Health Care Cost Savings Associated with the Massachusetts Flavored Tobacco Restriction on Menthol Cigarettes

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Key Takeaways

Background

- In June 2020, Massachusetts became the first state in the United States to restrict the sale of all flavored tobacco products, including menthol cigarettes.
- The Massachusetts Tobacco Cessation and Prevention Program (MTCP) conducted a comprehensive evaluation of the impact of the policy on tobacco use, access, and cessation.
- As part of this evaluation MTCP collaborated with economists John Tauras, Ph.D. and Frank Chaloupka, Ph.D. at the University of Illinois Chicago ("economists")to examine the impact of the policy on the retail environment and health care costs.

Healthcare Cost Savings

- Simulations conducted by economists show that restricting menthol cigarettes reduced smoking prevalence in Massachusetts by 1.37 percentage points between June 2020 and January 2023.
- As a result of reduced smoking prevalence, economists projected reductions in chronic disease and smoking-related birth/pregnancy complications, which would lead to healthcare cost savings.
    - Table 1. Direct cost savings (inclusive of inpatient and outpatient services and prescription drugs) due to reductions in lung cancer, heart attack, and stroke; and smoking-related birth/pregnancy complications and related health care costs for their children in their first year of life. All projected cost savings have been adjusted for inflation. Overall, 10-year costs savings were projected to be close to $200 million.

Table 1

	1 Year Cost Savings	5 Year Cost Savings	10 Year Cost Savings
Pregnancy	$775,742	$3,984,738	$8,191,116
Heart attack & stroke	$3,298,846	$45,644,111	$113,761,026
Lung Cancer	$714,588	$21,657,348	$76,015,640
Total	$4,789,176	$71,286,197	$197,967,782

- Economists also project reduced smoking prevalence would lead to Medicaid cost savings .
    - Table 2. Savings are inclusive of smoking attributable healthcare costs (ex. cancer, emphysema, arteriosclerosis, heart attack, stroke) incurred by Medicaid recipients who smoke in Massachusetts.
    - Medicaid savings may overlap with savings for specific conditions included in Table 1.

Table 2

	1 Year Cost Savings	5 Year Cost Savings	10 Year Cost Savings
Medicaid	$1,052,343	$15,651,763	$43,244,385

Limitations

- These projections are for menthol cigarettes alone and do not include other flavors or tobacco products.
- Projected cost savings are likely underestimates; overall cost savings do not include savings in other conditions that may be impacted by smoking, such as asthma, and the MassHealth cost savings do not account for all possible smoking-attributable conditions.

Introduction

In 2009, Congress enacted the Family Smoking Prevention and Tobacco Control Act, which restricted the use of characterizing flavors in cigarettes, except for menthol. More than a decade later, on October 13, 2023, the Food and Drug Administration (FDA) presented its finalized regulation to the Office of Management and Budget (OMB), prohibiting the sale of menthol cigarettes. Unfortunately, there has been no movement on this regulation since it was submitted to the OMB. Several states did not wait for federal regulation and took independent action to restrict the sale of flavored tobacco, including menthol cigarettes. In 2019, Massachusetts became the first state in the United States (US) to restrict the sale of all flavored tobacco products, including menthol cigarettes. Massachusetts' menthol cigarette restriction became effective June 1, 2020. The only exception to the Massachusetts policy is that flavored tobacco products can still be sold at adult-only licensed smoking bars where consumption must occur on-site. California became the second state to ban the retail sale of menthol cigarettes, effective December 21, 2022. There have also been significant local level efforts to restrict the sale of menthol cigarettes. According to The Campaign for Tobacco-Free Kids (CTFK), more than 190 localities prohibit the sales of all flavored tobacco products, including menthol cigarettes, (CTFK, 2024).

This report examines the effects of the Massachusetts flavor restriction on menthol cigarettes on smoking prevalence in Massachusetts and estimates the health care cost savings attributable to the restriction. Healthcare cost savings related to lung cancer, myocardial infarction and stroke, pregnancy/birth complications are estimated in addition to= Medicaid cost savings for smoking attributable conditions.

Brief Literature Review

Evidence is beginning to emerge on the effects of Massachusetts flavor restrictions on cigarette sales in Massachusetts. A study by Asare and colleagues (2021) found that after the flavor restriction was enacted, the adjusted 4-week sales of cigarettes in Massachusetts compared to the control states decreased by 372.27 packs per 1000 people for menthol cigarettes but increased by 120.25 packs per 1000 people for non-flavored cigarettes. Overall, the adjusted 4-week sales of all cigarettes in Massachusetts compared to the control states decreased by 282.65 packs per 1000 people. A follow-up study by Asare and colleagues (2022) found that following the implementation of the Massachusetts flavor restriction, compared with comparison states, monthly cigarette sales per 1,000 people decreased in Massachusetts by 350.02 packs and increased in bordering states by 9.51 packs per 1000 persons, yielding a net decrease of 340.51 packs per 1,000 persons in Massachusetts and neighboring states combined. This translates into total monthly cigarette sales declines of 2.45 million packs in Massachusetts and an increase of 0.13 million packs in bordering states, resulting in a net decrease of 2.32 million packs in Massachusetts and neighboring states. A study published by the Massachusetts Tobacco Cessation and Prevention Program (Kingsley et al., 2022) found that in the year after the Massachusetts flavor restriction went into effect, overall tobacco sales in Massachusetts decreased by 25.4% as compared with the previous year. The study found total sales of tobacco products in NH, NY, RI, and VT decreased by 1.8% in the year after the Massachusetts restriction was enacted compared with the previous year.

Our research builds upon these previous studies but examines the effects of the menthol cigarette restriction in Massachusetts on adult smoking prevalence utilizing the

national Behavioral Risk Factor Surveillance System (BRFSS). We then utilize the menthol restriction -induced changes in smoking prevalence in Massachusetts to quantify health care cost savings related to lung cancer, myocardial infarction and stroke, pregnancy/birth complications. In addition, cost savings specifically incurred by Medicaid on smoking attributable conditions were calculated.

Methods

Data

For this study, data from the 2016-2022 national Behavioral Risk Factor Surveillance System (BRFSS) were used. The BRFSS is a health-related telephone survey that collects data on U.S. residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services. BRFSS completes more than 400,000 adult interviews each year, making it the largest continuously conducted health survey system in the world.

The dependent variable used in the regressions was a dichotomous indicator equal to one for respondents who currently used cigarettes either every day or some days and was equal to zero for respondents who did not currently use cigarettes or had never used cigarettes before. Using other items from the survey, several independent variables believed to affect cigarette use among adults were constructed. These variables include indicators for sex (male and female [reference]), indicators for age (ages 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80 +, 18-24 [reference], indicators of marital status (divorced, widowed, separated, single, couple, and married [reference]), indicators for race and ethnicity (non-Hispanic Black, non-Hispanic American Indian or Alaskan Native, non-Hispanic Asian, non-Hispanic Native Hawaiian or Pacific Islander, non-Hispanic multiple races, non-Hispanic other

race, Hispanic, and non-Hispanic White [reference]), indicators of educational attainment (less than high school, some high school, high school graduate, some college, and college graduate [reference]), indicators of employment status (unemployed, homemaker, student, retired, unable to work, employed [reference]), and inflation adjusted household income. The household income variable was a quasi-continuous variable that used the midpoints of the categorical income responses. The values and categorical responses (in parentheses) follow: $5,000 (less than $10,000), $12,500 ($10,000 to less than$15,000), $17,500 ($15,000 to less than$20,000), $22,500 ($20,000 to less than$25,000), $30,000 ($25,000 to less than$35,000) and $42,500 ($35,000 to less than$50,000), $62,500 ($50,000 to less than$75,000), $85,000 ($75,000 or more). The household income levels were adjusted for inflation using the US Bureau of Labor Statistics Consumer Price Index (in 1st quarter 2021 dollars).

We also created mutually exclusive but all-inclusive dichotomous indicators for each year of the survey and each state in the survey. The dichotomous state indicators capture all time-invariant state-level unobserved heterogeneity, and the year indicators account for overall trends in adult cigarette use over time. We also created indicators for each quarter of the year to control for seasonality of cigarette use. We performed Hausman's 1978 specification test to determine if a fixed effects or random effects model is more appropriate by testing if the differences in their estimates are statistically significant (Hausman 1978). The null hypothesis of the Hausman test is that the random effects model is the better choice (meaning the random disturbance term, which captures the unexplained variation in the dependent variable, is assumed to be independent of the regressors). The Hausman specification test rejected the null hypothesis that the random effects model is appropriate. Hence, the fixed effects regression is

utilized in the analyses. Unobserved state factors, such as sentiment toward tobacco, are very likely driving changes in both the independent and dependent variables. That is, a state with a strong anti-tobacco sentiment may be more likely to enact a new tobacco control policy and have larger reductions in smoking than a state with weak anti-tobacco sentiment. The fixed effects approach controls for all time-invariant characteristics unique to each state, effectively removing any influence characteristics such as anti-tobacco sentiment might have on the dependent variable.

The final models employ a three-way fixed-effects regression technique. The fixed effects approach amounts to including a dichotomous indicator for each state (less one), each year (less one), and each quarter (less one) as additional explanatory variables in the models.

We created a dichotomous indicator equal to one for states with policies that restrict the sale of menthol cigarettes and equal to zero otherwise. The dichotomous indicator equals one for all respondents in the state of Massachusetts after June 1, 2020, and all respondents in the state of California after December 21, 2022, and is equal to zero otherwise[1].

Using state-geocode data we merged real state cigarette excise taxes with the BRFSS data based on the day the respondents were surveyed. Nominal state level cigarette excise taxes were obtained from the annual Tax Burden on Tobacco published by Orzechoski and Walker (2021). The nominal cigarette taxes were adjusted for inflation (1st quarter 2021 dollars) using the U.S. Bureau of Labor Statistics Consumer Price Index.

[1] As part of the 2022 BRFSS wave, 11,037 respondents from California were surveyed of which 2,417 were surveyed after the menthol policy went into effect on December 21, 2022.

Using state identifiers, we also merged a dichotomous indicator equal to one for individuals who resided in states that had enacted a smoke-free air law in private worksites at the time of survey, and was equal to zero for individuals who resided in states that did not impose a smoke-free air law in private worksites at the time of the survey. The smoke-free air law data were acquired from the Centers for Disease Control and Preventions State Tobacco Activities Tracking and Evaluation System.

Statistical Analysis

We used a three-way fixed effects approach to estimate the relationship between restriction on menthol cigarettes, cigarette taxes, smoke-free air laws and adult cigarette smoking prevalence. The three-way fixed-effects regression technique controls for time-invariant unobserved state-level heterogeneity (through the use of dichotomous state indicators), changes in the distribution of cigarette consumption by adults over time (through the use of dichotomous year indicators), and seasonality (through the use of dichotomous quarterly indicators). Controlling for unobserved state-level heterogeneity is critical in attempting to estimate a causal effect of menthol policies, taxes, and smoke-free policies on adult smoking prevalence as state sentiment towards tobacco use may be simultaneously driving both changes in cigarette smoking and changes in cigarette policies and taxes. The three-way fixed-effects approach is particularly appropriate for this research given that it is impractical to randomize individuals to locations with different cigarette policies and taxes before they are adopted. Finally, all models used robust standard errors clustered at the state level.

Table 1 contains the estimates from the cigarette smoking prevalence equations. Model 1 contains a model specification that includes the following covariates: flavored cigarette restriction indicator, real income, indicators for age, marital status, gender, race and ethnicity, educational attainment, and employment status. Moreover, Model 1 includes dichotomous year indicators, dichotomous state indicators, and dichotomous quarter indicators as part of our three-way fixed effect approach. Model 2 is based on Model 1 by adding two additional covariates: the inflation adjusted tax on cigarettes and the smoke-free air indicator variable. The inclusion of the two additional policy variables in Model 2 does not have any meaningful impact on the estimated effects of the flavored cigarette smoking restriction [2]To test for collinearity, we calculated variance inflation factors (VIFs) for the 3 tobacco related policies. The VIFs for the menthol sales restrictions, cigarette tax, and private worksite smoke-free air laws were 1.01, 1.18, and 1.17, respectively. We then calculated VIFs for each variable in Model 2 (i.e., the regression that includes the full set of covariates including all three tobacco control policies). The VIF for the menthol sales restriction in Model 2 was slightly higher at 1.56 and the mean VIF across all variables in regression Model 2 was 4.94. The extremely low VIF for the menthol sales restriction indicates a very low correlation of the menthol sales restriction (the main variable of interest in our analyses) with the other included predictor variables in the full regression specification, suggesting a low likelihood of multicollinearity.

All analyses were conducted in Stata 18 using the margins command to calculate predicted probabilities of smoking when the value of the key independent variable (menthol

flavor restriction on cigarettes) is altered from zero (no policy) to one (policy enacted) while holding all other independent variables at their actual values.

Table 1: Smoking Prevalence Equations

	Model 1 Coefficient (t statistic)	**Model 2 Coefficient (t statistic)**
Flavored Cigarette Restriction	-0.149*** (-4.21)	-0.157*** (-4.13)
Real Cigarette Tax		-0.0286** (-2.28)
Private Worksite Cigarette Ban		-0.00496 (-0.37)
Male	0.201*** (13.81)	0.201*** (13.81)
Age 25-29	0.683*** (35.45)	0.683*** (35.46)
Age 30-34	0.920*** (44.03)	0.920*** (44.06)
Age 35-39	1.017*** (46.49)	1.017*** (46.54)
Age 40-44	0.954*** (42.59)	0.954*** (42.62)
Age 45-49	0.855*** (40.66)	0.855*** (40.67)
Age 50-54	0.772*** (37.09)	0.772*** (37.11)
Age 55-59	0.670*** (32.08)	0.670*** (32.08)
Age 60-64	0.450*** (19.44)	0.450*** (19.44)
Age 65-69	0.160*** (6.78)	0.160*** (6.78)
Age 70-74	-0.157*** (-5.89)	-0.157*** (-5.90)
Age 75-79	-0.628*** (-22.48)	-0.628*** (-22.49)
Age 80+	-1.539*** (-45.30)	-1.539*** (-45.28)
Divorced	0.656*** (49.91)	0.656*** (49.92)
Widowed	0.538*** (38.92)	0.538*** (38.90)

Separated	0.661***	0.661***
	(43.49)	(43.48)
Single	0.381***	0.381***
	(20.09)	(20.08)
Couple	0.650***	0.650***
	(38.93)	(38.93)
Black	-0.364***	-0.364***
	(-8.83)	(-8.84)
Asian	-0.416***	-0.416***
	(-11.65)	(-11.64)
Hawaiian/Pacific Islander	-0.0167	-0.0171
	(-0.44)	(-0.45)
American Indian/Alaskan Native	0.252*	0.252*
	(1.75)	(1.75)
Other Race	0.0724	0.0718
	(1.62)	(1.60)
Multiple Races	0.220***	0.220***
	(7.08)	(7.09)
Hispanic	-0.748***	-0.748***
	(-15.44)	(-15.43)
Less Than High School	0.926***	0.926***
	(23.80)	(23.80)
Some High School	1.481***	1.481***
	(47.96)	(47.97)
High School Grad	1.048***	1.048***
	(48.71)	(48.72)
Some College	0.836***	0.836***
	(62.58)	(62.62)
Unemployed	0.331***	0.331***
	(29.06)	(29.07)
Homemaker	-0.0733***	-0.0733***
	(-2.92)	(-2.93)
Student	-0.685***	-0.685***
	(-30.56)	(-30.55)
Retired	0.0553***	0.0553***
	(6.07)	(6.07)
Unable to Work	0.363***	0.363***
	(26.48)	(26.47)
Real Income	-0.0000122***	-0.0000122***
	(-53.92)	(-53.86)
2017	-0.0107	-0.0101
	(-1.10)	(-1.02)
2018	-0.0171*	-0.0165*
	(-1.77)	(-1.69)

2019	-0.0293*** (-2.67)	-0.0288*** (-2.63)
2020	-0.0487*** (-3.93)	-0.0487*** (-3.89)
2021	-0.0935*** (-8.01)	-0.0932*** (-8.82)
2022	-0.164*** (-14.98)	-0.168*** (-14.51)
2023	-0.188*** (-5.76)	-0.193*** (-5.79)
Quarter 2	0.0115** (2.26)	0.0110** (2.16)
Quarter 3	0.00780 (1.14)	0.00750 (1.11)
Quarter 4	0.0151** (2.23)	0.0145** (2.14)
Constant	-2.552*** (-65.93)	-2.531*** (-62.86)
Observations	2,311,108	2,311,108

All models also include state indicators. These indicators were not included in the tables to conserve space.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Results

Flavored cigarette restrictions were found to significantly decrease cigarette use prevalence in both models ($p < 0.01$). Moreover, the inflation adjusted tax on cigarettes was found to significantly decrease cigarette use prevalence in both models ($p < 0.05$). However, the prohibition of smoking in private worksites was found to have an insignificant effect on the prevalence of adult cigarette use. Both regression models produce similar results, however model 2 is inclusive of all the key independent variables, including all the tobacco control policies and therefore model 2 minimizes the probability of an omitted variables bias. We used Akaike's information criterion (AIC) to evaluate the goodness of fit of the models. Model 2

yielded a slightly lower AIC than Model 1. This suggests that Model 2, which includes the additional two tobacco control policies, fits the data better and is the preferred model.

Using the estimates from Model 2, we simulated the effects of the Massachusetts flavored cigarette restriction on adult smoking prevalence rates in the state of Massachusetts. Specifically, we estimated the predicted probabilities of smoking in Massachusetts by altering the value of the Massachusetts cigarette flavor restriction from zero to one. The models indicated that the flavored cigarette restriction reduced smoking prevalence in Massachusetts by 1.372 percentage points (or an 11.89 percent reduction) between the period when the policy went into effect and the day the last individual responded to the survey in Massachusetts on January 24, 2023. The largest effect of the policy was right after implementation with smoking prevalence declining 0.885 percentage points (or 7.85% reduction) between 2020 and 2021.

Health Care Cost Savings

Because of research and data limitations, it is not yet possible to estimate total health care cost savings in each year following the implementation of a restriction on flavored cigarette sales. Since many smoking related diseases take years to develop, smoking related health care cost savings from the implementation of a restriction on flavored cigarette sales will be relatively small at first but will grow quickly over time. We calculate lung cancer, myocardial infarction and stroke, pregnancy/birth complications cost savings overall that result from the Massachusetts restriction on flavored cigarette sales. In addition, Medicaid cost savings from the flavored cigarette restriction were calculated. All the costs estimated are direct costs. The cost savings are aggregated cost savings and were not disaggregated by payer type (private vs. public insurance etc.). We utilize the BRFSS simulated reduction in adult smoking prevalence

that were attributable to the Massachusetts restriction on flavored cigarettes sales to calculate 1-year, 5-year, and 10-year cost savings in Medicaid spending and in the following smoking-attributable conditions: lung cancer, heart attack and stroke, and pregnancy/birth complications. The estimated health care cost savings are based on an economic model that was jointly developed by researchers at Tobacconomics, the Campaign for Tobacco-free Kids, and the American Cancer Society-Cancer Action Network.

The projected savings from fewer smoking-induced heart attacks and strokes, fewer smoking affected pregnancies and related birth complications, and fewer lung cancer cases show just some of the substantial savings from the smoking reductions induced by the Massachusetts policy.

The projected lung cancer cost savings result from adult smokers who quit due to the enactment of the cigarette flavor restriction. The lung cancer cost savings take into account the relative risk of developing lung cancer among quitters and the number of lung cancer deaths attributable to smoking (Chang et al., 2004; Khuder and Mutgi, 2001). The smoking-affected pregnancy and birth savings come from reductions in smoking among pregnant women that result from the enactment of the cigarette flavor restriction and corresponding reductions in smoking-related birth complications and related health care costs for their children in their first year of life (Miller et al., 2001). The heart attack and stroke savings result from adult smokers aged 35-64 who quit smoking due to the enactment of the cigarette flavor restriction and the reduction in health care expenditures that result from fewer heart attacks and strokes following the cigarette flavor restriction (Lightwood and Glantz, 1997; Kabir et al., 2008).

The projected state savings to the Massachusetts Medicaid program are estimated based on the number of adult Medicaid recipients in Massachusetts expected to quit due to the cigarette flavor restriction and the costs averted per quitting Medicaid recipient (Miller et al., 1998). Estimates for adults enrolled in Medicaid include the additional Medicaid enrollees due to expanded Medicaid eligibility as part of the Affordable Care Act as well as adults who were eligible under existing rules prior to the expansion of Medicaid eligibility. The Medicaid cost savings are calculated using per adult enrollee health care spending data and take into account the costs of newly eligible adult Medicaid enrollees separately from the previously eligible adult Medicaid enrollees as well as future projected cost increases. The enrollment projections and costs estimates were provided by Gideon Lukens and Breanna Sharer at the Center on Budget and Policy Priorities. The fraction of the Massachusetts Medicaid program's projected cost savings that would accrue to the state government are based on the state's Federal Medical Assistance Percentage (FMAP), calculated separately for newly eligible and previously eligible enrollees. The smoking related Medicaid expenditures is calculated by multiplying the smoking attributable fraction (SAF) for publicly funded health care in the state of Massachusetts (Miller, 1998) by the total Medicaid expenditures in Massachusetts. The SAF used (14.3%) is the most recent Massachusetts estimate in the literature, which is based on a national model that uses data from the National Medical Expenditure Survey (NMES) (Miller, 1998). The state share of Medicaid savings attributable to the enactment of the menthol cigarette restriction are calculated by multiplying the decrease in the number of Medicaid smokers due to the Massachusetts menthol cigarette restriction by the smoking-related Medicaid expenditures per Medicaid smoker and by the yearly reduced risk of disease post cessation. Predicted

probabilities derived from regression analyses using the BRFSS data are used to calculate the decrease in the number of Medicaid smokers due to the menthol cigarette restriction. The estimated smoking-related Medicaid expenditures per Medicaid smoker is calculated by dividing the smoking related Medicaid expenditures by the total number of Medicaid smokers in Massachusetts. The Massachusetts specific Medicaid expenditures attributable to smoking are inclusive of all smoking attributable healthcare costs (i.e., smoking attributable medical conditions) incurred by Medicaid recipients in Massachusetts. Smoking attributable medical conditions are cancer, emphysema, arteriosclerosis, heart attack, and stroke. The total number of Medicaid smokers is calculated by multiplying the estimated prevalence of smoking by Medicaid recipients by the number of Medicaid recipients in Massachusetts. Finally, the yearly reduced risk of disease post cessation is derived using estimates from the 1990 Surgeon General's report (Samet 1990).

Only the projected cost savings to the state government are provided below (Federal Medicaid cost savings are available upon request). Note that there may be overlap between Medicaid cost savings and savings from the other listed conditions.

All projected cost savings have been adjusted to 2021 quarter 1 dollars using the Consumer Price Index for Medical Care from the United States Bureau of Labor Statistics, with the exception of the Medicaid Cost savings which were adjusted using inflations measures from the Centers for Medicare and Medicaid Services. Future forecasted costs are estimated using the average of the differences between the annual medical inflation and annual inflation for all goods that occurred between the years 2015-2020.

Table 2a and 2b contain the 1 year, 5 year, and 10 year cost savings attributable to the Massachusetts cigarette flavor restriction.

Table 2a. Estimated Health Care Cost Savings from Select Conditions Attributed to the Massachusetts Menthol Cigarette Restriction

	1 Year Cost Savings	5 Year Cost Savings	10 Year Cost Savings
Pregnancy	$775,742	$3,984,738	$8,191,116
Heart attack and stroke	$3,298,846	$45,644,111	$113,761,026
Lung Cancer	$714,588	$21,657,348	$76,015,640
Total	$4,789,176	$71,286,197	$197,967,782

Table 2b. Estimated Medicaid Cost Saving Attributed to the Massachusetts Menthol Cigarette Restriction

	1 Year Cost Savings	5 Year Cost Savings	10 Year Cost Savings
Medicaid	$1,052,343	$15,651,763	$43,244,385

As expected, the cost savings are relatively modest in the first year after the policy but increase significantly over time. The accrued five-year cost saving for pregnancy, heart attack and stroke, lung cancer are $4.0 million, $45.6 million, and $21.7 million, respectively. The accrued five-year cost saving for Medicaid is $15.7 million.

Conclusion

Our research demonstrates that the Massachusetts restriction on flavored cigarette sales has had a significant impact on reducing smoking prevalence rates in Massachusetts. The reductions in smoking, in turn, have and will continue to reduce the incidence of tobacco-related diseases leading to lower smoking attributable healthcare expenditures. In our research

we estimate lung cancer, heart attack and stroke, pregnancy, cost savings that resulted from the Massachusetts restriction on flavored cigarette sales as well as Medicaid cost savings The one-year, five-year, and ten-year costs savings associated with birth/pregnancy complications, heart attacks and strokes, and lung cancers are $4.8 million, $71.3 million, and $198 million, respectively. Moreover, we estimated that the Massachusetts restriction on flavored cigarette sales saved the state Medicaid program $1.1 million in the first year after implementation and will save the state Medicaid program $15.7 million and $43.2 million five and ten years after implementation, respectively. For comparative purposes, $19.1 billion was spent on the Massachusetts Medicaid Program in FY2021, of which $2.96 billion was spent on newly eligible adults and $2.18 billion was spent on previously eligible adults. The state of Massachusetts spent $296 million on newly eligible adults in FY 2021 and $1.09 billion on previously eligible adults in FY2021, and the federal government paid the remainder. A first-year Medicaid cost savings of $1.1 million attributed to the flavored cigarette restriction represents approximately 0.08% of what the state of Massachusetts paid for adults as part of the Medicaid program in FY2021.

Caveats and Implications

In 2019, Massachusetts implemented a law prohibiting the sale of all flavored tobacco products, not just menthol cigarettes. Our estimates in this report quantify cost savings from restricting the sales of menthol cigarettes only. Additional healthcare cost savings would result from the prohibition of flavors on other tobacco and nicotine products. Unfortunately, existing research is not sufficient to calculate cost savings attributed to flavor policies for other tobacco and nicotine products.

Cigarette smoking has been causally linked to a large and ever-growing number of diseases. Substantial costs are associated with treating these diseases. We calculated lung cancer, myocardial infarction and stroke, pregnancy/ birth complications, and Medicaid cost savings that result from the Massachusetts restriction on flavored cigarette sales. We did not calculate costs savings for decreases in other conditions that may be impacted by smoking, such as asthma, and the MassHealth cost savings also do not account for all possible smoking-attributable conditions, therefore, our estimated health care cost savings are just a small fraction of the total health care cost savings that could be attributed to the policy.

The cost savings estimates assume that the effects of Massachusetts restriction of flavored cigarettes on smoking rates are the same across the different adult populations that were examined including: low-income adults (such as those on Medicaid), pregnant women, and older adults that are more likely to be impacted by lung cancer, stroke, and heart attacks as compared to young adults. To the extent that these groups respond more to menthol policies than adults in general, our cost saving estimates will be underestimates; the opposite will be true if these groups respond less to menthol policies. In addition, estimates used to calculate cost savings for the smoking attributable fraction and conditions associated with smoking (lung cancer, heart attack and stroke, and pregnancy complications) are based on national data from the literature and may differ slightly from estimates based on Massachusetts-specific claims data. Since Massachusetts has the highest healthcare spending per capita in the nation, partially due it its higher hospital (both inpatient and outpatient) utilization rate, it is likely that the cost savings included in this report are underestimates of true savings (Health Policy Commission, 2014).

Finally, our five- and ten-year cost savings estimates assume an underlying downward trend in cigarette smoking of two percent per year for adult smoking prevalence. This underlying downward trend allows for reductions in smoking in response to other tobacco control policies and in response to other tobacco control program activities. If the downward trend in smoking is steeper, then future reductions in smoking and its consequences in response to the restriction on menthol cigarettes will be smaller; the opposite will be true if the downward trend in smoking is flatter.

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