DID TOBACCO 21 LAWS AFFECT CIGAR SALES?
EVIDENCE FROM SURVEY AND SALES DATA

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• 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\(^1\)
• Cleveland, OH students were less likely to report smoking cigars after T21 adoption\(^2\)
• Little else…

Past Month Usage by Product (US, 12-20-Year-Olds, NSDUH)
Plan of Project

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

- Backwoods
- White Owl
- Dutch Masters
- Swisher Sweets
- Black & Mild
- Al Capone
- Blackstone
- Winchester
- Montecristo
- Acid
- Antonio y Cleopatra
- Primetime
- Zig Zag
- Game
- King Edward
- Garcia y Vega
- Captain Black
- Phillies
- Arturo Fuente
- Cheyenne
- Macanudos
- Romeo y Julieta
- Cohiba
- Djarum
- Rocky Patel's
- La Corona
- Punch

Brand Mean vs. Mean Without Young Proportionate Old
Young Brands
Proportionate Brands

- Garcia-Vega Natural Leaf Cigars
- Game Cigars for 99¢
- Winchester Little Cigars
- Zig-Zag Cigarillos
- PrimeTime Large Cigars

Surgeon General Warning: Cigars Are Not A Safe Alternative To Cigarettes.
Old Brands
When and where were T21 laws put into place?

• Colston et. al, 2021¹, 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

¹ doi:10.1016/j.amepre.2020.06.026
US Federalism Layer Cake

• T21 laws have been passed at federal, state, and local levels
• All have different enforcement powers, responsibilities, and funding
Enactment to Effective Gap

Pre-existing T19 Law
Local T21 Population Coverage Before State Laws - Colston et al.
When Did Federal T21 Go Into Effect?

Dec 2019
- Law Signed

Feb 2020
- First Under 21 Charges

Mar 2020
- Rule Progress Report Due (Missed)

Jun 2020
- Rule Delay Justification (Missed)

Aug 2021
- Under 18 Charges Stop

Mar 2022
- Kaine Letter Asks FDA For Final Rule

Kaine Letter: bit.ly/3YwZgFG
When Did Federal T21 Go Into Effect?

[Graph showing violations per month for Under 21 and Under 18 from Jan-11 to Jan-23.]

Specifying T21

- 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

<table>
<thead>
<tr>
<th>Types of Brands</th>
<th>Unflavored</th>
<th>Flavored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Brands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportionate Brands</td>
<td>Unflavored</td>
<td>Flavored</td>
</tr>
<tr>
<td>Young Brands</td>
<td>Unflavored</td>
<td>Flavored</td>
</tr>
</tbody>
</table>
Nielsen ScanTrack Conv+xAOC States
Nielsen State T21 Laws in Study Period
### Additional State Control Variables

<table>
<thead>
<tr>
<th>Extra Tobacco Control</th>
<th>Policy and Environmental Variables</th>
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</thead>
<tbody>
<tr>
<td>Percent Covered by a ban on the sale of flavored cigars</td>
<td>Recreational Marijuana Sales Legal</td>
</tr>
<tr>
<td>Cigarette excise taxes</td>
<td>Medical Marijuana Sales Legal</td>
</tr>
<tr>
<td>Cigar excise taxes</td>
<td>Unemployment Rate</td>
</tr>
<tr>
<td>($ per pack)</td>
<td>Heating Degree Days</td>
</tr>
<tr>
<td>ENDS excise taxes</td>
<td>($ per stick; % of price)</td>
</tr>
<tr>
<td>($ per Juul pod standardized by Cotti et al., 2021)</td>
<td></td>
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<tr>
<td>Percent covered by a workplace smoking ban</td>
<td></td>
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</tbody>
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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
+ Environmental Vars
-4.2%, 95% CI(-7.9% – -0.5%)
Environmental Vars
-5.0%, 95% CI(-8.6% – -1.4%)
Environmental Vars

-5.0%, 95% CI(-12.9% – 2.8%)
Old Sales

+ Environmental Vars
1.4%, 95% CI(-8.9% – 11.6%)
State T21 Average Policy Effects - Logged PC Standard Unit Sales

Base + T21 Details + Tob Control Policy + Environmental Vars + Fed T21
Young
Prop
Old
Total

-20% -15% -10% -5% 0% 5% 10% 15%

-20% -15% -10% -5% 0% 5% 10% 15% 20%

%8.5% %6.5% %6.5% %0.5% %0.7% %6.9% %5.4% %6.2% %5.0% %8.2%

1.6% 0.1% 0.8% 1.4% 12.1% 5.5% 5.0% 5.2% 4.2% 4.5%

-20% -15% -10% -5% 0% 5% 10% 15% 20%

-20% -15% -10% -5% 0% 5% 10% 15% 20%

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1.6% 0.1% 0.8% 1.4% 12.1% 5.5% 5.0% 5.2% 4.2% 4.5%
T21 and Sales Full Model

Logged Per Capita Unit Sales

Time to State T21 Adoption

-4.4%, 95% CI(-8.1% - 0.6%)  Young Unflavored  Young Flavored  -4.5%, 95% CI(-8.8% - 0.1%)
Sensitivity Checks
Sensitivity check: National T21 Dates and Total

Total Sales

Logged Per Capita Unit Sales vs Time to State T21 Adoption

- Rule Deadline Jun 2020
- Signed Dec 2019
- Inspection Aug 2021
Sensitivity check: National T21Dates and Young Brands

![Graph showing Young Sales over time](image)
Sensitivity check: National T21 Dates and Proportionate Brands

Prop Sales

Logged Per Capita Unit Sales

Time to State T21 Adoption

Rule Deadline Jun 2020  Signed Dec 2019  Inspection Aug 2021
Sensitivity check: National T21Dates and Old Brands
Sensitivity Check: Young Brand Sales Full Model Drop One Tests

Logged Per Capita Sales

-12.0% -10.0% -8.0% -6.0% -4.0% -2.0% 0.0%
Sensitivity Check: Prop Brand Sales Full Model Drop One Tests

Logged Per Capita Sales

No Drop CA NC MA VA MI KY MO NJ AZ IL GA TN PA
Sensitivity Check: Old Brand Sales Full Model Drop One Tests

Logged Per Capita Standard Units

-15.0%
-10.0%
-5.0%
0.0%
5.0%
10.0%
15.0%
20.0%
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 pretend issue
• Local T21 enactment and enforcement information not available
Limitations - Limited Edition Caused Pretrend?
Tobacco 21 seems to yield concentrated improvements in indicators important to the tobacco epidemic. Its use should continue to spread, with a focus on finding what version of T21 works best.
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
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
Smoke Free Workplace Coverage in Nov 2021
Cannabis Legality in Nov 2021

Recreational

Medical
Results of FDA Compliance Checks 2011-2022

Visits Ending with Violation

- Sale to a Minor w/ Underage Involved
- Under 21 Sale
- Failure to Verify ID