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Original Investigation

The Effect of State and Local Flavored Cigar Sales Restrictions, on Retail Sales of Large Cigars, Cigarillos, and Little Cigars in Massachusetts, California, Illinois, and New York

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Abstract

Introduction: In 2009, the Family Smoking Prevention and Tobacco Control Act prohibited flavored cigarettes but allowed for flavored cigars. Since, there has been a 34% increase in youth cigar use and widened racial disparities. State and local jurisdictions have increasingly enacted flavored tobacco product sales restrictions. As more jurisdictions consider implementing flavor restrictions, it is important to understand their effect on tobacco markets that have high flavor proliferation, including the cigar market.

Aims and Methods: This study uses data from Truth Initiative's flavor policy database and NielsenIQ retailer scanners for California, Illinois, Massachusetts, and New York. We use a three-way fixed-effect model to assess the impact of the percentage of the population covered by a flavored cigar sales restriction on per capita unit sales of cigars.

Results: We find that population coverage by cigar sales restrictions was significantly associated with decreases in per capita cigar sales. More specifically, a 25% increase in the percentage of the population covered by a flavored cigar sales restriction was associated with a decrease in per capita all cigar sales of 15%–19%, 4%–10% for large cigars, 17%–21% for cigarillos, and 2%–41% for little cigars.

Conclusion: Flavored cigar sales restrictions are an effective policy to reduce per capita cigar sales. The Food and Drug Administration (FDA)'s proposed product standards would increase population covered by a flavored cigar sales restriction to 100%, leading to potential significant reductions in cigar sales, especially little cigar, and cigarillo sales. This may also substantially reduce youth cigar use and racial disparities in cigar use.

Implications: In April 2022, the U.S. FDA published a proposed rule to prohibit characterizing flavors in all cigars and menthol cigarettes. Besides this proposed rule, there has been little federal action to date to reduce sales of flavored cigars. However, as of March 31, 2022, Massachusetts and 333 localities across 10 states have enacted policies that restrict the sale of flavored cigars and other tobacco products. We find that population coverage by cigar sales restrictions is significantly associated with decreases in per capita cigar sales.

Introduction

A large body of research demonstrates that flavors play a key role in youth initiation of tobacco products and in driving tobacco use disparities.[1–7] This has led policymakers and tobacco control advocates in the United States to identify opportunities to restrict the sale of flavored tobacco products. To date, federal regulations restricting flavored tobacco product sales have largely focused on cigarettes over other flavored tobacco products, including cigars. Most notably, in 2009, Congress enacted the Family Smoking Prevention and Tobacco Control Act,[8] which, among other actions, prohibited flavored cigarettes, except menthol, but allowed for cigars of any flavor. Following the Tobacco Control Act, sales of cigarette-like cigars surged,[9] especially those flavored to taste like something other than tobacco; one study indicates that the 2009 Tobacco Control Act was associated with a 34.4% increase in cigar use among youth.[10] Furthermore, there are concerning disparities in how cigars are marketed to non-Hispanic black and low-income communities.[11] For example, black individuals are significantly more likely to report cigar use in comparison to white individuals.[12,13] In addition, the national prevalence of cigar smoking is lower among those with higher socioeconomic status than those of lower socioeconomic status.[14]

Increased use of cigars and disparities in cigar use are concerning given the health effects and perceptions of cigars—particularly little cigars and cigarillos (LCCs). Research has found that, compared to smoking cigarettes, smoking little cigars is associated with higher exposure to carbon monoxide and possibly other harmful toxicants.[15] Despite these health concerns, cigars have been promoted as and are commonly misperceived as safer tobacco products.[16] A 2015 study[17] using a sample of U.S. adults who were aware of LCCs found

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that around a third of the sample did not know the risks of flavors in LCCs. Younger adults in this study had higher odds of reporting LCC flavors as "not at all risky," "a little risky," or "somewhat risky" than "very risky" compared to older adults. Additionally, compared to those who did not use LCCs, ever and current LCC users and ever users of flavored LCCs were more likely to view flavors in LCCs as less risky.

Cigar manufacturers have done much to manipulate and evolve their products to increase their appeal to new users. For instance, tobacco companies created little cigar products to look more like cigarettes and less like cigars, introducing products with filters and flavored filtered tips.[16] Tobacco companies have also used flavors to appeal to and recruit new users and attract specific demographic groups—particularly young, female, and African American users.[16] Moreover, tobacco companies have capitalized on loopholes in tax laws to promote cigar use. In 2009, the federal tax rate on little cigars was increased to be on par with cigarettes, leading several small cigar manufacturers to increase the weight of their products slightly to qualify as large cigars under the federal tax code to and thereby be taxed at a much lower rate.[18] These new "large cigars" can appear almost identical to small cigars and can cost as little as 7 cents per cigar.[19]

While there has been little federal action to date to reduce sales of flavored cigars, as of March 31, 2022, Massachusetts, Maine, and 309 localities across 7 states (California, Colorado, Illinois, Massachusetts, Minnesota, New York, and Rhode Island) had policies in effect that restrict the sale of all or some flavored cigars. Furthermore, in April 2022, the U.S. Food and Drug Administration (FDA) published a proposed rule to prohibit characterizing flavors in all cigars, citing concerns about the appeal of flavors in cigars, industry taking advantage of loopholes, and the high prevalence of flavored cigar use among youth and historically marginalized sociodemographic subgroups.[20]

Given the limited research examining the impact of state and local flavor policies on cigar sales and consumption, the current study calculates the percent of the population covered by state and local flavored cigar sales restrictions over time in four states—California, Illinois, Massachusetts, and New York—and accesses its impact on cigar sales. More specifically, we use NielsenIQ retailer scanner data to assess the impact of population coverage for flavored cigar sales restrictions on per capita sales of large cigars, cigarillos, and little cigars in these four states. Results from this study can inform tobacco control advocates and policymakers of the potential impacts of the FDA's proposed product standard prohibiting characterizing flavors in cigars nationally by increasing the proportion of individuals covered by a flavored cigar sales restriction.

Data Sources and Methods

Data and Measures

The states were selected from Truth Initiative's flavored tobacco sales restriction database, which tracks local and state flavored tobacco sales restrictions in the United States and codes for policy characteristics including types of tobacco products covered by the policy. We selected California, Illinois, Massachusetts, and New York as these four states had substantial proportions of the population covered by local- or state-level flavored cigar sales restrictions and we had cigar retail sales data for these states between 2013 Q4 and 2022 Q1. We excluded from our analysis Maine, Minnesota, and Rhode Island because we did not have access to retail sales data. Lastly, we excluded Colorado since only five cities and towns (Aspen, Carbondale, Edgewater, Glenwood Springs, and Snowmass Village) had enacted flavored tobacco sales restrictions that included cigars. These five laws protect less than 1% of the population in Colorado—a proportion that is too small to produce measurable changes in state-level per capita cigar sales.

Dependent Variables

We used retail scanner sales data from NielsenIQ for large cigars, cigarillos, and little cigars. This dataset captures sales from independent, chain, and gas station convenience stores; food, drug, and mass merchandisers, discount, and dollar stores; and military commissaries. The data are provided in 4-week period aggregates, which we aggregated to the quarterly level from 2013 Q4 to 2022 Q1.

Cigar Classification.

NielsenIQ does not provide cigar classifications so we conducted extensive online searches using information from product packaging provided to us by NielsenIQ and classified our data into mutually exclusive categories of large cigars, cigarillos, and little cigars. Similar methods for classifying cigars have been used and are described elsewhere.[21,22] Coders saved pictures for all products classified. All products were divided up among two coders, with a 20% overlap in product classification. Discrepancies were reconciled by the first author (MCD).

Per Capita Sales.

We created four dependent variables: Per capita sales of all cigars, large cigars, cigarillos, and little cigars by summing the total number of each category of cigars—large cigars, cigarillos, and little cigars sold in each state for each quarter and dividing by total state population figures provided by the 2020 U.S. Census Bureau (Census).

Main Explanatory Variable—Percent of the Population Covered by Flavored Cigar Sales Restrictions

We used Census data for cities and counties in the states of California, Illinois, Massachusetts, and New York to calculate the total number of people covered by a flavored cigar sales restriction by the end of each quarter of our study period. Within some counties, flavored cigar sales restrictions were only effective in unincorporated or incorporated areas. As a result, we used the unincorporated or incorporated population depending on where the restrictions were implemented. We divide the total number of people covered by a flavored cigar sales restriction by the state population to obtain a number between zero and one which estimates the proportion of the population covered by a flavored cigar sales restriction. For ease of interpretation, we convert this proportion into a percentage. To calculate the numerator of our proportion, we defined a flavored cigar sales restriction as a law prohibiting some or all retailers in a jurisdiction from selling some or all types of flavored cigars. As defined, our measure captures increases in coverage of sales restrictions over time, but does not take into account variation in policy strength across cities and counties or comprehensiveness (i.e. the products, flavors, and retailers included in the policy).

Other Independent Variables

Cigar Price.

We used total sales dollars and the total number of all cigars, large cigars, cigarillos, and little cigars from NielsenIQ data to create the sales-weighted average price of a cigar (all combined), a large cigar, a cigarillo, and a little cigar. We then adjusted the sales-weighted average price for cigars, large cigars, cigarillos, and little cigars for inflation to 2022 Q1 dollars using the Consumer Price Index provided by the U.S. Bureau of Labor Statistics.

Tobacco Control Policies and State Characteristics.

To control for other state-level tobacco control policies that may be related to our outcomes, we included a measure that captures the percentage of the population covered by a comprehensive smoke-free air law in private workplaces (from the American Nonsmokers' Rights Foundation (ANRF)). Lastly, we captured state-level characteristics by including median household income (from the 2020 Census and adjusted for inflation using the CPI) and state-level unemployment rates (from the Bureau of Labor Statistics).

Methods

We used regression models to assess the impact that the total percentage of population covered by a flavored cigar sales restriction has on per capita sales of all cigars, large cigars, cigarillos, and little cigars. More specifically, we examine how the percentage of the population covered by a flavored cigar sales restriction varies within state over time and estimate models that include year, quarter, and state-fixed effects. Our three-way fixed-effects models use a state fixed-effect to control for time-invariant unobserved factors at the state level, a year fixed-effect to control for unobserved changes in the distribution of per capita sales over time, and a quarter fixed-effect to control for unobserved per capita sale seasonality. To account for our regression error terms being correlated within states, we used a robust standard error and clustered it at the state level in all our models.

We estimated five models for all cigars, the first of which did not include any of our covariates. We then included our covariates, cigar prices, smoke-free air laws in private workplaces, median household income, and the unemployment rate, one at a time in our models to eliminate the possibility of collinearity among our covariates. Models 2–5 add each covariate iteratively: Model 2 includes the price of all cigars, model 3 includes the price of all cigars and smoke-free air-laws in private workplaces, model 4 includes the price of cigars, smoke-free air-laws in private workplaces and median household income. Lastly, model 5 is the most conservative model, since it includes all independent covariates: Price of cigars, smoke-free air laws in private workplaces, median household income, and the unemployment rate.

We also ran model 5 using a generalized linear model (GLM) with log-link and Gamma distribution as a sensitivity analysis to account for the possibility that the relationship between the percentage of the population covered by a flavored cigar sales restriction and per capita sales may not be linear as implied by our use of a three-way fixed-effects model. Given that GLM models are non-linear, and their estimated coefficients can only tell us the direction of the effect but not the magnitude, we ran a simulation to predict how per capita sales would change with a 25% increase in the percentage of the population covered by a flavored cigar sales restriction. Lastly, we replicated model 5 using our three-way fixed effect and GLM models to estimate the effect that the percentage of the population covered by a flavored cigar sales restriction would have on large cigars, cigarillos, and little cigars separately, instead of aggregated together.

Results

Summary Statistics

Table 1 presents summary statistics for all four states included in the analysis. Overall, the average sales across all four states were 2.21 cigars per person per year per quarter. Across all four states, average per capita cigarillo sales per year per quarter were the largest, followed by little cigars, and large cigars. Illinois averaged 1.86 per capita cigarillos per year per quarter, while Massachusetts averaged 1.56. Across all states, Massachusetts had the largest sales of little cigars, 1.41 per person, and cigars overall, 3.15 per person per year per quarter. The real sales weighted average price of a cigar (all combined) across all states per year per quarter was $0.84.

The percentage of the population covered by a flavored cigar sales restriction across all states averaged 28% per year per quarter, though differences in coverage were observed across all four states (Supplementary Figure 1). As seen in Supplementary Figure 1, California's percentage of the population covered by flavor cigar sales restrictions increased from zero percent to almost 23% by the third quarter of 2021. This increase is attributable to 100 local policies that were implemented in California during our study period. In Illinois coverage is less pronounced, as only Chicago implemented a policy on July 20, 2016, that covers about 21% of the population. The same is true for New York, where only New York City and Manheim have flavor cigar sales restrictions. Since New York City implemented its policy on October 28, 2009, variation is limited, with coverage averaging about 43% over our study period. Lastly, Massachusetts experienced the largest increase in coverage, going from zero percent to full statewide coverage. This increase in coverage (from 0 to 67%) is due to 177 local policies that were implemented in Massachusetts from the beginning of our study period till June 1, 2020, when a statewide policy was implemented.

Modeling

Table 2 presents estimates of the effect of total percentage of population covered by flavored cigar sales restrictions on per capita unit sales of all cigars. Across all five models, the percentage of the population covered by a flavored cigar sales restriction was significantly associated with decreases in per capita cigar sales. Depending on model specification, a 25% increase in coverage is associated with a reduction of 0.76 to 0.43 per capita cigars, a 34.3% to 19.4% reduction from the mean (calculations not shown in Table 2). In all models, price was associated with decreases in per capita cigar sales, though none of these results were statistically significant. We defined statistical significance using a level of 0.05 of a two-tailed test.

Table 3 presents results of our most conservative model, model 5, for all cigars (also presented in Table 2, Model 5), large cigars, cigarillos, and little cigars. We present both our estimates from our three-way fixed-effect models and our sensitivity results using GLM models. Across the three-way fixed-effect models, we find that the percentage of the population covered by a flavored cigar sales restrictions was significantly associated

Table 1. Summary Statistics

	All States	California	Illinois	Massachusetts	New York
Per capita sales					
All cigars	2.21 (0.90)	1.53 (0.30)	2.43 (0.57)	3.15 (1.05)	1.71 (0.35)
Large cigars	0.15 (0.06)	0.09 (0.03)	0.21 (0.05)	0.18 (0.04)	0.11 (0.03)
Cigarillos	1.48 (0.46)	1.11 (0.23)	1.86 (0.52)	1.56 (0.34)	1.38 (0.37)
Little cigars	0.58 (0.61)	0.33 (0.09)	0.36 (0.07)	1.41 (0.75)	0.22 (0.08)
Real sales weighted average price (2022 Q1 dollars)					
All cigars	$0.84 (0.14)	$0.83 (0.06)	$0.75 (0.06)	$0.82 (0.14)	$0.97 (0.16)
Large cigars	$1.43 (0.42)	$1.12 (0.17)	$1.09 (0.08)	$1.84 (0.44)	$1.65 (0.21)
Cigarillos	$1.00 (0.20)	$0.96 (0.11)	$0.81 (0.07)	$1.20 (0.09)	$1.03 (0.23)
Little cigars	$0.29 (0.09)	$0.37 (0.07)	$0.25 (0.04)	$0.19 (0.02)	$0.36 (0.06)
State-level characteristics					
Unemployment rate (%)	5.78 (2.40)	6.31 (2.42)	6.01 (2.15)	5.04(2.51)	5.76 (2.40)
Real median household income (2022 Q1 Dollars)	$82,102 (7,483)	$83,017 (2,790)	$78,483 (3,555)	$91,924 (5,445)	$74,983 (3,610)
Tobacco control policy coverage (population %)					
Private workplace smoke-free air laws	0.95 (0.19)	0.78 (0.34)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
Flavored cigar sales restriction	0.28 (0.26)	0.07 (0.09)	0.14 (0.10)	0.48 (0.35)	0.43 (0.00)
Observations	136	34	34	34	34

The unit observation is quarter year per state. Standard deviations are presented in parentheses.

with decreases in all cigars (also presented in Table 2, model 5), cigarillos, and little cigars. In Table 4, we use the point estimates provided in Table 3 and find that a 25% increase in coverage is associated with reductions of 0.43 per capita cigars, 0.31 per capita cigarillos, and 0.24 per capita little cigars—a respective 19.4, 20.7, and 41.2 percent reduction from the mean. Although not statistically significant, we find that per capita large cigars decrease by 10.2% from the mean.

We find comparable results using our GLM models to estimate simulations that predict how per capita sales would change with a 25% increase in the percentage of the population covered by a flavored cigar sales restriction. For our GLM simulations, we find that a 25% increase in coverage is associated with a 14.9% reduction for all cigars, and 16.9% for cigarillos. Similar to our three-way fixed-effects models, we find non-statistically significant effects for large cigars, but do find a 3.6% reduction in per capita sales in our simulation results. Lastly, and unlike our three-way fixed-effects models, we find non statistically significant effect for little cigars, but do find a 2.4% reduction in per capita sales in our simulation results. (Table 4).

Discussion

Previous research indicates that flavored cigar sales restrictions can reduce cigar availability and sales.[23–28] Our study is the first to use both linear and non-linear models to demonstrate their effectiveness over time. The results of our study add to the evidence base, demonstrating the potential effects of increasing the proportion of individuals covered by a flavored cigar sales restriction in reducing the sales of these products. Using both fixed-effects and GLM modeling techniques, with various model specifications and simulations, we find that flavored cigar sales restrictions significantly reduce per capita sales of all cigars. We find this result even after control for cigar prices, smoke-free air laws in private workplaces, median household income and the unemployment rate. Prices while negative in all our models were not strong predictors of per capita cigar sales.

Given that there are substantial disparities in LCC use,[13] these findings suggest that flavored cigar sales restrictions may reduce health inequities among population groups that have been economically and socially marginalized. Our results also indicate that the effects of increased population coverage by flavored cigar sales restrictions are more pronounced for cigarillos and little cigars than large cigars. Although we observed imprecisely estimated decreases for large cigars in both models, the restrictions we modeled are for flavored cigar sales, and large cigars do not tend to be flavored.[22] In our data, we estimate that on average 13 percent of large cigars are flavored. Additionally, large cigars are predominantly purchased at cigar specialty stores, and NielsenIQ scanner data does not fully capture the market for large cigar sales.

Table 2. Estimates of the Effect of the Percentage of Population Covered by a Flavored Cigar Sales Restriction On Per Capita Cigar Unit Sales of All Cigars

Model:	Three-way fixed-effect models				
Outcome:	**(1) Per capita all cigars**	**(2) Per capita all cigars**	**(3) Per capita all cigars**	**(4) Per capita all cigars**	**(5) Per capita all cigars**
Percentage of population covered by a cigar sales flavor restriction	−3.03*** (0.441)	−2.21** (0.422)	−1.98** (0.400)	−2.06*** (0.348)	−1.71** (0.311)
Real sales weighted average price of a cigar (all cigars—2022 q1 dollars)	—	−1.83 (1.384)	−2.09 (1.338)	−2.02 (1.280)	−1.89 (1.003)
Private workplace smoke-free air laws (population %)	—	—	0.43 (0.454)	0.44 (0.476)	0.25 (0.416)
State-level unemployment rate	—	—	—	0.05 (0.031)	0.06 (0.036)
Real median household income (2022 q1 dollars)	—	—	—	—	−0.00 (0.000)
Constant	1.86*** (0.231)	3.58* (1.194)	3.47** (1.030)	2.97** (0.933)	7.99* (2.848)
Quarter fixed effect	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y
State fixed effect	Y	Y	Y	Y	Y
Observations	136	136	136	136	136
R-squared	0.585	0.645	0.653	0.668	0.692
Number of states	4	4	4	4	4

*** $p < .01$, ** $p < .05$, * $p < .1$.
Robust standard errors are presented in parentheses.

Table 3. Estimates of the Effect of Total Percentage of Population Covered by a Flavored Cigar Sales Restriction on Per Capita Cigar Unit Sales by Cigar Type Using a Three-Way Fixed-Effect Model and Sensitivity Results Using Generalized Linear Model Models

Model:	Three-way fixed-effect models				GLM models			
Outcome:	**(1) Per capita all cigars**	**(2) Per capita large cigars**	**(3) Per capita cigarillos**	**(4) Per capita little cigars**	**(5) GLMall cigars**	**(6) GLM large cigars**	**(7) GLM cigarillos**	**(8) GLM little cigars**
Percentage of population covered by a cigar sales flavor restriction	−1.71** (0.311)	−0.06 (0.058)	−1.22** (0.338)	−0.96** (0.221)	−0.65*** (0.132)	−0.16 (0.444)	−0.78*** (0.146)	−0.10 (0.532)
Real sales weighted average price of respective cigar type (2022 q1 dollars)	−1.89 (1.003)	−0.01 (0.024)	−0.26 (0.194)	−3.33 (2.267)	−0.62* (0.369)	−0.15 (0.197)	−0.19** (0.093)	−4.97** (2.167)
Private workplace smoke-free air laws (population %)	0.25 (0.416)	−0.01 (0.021)	−0.32 (0.255)	0.12 (0.275)	0.14 (0.146)	−0.17 (0.124)	−0.10(0.122)	0.62* (0.341)
State-level unemployment rate	0.06 (0.036)	0.00* (0.000)	0.04 (0.023)	0.01 (0.020)	0.03** (0.012)	0.02** (0.007)	0.03** (0.013)	0.02 (0.017)
Real median household income (2022 q1 dollars)	−0.00 (0.000)	0.00 (0.000)	−0.00 (0.000)	−0.00 (0.000)	−0.00** (0.000)	−0.00 (0.000)	−0.00 (0.000)	−0.00* (0.000)
Constant	7.99* (2.848)	0.01 (0.313)	2.60 (1.991)	5.22 (2.263)	2.27** (1.056)	−2.44 (2.053)	0.91 (1.097)	2.05 (1.541)
Quarter fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
State fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
Observations	136	136	136	136	136	136	136	136
R-squared	0.692	0.294	0.674	0.726	—	—	—	—
Number of states	4	4	4	4	4	4	4	4

*** $p < .01$, ** $p < .05$, * $p < .1$. GLM = generalized linear model.
Robust standard errors are presented in parentheses.

Table 4. Outcome Regression Estimates and Generalized Linear Model Simulations for a 25% Increase in the Percentage of the Population Covered by a Flavor Cigar Sales Restriction

	Per capita all cigars	Per capita large cigars	Per capita cigarillos	Per capita little cigars
Three-way fixed-effects models				
Outcome variable mean	2.21	0.15	1.48	0.58
Regression estimates for a 25% increase in the percentage of the population covered by a flavored cigar sales restriction	−0.43	−0.02	−0.31	−0.24
Percentage change from the mean	−19.4%	−10.2%	−20.7%	−41.2%
GLM models				
Predicted mean	2.20	0.15	1.47	0.57
Simulation mean estimate change for a 25% increase in the percentage of the population covered by a flavored cigar sales restriction	1.87	0.14	1.22	0.56
Percentage decrease from the predicted mean	−14.9%	−3.6%	−16.9%	−2.4%

Our findings that flavored cigar restrictions at the state and local level are effective in reducing cigar sales, along with previous research on the impacts of such policies, provide evidence that the current, proposed federal restriction would have a strong impact on reducing cigar smoking rates and health-related disparities across the United States.[23–29] We know flavors have overwhelmingly been used to attract those who have not previously used tobacco products.[1,3,4] However, until the FDA finalizes and implements this proposed rule restricting the sale of flavored cigars, many localities and states have and should use the opportunity to restrict the sale of flavored tobacco products, including cigars. Doing so limits the availability of such highly appealing tobacco products to youth. These flavored tobacco product laws must apply to all cigars and not exempt any type of cigar product, such as so-called premium cigars, as previous research indicates that regulations exempting some flavored products have been followed by industry modification or promotion of products that remain on the market, leading consumers to switch products rather than completely quit.[10,16,30] Flavored tobacco sales restrictions are viewed as one of many effective tobacco control policies and comprehensive flavored tobacco restrictions that cover all products, flavors, and retailers are likely to be most effective in reducing tobacco product sales and use.[28,31–37]

While our research has many strengths, it is not without limitations. First, our analysis used retail sales data, which while being a direct measure of consumption, do not provide information on which populations are purchasing and using cigars, intensity of use, or whether consumers quit because of flavored cigar sales restrictions. Future research should examine the effect of flavored cigar sales restrictions on cigar use, including cigar smoking among population subgroups. Second, 334 jurisdictions (309 of which include cigars) have passed flavored tobacco sales restrictions in the United States, and while we focused our analysis on flavored cigar sales restrictions in four states, we constructed our percentage of the population measure without considering variation in policy strength across cities and counties. More specifically, policies included in our analysis varied in law strength and comprehensiveness (i.e. the products, flavors, and retailers included in the policy). Although nearly all state and local policies applied to all types of cigars (i.e. large cigars, little cigars, and cigarillos), inclusion of menthol products in these policies was more variable: Chicago, IL, Manheim, NY, and most local policies in California applied to menthol flavored cigars, while New York City and most local policies in Massachusetts excluded menthol flavor. Similarly, retailer inclusions varied by jurisdiction: All local policies in New York and most in California restricted the sale of flavored tobacco in key retail settings (i.e. adult-only and tobacco specialty stores); however, the policy in Chicago, IL only applied to retailers near schools and most local policies in Massachusetts excluded adult-only retailers, allowing for the continued sale of flavored cigars by many retailers across these jurisdictions. Notably, the statewide policy in Massachusetts is more comprehensive than most local policies, as it applies to menthol-flavored products and key retail settings.

Our research shows that flavored cigar sales restrictions reduce per capita cigar sales, especially for cigarillos, and little cigars. When the FDA's proposed product standards prohibiting characterizing flavors in cigars and menthol cigarettes are finalized, this would increase the population covered by flavored cigar sales restrictions to 100%. In addition to reducing sales, these policies may greatly reduce youth cigar use and racial disparities in cigar use.

Supplementary Material

A Contributorship Form detailing each author's specific involvement with this content, as well as any supplementary data, are available online at https://academic.oup.com/ntr.

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Declaration of Interests

None declared.

Author Contributions

Megan Diaz (Conceptualization [Lead], Data curation [Equal], Formal analysis [Lead], Methodology [Lead], Writing—original draft [Lead]), Stephanie Yoon (Data

curation [Equal], Project administration [Lead], Writing—original draft [Supporting]), Emily Donovan (Writing—original draft [Supporting]), Maham Akbar (Writing—review & editing [Supporting]), and Barbara Schillo (Writing—review & editing [Lead]).

Data Availability

Due to contractual agreements, data cannot be made available to the public. The data that support the findings of this study are available from NielsenIQ but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of NielsenIQ.

Nielsen Disclaimer

The conclusions drawn from the NielsenIQ data are those of the researcher(s) and do not reflect the views of NielsenIQ. NielsenIQ is not responsible for, had no role in, and was not involved in analyzing and preparing the results reported.

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