased cigar sales by 4%
- Decline slightly concentrated among brands used by people under age 21
- Unexpectedly, unflavored products were affected most
  - Could point to substitution effects or uneven enforcement
- Further work must look into the mechanisms behind this change

# Limitations

- 75% of the market was classified as youth disproportionate, limiting precision
- Unlogged sales pretrend issue
- Local T21 enactment and enforcement information not available

# Limitations - Limited Edition Caused Pretrend?



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Tobacco 21 seems to yield concentrated improvements in indicators important to the tobacco epidemic

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Its use should continue to spread, with a focus on finding what version of T21 works best

## Implications

# Future Directions

## Tobacco 21 policy details

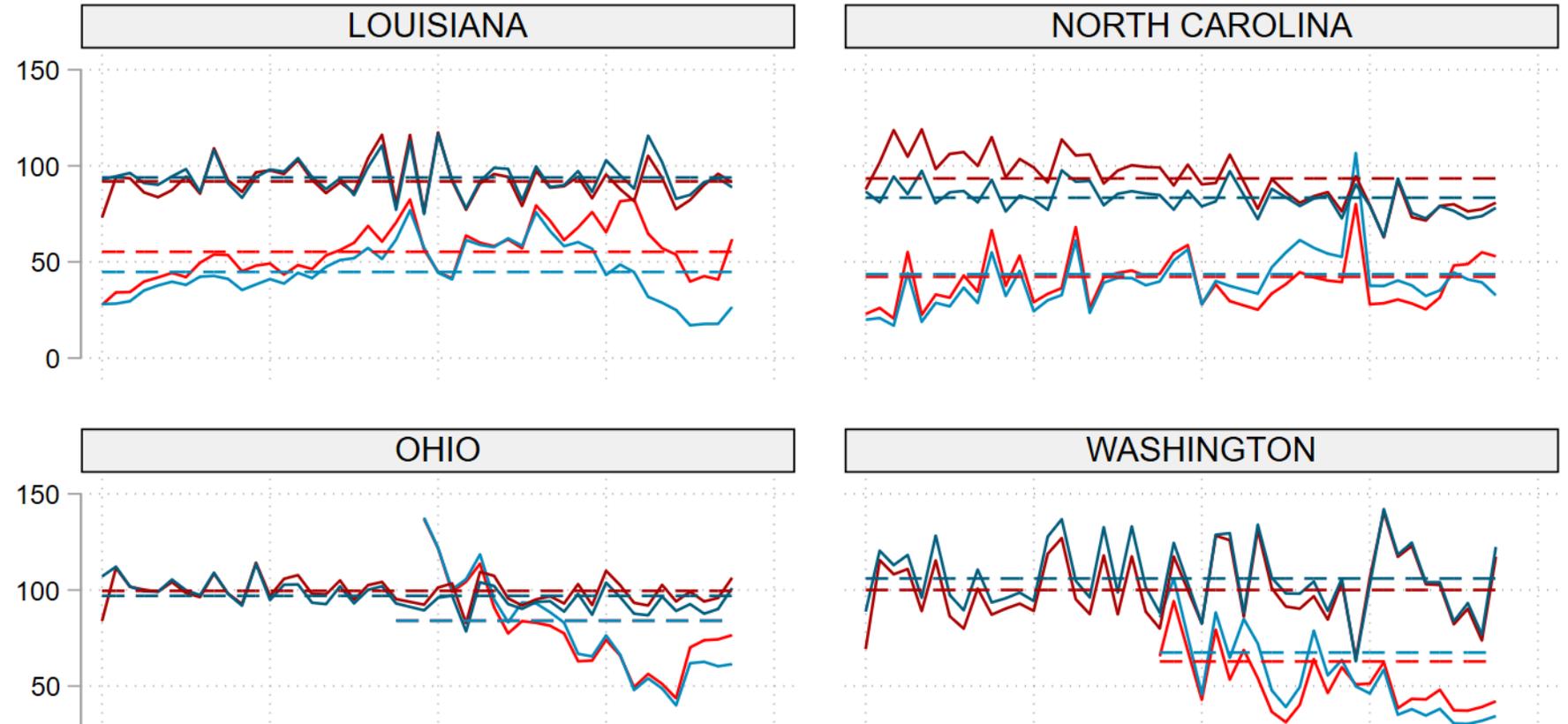
- Examining the role of bans on the purchase, use, and possession (PUP) of tobacco products by young people on tobacco sales

## Tobacco 21 enforcement

- Examining the effect of state and local T21 adoption on FDA retailer inspection results

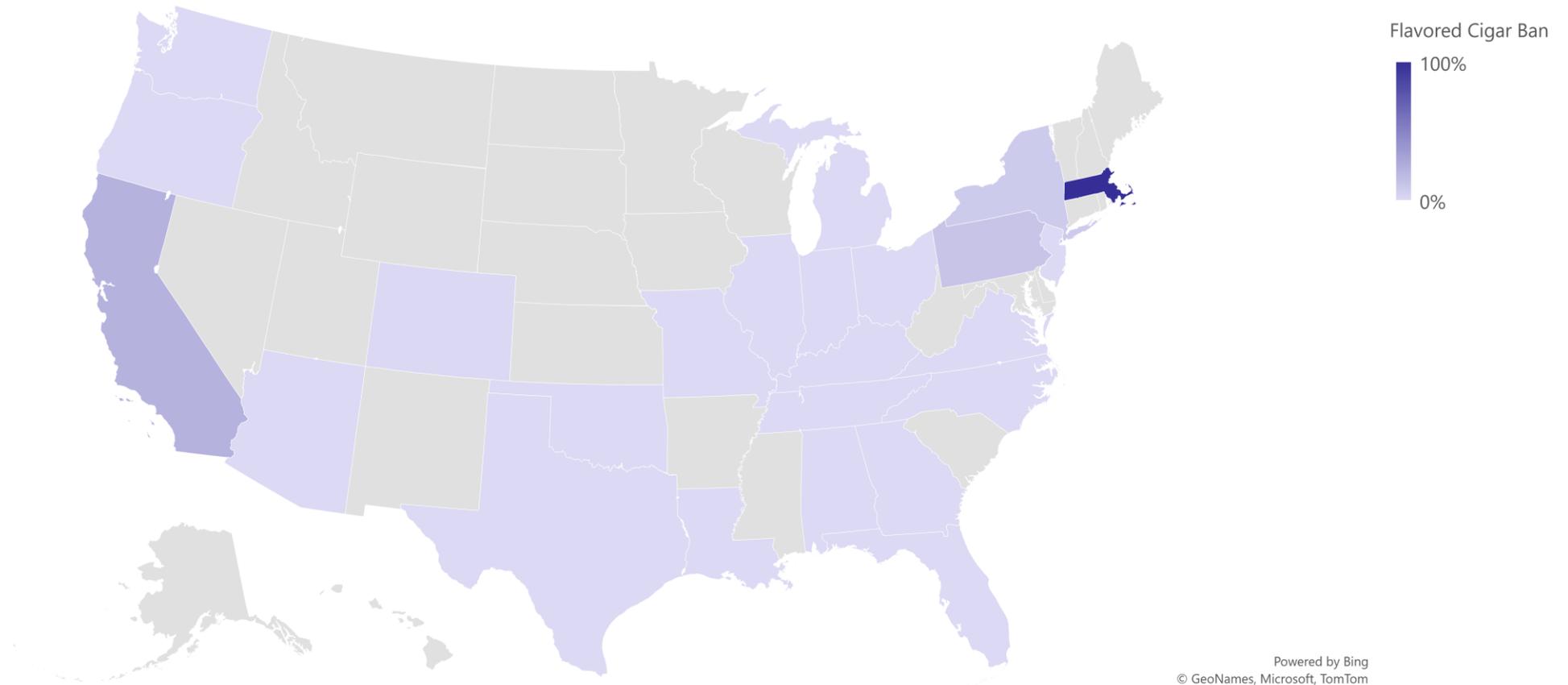
## Volume Sales as a Percent of Monthly Excise Tax Collections

### Sales Data Coverage of ENDS and Cigs



- It's not too bad (90%+ for cigs, 50%+ vol for ENDS)
- Cigars are even harder to test in this manner than ENDS

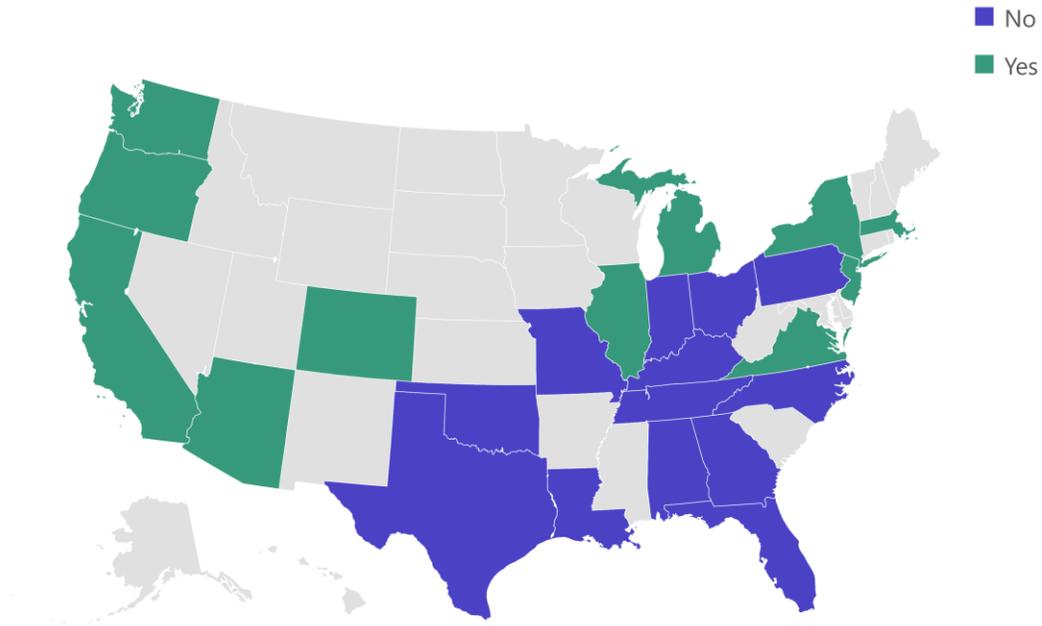
# Flavored Cigar Ban Coverage in Nov 2021





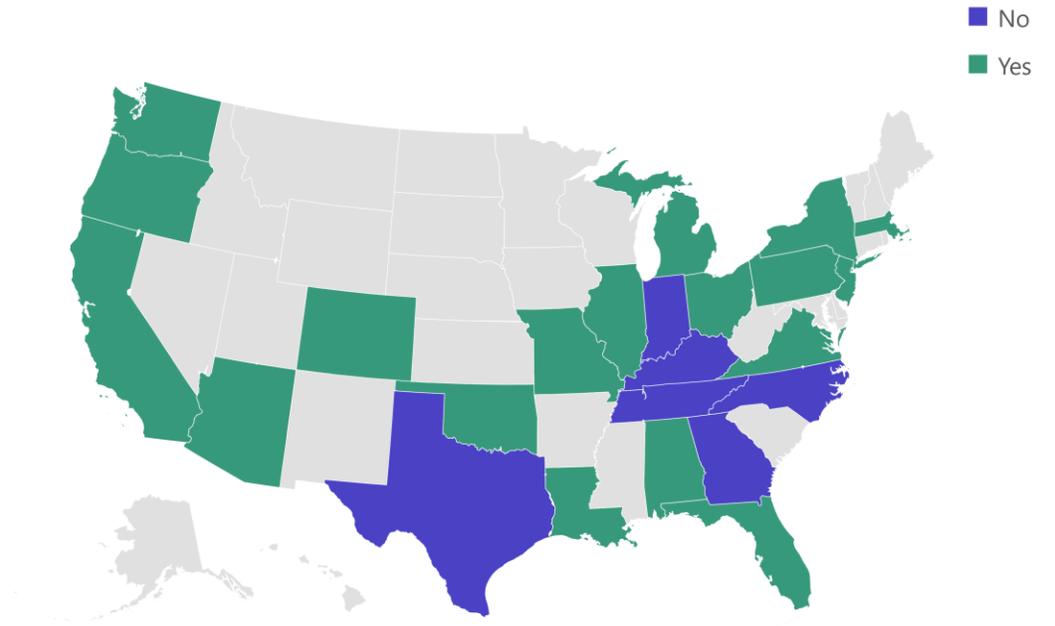
# Cannabis Legality in Nov 2021

## Recreational



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## Medical



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# Results of FDA Compliance Checks 2011-2022

