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To: [Liz Jacobson-Carroll <ljc@frcog.org>](mailto:ljc@frcog.org)

Date: 9/29/2023 12:48:07 PM

Subject: [EXTERNAL] - FW: Follow Up -Tobacco Updates - MORE!

Attachments: Evaluation of Statewide Flavored Tobacco Restriction.pdf
Study on the Implementatiof the Public Health Emergency Response to 2019 Outbreak.pdf

Dear Colleagues,

I write with additional information that may be of interest to those of you who attended or registered for the Tobacco Updatesworkshop earlier this month -- including the answers to several questions asked during the session. See below and attached -- and scroll further down for a previously sent email message with links to relevant content and contacts.

Liz

Q & A:

- Should we be enforcing the removal of the "new" products discussed today?
We do not recommend enforcement on the Non-Menthol Newport or Kool LUXE until the current issue works its way through the Chelsea Board of Health and any possible resulting litigation. When enforcement is recommended there will be a notification in the MHOA newsletter and on the website.
- Are the new Newport non-menthol cigarettes illegal or are they good to be sold in MA?
Until further notice we do not recommend any enforcement on the Newport non-menthol. (See above)
- Details about tobacco retailer's education. I know of resources, but how to enforce use.
There is no requirement that retailers participate in tobacco retailer education, with the exception of some municipalities in the Berkshires through the Tri-Town Health Department and most recently, the town of Medway. If your board would like to include mandated retailer education in their regulation, please contact [Sarah McColgan](#) for assistance.
- Has there been any analysis done on the state level regarding the effects of the temporary ban on the sale of all vapes that occurred a few years ago? Additionally, has there been analysis on the unanticipated consequences of the flavored tobacco ban?
See PDF's attached to email.

More info on cannabis : We held a Cannabis Updates training with Cheryl Sbarra on August 13. You can see the recording, PPT slides, and resources here: <https://frcog.org/tobacco-cannabis/>

More on delta 8 : The cannabis training mentioned above addressed emerging products like delta 8. View the training here: <https://frcog.org/tobacco-cannabis/>

From: Liz Jacobson-Carroll

Sent: Thursday, September 21, 2023 1:32 PM

To: Liz Jacobson-Carroll <ljc@frcog.org>

Subject: Follow Up -Tobacco Updates

Dear Colleagues,

Thanks to all of you for registering for the Tobacco Updatesession held on Wednesday, September 13th. Whether or not you were able to attend, you may want to reference the [Franklin-Hampshire Field Training Hub Resource Library page](#), where we've gathered links to video, slides and documents. Those of you who attended and requested CEUs will soon receive a separate email with a link to download your own certificate.

Answers to questions asked during the session are forthcoming, but if you have new questions regarding the content of the session, please contact one of the presenters

[Sarah McColgan](#), MHOA Tobacco Control Director

[Merridith O'Leary](#), Pioneer Valley Tobacco Coalition (PVTC) Coordinator

[Donna Bowman](#), PVTC Tobacco Control Officer

Staff members in health departments in the [Franklin-Hampshire Field Training Hub region](#) who are in need of guidance or training are encouraged to contact [Lead Trainer Bri Dupras](#).

Warmly yours,

Liz Jacobson-Carroll

Public Health Training & Permitting Coordinator



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Evaluation of a Statewide Flavored Tobacco Restriction on Use, Access, and Cessation Among Black and White Tobacco Users in Massachusetts

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Abstract

Purpose: To evaluate the impact of a statewide flavored tobacco restriction among Massachusetts residents who use menthol or flavored tobacco and to assess differences in impact between Black and White users, as the tobacco industry has targeted menthol to Black users.

Design: An online survey was distributed through a panel provider and household mailings.

Setting: Eleven Massachusetts communities with higher-than-state-average Black, Indigenous or People of Color populations

Subjects: Black (n = 63) and White (n = 231) non-Hispanic residents who used menthol or other flavored tobacco products in the past year.

Measures: Impact of the law on use, access, and quitting behaviors.

Analysis: Outcomes were assessed between Blacks and Whites using Pearson chi-square tests.

Results: Over half (53% of White, 57% of Black) of respondents believed the law made it more difficult to access menthol products; two-thirds (67% of White, 64% of Black) accessed menthol products in another state. Black users were significantly more likely to report purchasing menthol products off the street ($P \leq .05$). One-third (28% of White, 32% of Black) believed the law made it easier to quit, and one-third (27% of White, 34% of Black) completely quit in the past year.

Conclusions: Flavored tobacco restrictions may positively and equitably impact cessation. Cross-border access and off-the-street purchasing suggest the need for greater cessation support and underscore the importance of a national policy.

Keywords

tobacco control, racial minority groups, health policy, community, menthol tobacco, health disparities

Purpose

Historically, the tobacco industry has intentionally targeted menthol tobacco products to Black Americans through advertisement placement, price promotions, and music marketing.^{1–4} Studies have shown disproportionate point-of-sale tobacco marketing in Black neighborhoods⁵ and that inequity grows when looking at marketing of menthol tobacco; multiple studies have demonstrated more menthol advertisements, greater menthol availability, and lower menthol prices in communities of color.^{6–8}

The targeting of menthol tobacco products to Black Americans has contributed to disproportionately high menthol

use among Black smokers. Nationally, non-Hispanic Black (referred to throughout this article as Black) adults smoke

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menthol cigarettes at significantly higher rates than their non-Hispanic White (referred to as White) counterparts (76.8% of Black smokers usually use menthol compared to 24.6% of White smokers).⁹ Studies show that menthol cigarettes may be biologically more addictive and increase dependency more than non-flavored cigarettes in the general population.⁹⁻¹² This may lead to greater smoking intensity and more difficulty quitting. In Massachusetts (MA), people of color are 25% less likely to successfully quit than Whites, this inequity has persisted over decades (MA BRFSS).

Some localities and states have implemented restrictions on flavored and menthol tobacco sales, which have reduced the availability, marketing, and sales of restricted products and decreased use rates in youth and adults.¹³⁻¹⁵ In Ontario, Canada researchers found that two years after a menthol tobacco restriction took effect, menthol smokers reported more quit attempts (adjusted relative risk [ARR] = 1.45) and a higher likelihood of quitting (ARR = 2.08) than non-menthol smokers.¹⁶

On June 1, 2020, MA enacted a comprehensive, statewide flavored tobacco restriction entitled “An Act Modernizing Tobacco Control” that, in part, restricts the sale of all tobacco and vape products with flavors including menthol. Sales of these products are now allowed only in the few state-licensed smoking bars (currently 25 in MA) for on-site consumption. The law also prohibits retailers from advertising the sale of flavored tobacco and vape products.

In addition to including menthol among other restricted tobacco flavorings, several measures were taken to help ensure the law does not exacerbate inequities in enforcement. First, the law does not include a Purchase, Use or Possession (PUP) component (meaning it is not illegal to obtain or use flavored tobacco products), thereby requiring the tobacco industry be responsible for the distribution of its products, not shifting responsibility to individuals grappling with nicotine addiction.¹⁷ Second, the MA legislature assigned enforcement authority and gave funding to municipal boards of health, and thus, minimizing the potential for increased police presence due to the law. Third, the MA Tobacco Cessation and Prevention program (MTCP) worked with its state Quitline to develop a program specifically for users of menthol products to aid in cessation. Finally, the MA Police Chiefs Association distributed guidance to all municipal police departments outlining the enforcement parameters for the law and stressing that the law does not make it illegal for anyone to use or possess flavored tobacco products.

To date, few studies have examined the impact menthol sales restrictions have on racial and health equity, especially among the Black community that have been disproportionately targeted by the tobacco industry.¹³ Those that have, found the rationale for menthol tobacco sales restrictions were not well-understood or universally supported by Black smokers and Black young adults were more likely than other young adults to continue using flavored cigars after implementation of a flavored and menthol sales restriction.^{18,19}

This paper intends to begin to fill this gap in the literature by sampling areas of the state with higher-than-average Black, Indigenous, People of Color (BIPOC) populations to ensure BIPOC perspectives are adequately represented.

This study aims to understand awareness and attitudes towards the law among menthol and other flavored tobacco users in MA and examine the impact of the law on tobacco access and quitting behaviors, both intended by the law and possible unintended consequences, such as access to flavored tobacco products from other states or “off the street” sources. Furthermore, given the industry targeting of menthol tobacco towards Black communities and subsequent high rates of menthol use among this population, this study aims to examine any differences in outcomes between Black and White tobacco users who use menthol and other flavored tobacco products. We hypothesize that the law will make it harder for tobacco users to access menthol and flavored tobacco products and will have a positive impact on their quitting behavior.

Methods

Design

MTCP partnered with Market Street Research to create and disseminate an online survey. From July to September 2021, a 10-minute online survey was disseminated through an online panel provider as well as by direct mailings (with a link to the online survey) to individual households in the targeted communities.

Sample

The survey was disseminated to MA residents in 11 communities with higher-than-state average BIPOC populations: Boston, Brockton, Chelsea, Everett, Fall River, Lawrence, Milton, New Bedford, Quincy, Randolph, and Springfield. Additional inclusion criteria included: being 21 or older and having ever used at least one type of tobacco product (cigarettes, cigars/cigarillos, smokeless tobacco, or vape) within the past year.

The final survey consisted of up to 80 questions (both multiple-choice and open-response). It was available in English, Spanish, Portuguese, and Haitian Creole.

Measures

Demographics. Respondents were asked their age, household income, primary source of health care insurance, highest level of school completed, current gender identity, transgender or transgender experience, sexual orientation, race, ethnicity, and current employment status. See [Table 1](#) for response options.

Tobacco Use. For each tobacco product respondents indicated they have ever used in the past year, they were asked how long they have regularly used that product in their entire life, as well

Table 1. Demographics and Tobacco Use.

		White (N = 231)		Black (N = 63)	
		N (%)	95% CI	N (%)	95% CI
Age	21-34	70 (30)	[24.73, 36.52]	17 (27)	[17.51, 39.11]
	35-54	122 (53)	[46.38, 59.15]	29 (46)	[34.31, 58.21]
	55+	39 (17)	[12.57, 22.28]	17 (27)	[17.51, 39.11]
Income	Under \$25k	45 (19)	[14.87, 25.09]	16 (25)	[16.19, 37.43]
	\$25k-\$50k	48 (21)	[16.02, 26.49]	18 (29)	[18.84, 40.77]
	\$50k-\$75k	41 (18)	[13.33, 23.22]	15 (24)	[14.89, 35.74]
	\$75k + ^b	81 (35)	[29.20, 41.42]	12 (19)	[11.09, 30.56]
Education	High school or less	92 (40)	[33.73, 46.26]	24 (38)	[27.10, 50.46]
	Trade/technical/vocational	20 (9)	[5.61, 13.05]	10 (16)	[8.66, 27.01]
	Associate degree	34 (15)	[10.69, 19.90]	8 (13)	[6.32, 23.37]
	College degree or higher	85 (37)	[30.84, 43.19]	21 (33)	[22.91, 45.67]
Gender	Male	90 (39)	[32.90, 45.38]	18 (29)	[18.84, 40.77]
	Female	137 (59)	[52.87, 65.44]	42 (67)	[54.33, 77.09]
Transgender	Yes				
	No	225 (97)	[94.32, 98.94]	60 (95)	[86.38, 98.90]
Sexual Identity	Heterosexual	187 (81)	[75.37, 85.52]	53 (84)	[72.99, 91.34]
	LGBTQ+	44 (19)	[14.10, 24.16]	10 (16)	[8.66, 27.01]
Primary language spoken at Home	English ^a	230 (100)	[97.34, 100.17]	60 (95)	[86.38, 98.90]
	Other				
Health insurance	Private	117 (51)	[44.24, 57.03]	30 (48)	[35.78, 59.73]
	Medicaid/MassHealth	64 (28)	[6.32, 14.05]	17 (27)	[7.48, 25.20]
	Medicare	22 (10)	[22.32, 33.82]	9 (14)	[17.51, 39.11]
Employment	Employed (full time, part time or self-employed)	125 (74)	[67.54, 78.87]	38 (75)	[62.57, 83.81]
	Out of work/looking for work	27 (12)	[8.11, 16.52]	10 (16)	[8.66, 27.01]
Menthol use	Current (within 30 days)	160 (69)	[63.03, 74.87]	50 (79)	[67.69, 87.66]
	Within 1 year	202 (87)	[82.51, 91.16]	58 (92)	[82.34, 96.95]
Other flavor use	Current (within 30 days)	93 (40)	[34.14, 46.70]	23 (37)	[25.69, 48.88]
	Within 1 year	138 (60)	[53.30, 65.86]	34 (54)	[41.79, 65.69]
Product type used (within the past 30 days)	Cigarettes	166 (72)	[65.73, 77.28]	45 (71)	[59.23, 81.16]
	Cigar	63 (27)	[21.92, 33.36]	24 (38)	[27.10, 50.46]
	Smokeless	30 (13)	[9.21, 17.98]	7 (11)	[5.19, 21.50]
	Electronic vape product	109 (47)	[40.85, 53.62]	23 (37)	[25.69, 48.88]
Flavor of cigarettes used (within the past 30 days)	Unflavored (tobacco)	64 (39)	[31.48, 46.14]		
	Menthol or mint	102 (61)	[53.86, 68.52]		
Nicotine dependency	Dependent	147 (64)	[57.25, 69.57]	39 (62)	[49.54, 72.90]
	Less dependent	84 (36)	[30.43, 42.75]	24 (38)	[27.10, 50.46]
Geography	<30 min driving distance from another state*	67 (29)	[23.52, 35.17]	6 (10)	[4.10, 19.60]
	>30 min driving distance from another state*	164 (71)	[64.83, 76.48]	57 (90)	[80.40, 95.90]

^aRates for white and black respondents are significantly different at the P < .05 level.

^bRates for white and black respondents are significantly different at the P < .1 level.

as what flavor(s) they used most often in the past 30 days. See [Table 1](#) for response options.

State Law Opinion. Respondents were asked if they were aware of the new law prior to the survey, and whether they support it and why.

State Law Impact. Respondents were asked about perceived impacts of the law overall (see [Table 2](#) for response options)

and how the law has personally impacted them. Personal impact questions included if they switched products or flavors, if the law impacted their ability to access products, where they purchased products, and whether they accessed these products in or out of MA. See [Table 2](#) for response options.

Nicotine Dependency. Questions about nicotine dependency were adapted from the National Adult Tobacco Survey.²⁰ Respondents were asked if they ever wake up at night to

Table 2. Law Perceptions and Impact of the Law on Access.

	White (N = 231)		Black (N = 63)	
	N (%)	95% CI	N (%)	95% CI
Support for the New Law				
Strongly support/Somewhat support	50 (22)	[16.80, 27.42]	11 (17)	[9.86, 28.80]
Neutral	44 (19)	[14.48, 24.63]	18 (29)	[18.84, 40.77]
Somewhat oppose/Strongly oppose	135 (58)	[52.00, 64.61]	32 (51)	[38.76, 62.73]
Observed changes since the law took effect in Jun 2020				
People going to other states to purchase menthol/other flavored tobacco	147 (64)	[57.25, 69.57]	37 (59)	[46.41, 70.05]
Fewer advertisements for tobacco around the community	96 (42)	[35.39, 48.00]	32 (51)	[38.76, 62.73]
People selling/buying menthol or other flavored tobacco off the street	90 (39)	[32.90, 45.38]	27 (43)	[31.39, 55.15]
Fewer tobacco products for sale or on display inside of stores	77 (33)	[27.56, 39.65]	19 (30)	[20.18, 42.42]
People using menthol tobacco products	71 (31)	[25.13, 36.97]	18 (29)	[18.84, 40.77]
People using other flavored tobacco products	69 (30)	[36.07, 24.33]	15 (24)	[14.89, 35.74]
Less tobacco litter	31 (13)	[9.58, 18.46]	5 (8)	[3.05, 17.66]
Are you concerned about the potential for increased policing related to the menthol law?				
Yes	95 (41)	[34.97, 47.57]	28 (44)	[32.84, 56.68]
Impact of the law on respondent's tobacco access				
Made it much more/somewhat more difficult to access menthol products	117 (53)	[46.82, 59.92]	35 (57)	[44.89, 68.99]
Much more/somewhat more difficult to access other flavored products	69 (41)	[33.91, 48.63]	18 (44)	[29.88, 58.97]
Respondent's sources of access for tobacco products				
Menthol tobacco products from a store (adult only, convenience, supermarket) ^a	104 (65)	[57.33, 71.97]	18 (36)	[24.10, 49.89]
Menthol tobacco products from family or friends	17 (11)	[6.65, 16.44]	8 (16)	[8.07, 28.78]
Menthol tobacco products off the street*	17 (11)	[6.65, 16.44]	15 (30)	[19.03, 43.83]
Menthol tobacco products from other source	10 (6)	[3.30, 11.25]	8 (16)	[8.07, 28.78]
Other flavored products from a store	65 (70)	[59.90, 78.31]	13 (57)	[36.79, 74.39]
Other flavored products from family or friends	8 (9)	[4.20, 16.28]		
Other flavored products off the street				
Other flavored products from other source				
Out of state access				
Accessed menthol tobacco products in another state	107 (67)	[59.25, 73.71]	32 (64)	[50.11, 75.90]
Accessed other flavored tobacco products in another state	43 (46)	[36.45, 56.32]	6 (26)	[12.26, 46.76]

^aRates for white NH and black NH are significantly different at the $P < .05$ level.

have a tobacco product, whether they've had a strong craving to use tobacco products of any kind within the past 30 days, if they ever felt like they really needed to use a tobacco product within the past 30 days, if there was a time when they wanted to use a tobacco product so much they found it difficult to think of anything else, and if they felt restless and irritable after not using tobacco for a while. A latent class segmentation analysis was used to group respondents into two categories: more dependent and less dependent.

Change in Use Since COVID-19. For each tobacco product respondents used they were asked if they were using the product more or less since the start of the COVID-19 pandemic. See [Table 3](#) for response options.

Cessation. Respondents were asked about their quitting behaviors: if they have quit tobacco products since the start of COVID, if they intend to quit within the next year, reasons for wanting to quit or not wanting to quit.

Respondents were then asked about any barriers to quitting, what helped them quit (facilitators), and if the new law had impacted their ability to try to quit tobacco products and why. See [Table 3](#) for detailed response options.

Geography. Respondents were categorized as being close (< 30 min driving distance) to another state's border or further from another state's border ($\geq$ 30 min driving distance) depending on the community they reside in. Fall River, Springfield and Lawrence were categorized as close to another state's border.

Analysis

Descriptive statistics were calculated for all questions, and Pearson chi-square tests were used to assess differences between White and Black respondents who have used a flavored tobacco product in the past year (respondents who identified as a different race/ethnicity or who haven't used

Table 3. Cessation Outcomes.

		White (N = 231)		Black (N = 63)	
		N (%)	95% CI	N (%)	95% CI
Cigarette smoking habits since start of COVID-19 (among cigarette smokers)	A lot more + somewhat more	82 (41)	[31.3, 44.02]	30 (54)	[39.16, 64.07]
	About the same	71 (35)	[26.56, 38.88]	17 (30)	[19.11, 42.08]
	Somewhat less + a lot less	49 (24)	[17.34, 28.36]	9 (16)	[8.16, 27.16]
Quitting attempts	Quit attempt since the start of COVID	89 (39)	[32.49, 44.95]	29 (46)	[34.31, 58.21]
Completely quit (among those who ever had a quit attempt)	Completely quit using tobacco products	34 (27)	[19.81, 35.10]	12 (34)	[20.76, 50.92]
Quit intentions	Intend to quit tobacco within the next year	59 (30)	[23.98, 36.69]	18 (35)	[23.60, 49.05]
Impact of the new law on ability to try to quit tobacco products or perceived ability to try to quit	It has had no impact and I do not think it will impact my ability to quit using tobacco products	108 (63)	[55.71, 70.03]	30 (60)	[46.16, 72.41]
	It has made it easier for me or I think it will make it easier for me to quit using tobacco products	48 (28)	[21.86, 35.25]	16 (32)	[20.70, 45.87]
	It has made it harder for me or I think it will make it harder for me to quit using tobacco products	15 (9)	[5.30, 14.06]		
Methods used during most recent quit attempt (check all that apply)	Cold Turkey (stopped using tobacco products on your own)	72 (57)	[48.00, 64.99]	17 (49)	[32.99, 64.43]
	Tapering or decreasing use	55 (43)	[35.01, 52.00]	9 (26)	[13.98, 42.25]
	NRT or other medication	41 (28)	[20.51, 35.93]	12 (31)	[18.45, 48.08]
	Phone counseling, individual counseling, group counseling or texting programs	18 (14)	[9.07, 21.38]	6 (17)	[7.72, 33.06]
	None of the above	9 (7)	[3.62, 13.09]	5 (14)	[5.78, 29.85]
Barriers to quitting (since the law passed) (check all that apply)	I Did not experience any barriers	36 (28)	[21.21, 36.76]	11 (31)	[18.45, 48.08]
	Living in a household/community with tobacco use	28 (22)	[13.65, 27.50]	10 (29)	[13.98, 42.25]
	Not a pressing priority/did not want to quit/don't use regularly/other	34 (27)	[19.81, 35.10]	7 (20)	[9.74, 36.19]
	I Had withdrawal symptoms	21 (17)	[11.00, 24.03]	8 (23)	[11.83, 39.26]
	Mental health challenges/stress	17 (13)	[8.43, 20.49]	5 (14)	[5.78, 29.85]
	Lack of social support	10 (8)	[4.18, 14.04]	8 (23)	[11.83, 39.26]
	Lack of access to quality programs and services	9 (7)	[3.61, 13.90]	5 (14)	[5.78, 29.85]
	Difficult to get nicotine replacement therapy or other medications	7 (6)	[2.50, 11.14]		
	Food/job insecurity or other economic stressors	5 (4)	[1.45, 9.12]	5 (14)	[5.78, 29.85]
	Strained or ineffective relationships with healthcare providers	5 (4)	[1.45, 9.12]	5 (14)	[5.78, 29.85]
Resources that would be helpful in quitting tobacco use (check all that apply)	Experiencing racism/other discrimination				
	Support from friends or family	103 (45)	[38.32, 51.04]	26 (41)	[29.95, 53.59]
	Medication to help quit smoking	88 (38)	[32.07, 44.51]	22 (35)	[24.30, 47.28]
	Quitting with someone else	84 (36)	[30.43, 42.75]	26 (41)	[29.95, 53.59]
	Personalized coaching through the Massachusetts smokers helpline	74 (32)	[26.35, 38.31]	14 (22)	[13.61, 34.03]
	An app to help quit smoking	73 (32)	[25.94, 37.86]	21 (33)	[22.91, 45.67]
	Cold Turkey (quitting on your own)	71 (31)	[25.13, 36.97]	24 (38)	[27.10, 50.46]
	In-person support groups	60 (26)	[20.73, 32.00]	15 (24)	[14.89, 35.74]
	Online support communities/groups	60 (26)	[20.73, 32.00]	16 (25)	[16.19, 37.43]
	Getting help from a doctor nurse or other healthcare provider	53 (23)	[17.97, 28.80]	18 (29)	[18.84, 40.77]
	Help from a social worker/counselor/community health worker	34 (15)	[10.69, 19.90]	12 (19)	[11.09, 30.56]
	Don't know	29 (13)	[8.84, 17.49]	8 (13)	[6.32, 23.37]
	Reading printed or online info	28 (12)	[8.48, 17.01]	11 (17)	[9.86, 28.80]
	Help from a faith leader or community provider	14 (6)	[3.56, 9.99]	6 (10)	[4.10, 19.60]
	None of the above	12 (5)	[2.91, 8.95]		

flavored tobacco products in the past year were excluded from this analysis).

MA Department of Public Health Institutional Review Board (IRB) determined this study does not meet the definition of human subject research and does not require review by the IRB.

Results

Study Population

A total of 590 MA residents responded to the survey. The analysis sample consisted of 294 respondents (231 White and 63 Black) who used either menthol or flavored tobacco products in the past year. Demographic characteristics and tobacco use behaviors can be found in [Table 1](#). Most characteristics were similar between White and Black respondents; significant differences only existed for primary language spoken at home, proximity to the state border, and median household income.

Tobacco Use

Among the study population, cigarettes were the most frequently reported tobacco product used. White respondents had higher rates of use of other flavored tobacco products, 60% [53.3, 65.9] compared to 54% [41.8, 65.7] ([Table 1](#)). Black respondents reported significantly higher rates of menthol cigarette use (96% [84.35, 99.59] of Black and 61% [53.9, 68.5] of White cigarettes smokers use menthol).

Nicotine dependency status was similar between the two groups; 64% [57.3, 69.6] of White respondents and 62% [49.5, 72.9] of Black respondents were considered “more dependent” on nicotine.

Awareness and Support for the Law

[Table 2](#) contains responses to survey questions concerning respondents’ awareness and support for the law. Most respondents (88% White and 81% Black) reported they were aware of the law prior to taking the survey. Around half of respondents were either in support of the law or neutral.

Those in support of the law cited reasons such as the law protects consumers’ health and prevents youth from smoking. [Supplemental Table 1 \(Table S1\)](#) contains select responses to the open-ended survey questions. One respondent in support of the law wrote “I believe that this law was made to protect the consumer. I would like to quit and not use any of these products. Flavor products are thought to be fun. Making them unavailable to be purchased I believe will help to keep them out of the hands of children.” Those who were opposed cited reasons such as the law is an infringement on personal choice, sales of other substances (e.g., marijuana and alcohol) are legal, and people can travel to other states to buy restricted products. One respondent opposed to the law wrote “It hasn’t

stopped menthol cigarette smokers from smoking menthol cigarettes it really just makes people buy them out of state so MA loses the tax revenue”.

General Perceived Impact of the Law

[Table 2](#) also contains responses to survey questions concerning respondents’ perceptions of the impact of the law on general changes in the environment and behaviors of people around them. The most frequently cited perceived impact of the law among both groups (64% [57.3, 69.6] of White and 59% [46.4, 70.1] of Black respondents) was people going to other states to buy menthol/flavored tobacco. Other frequently cited impacts were seeing fewer tobacco advertisements around the community, and people selling menthol/flavored tobacco on the street. There were no significant differences in perceived impact of the law between White and Black respondents.

Tobacco Access

Finally, [Table 2](#) contains responses to survey questions concerning impact of the law on the respondents’ own tobacco access. Overall, many (86.7%) respondents reported the law made it somewhat or much more difficult to access all types and flavors of tobacco products.

One of the primary perceived impacts of the law was that people would travel to other states to purchase restricted products. Many (67% [59.3, 73.7] of White and 64% [50.1, 75.9]) of Black respondents) did in fact report travel out of state to purchase menthol products; these rates were lower for other flavored tobacco products. There were no significant differences between White and Black respondents in rates of out-of-state access.

The most frequently reported source of access for menthol, and other flavored tobacco products among both Black and White respondents was from a store (adult only, convenience, or supermarket). The survey did not specify if the store was located in state or out of state. However, some differences exist by race. Black respondents were significantly more likely than White respondents to report buying menthol products off the street. White respondents were significantly more likely to report buying menthol products from a store ([Table 2](#)).

Racial differences in sources of access may be partially modified by geography. Respondents of either race that live in communities further from another state’s border (≥ 30 min driving) were significantly less likely to report buying menthol products from a store and more likely to report buying off the street than those living closer to another state’s border (data not shown in tables). Significantly more White respondents lived in a community closer to another state’s border ([Table 1](#)). However, even after stratifying by geographic distance, differences by race remained. Among those who lived further from a state border, Black respondents remained significantly more likely to report the law made it more difficult to access

menthol products and were more likely to purchase these products off the street compared to White respondents.

Despite significant differences in sources of access by race, both Black and White respondents were equally concerned about increased policing due to the law; there was no significant difference by race (41% [35.0, 47.6] of White and 44% [32.8, 56.7]) of Black respondents reported concerns). As one Black respondent wrote “I’m also concerned that police presence in historically...disadvantaged areas will be policed more than upper-middle-income areas” (Table S1).

Cessation

Table 3 contains responses to questions regarding cessation behaviors. Since the start of the COVID-19 pandemic, which roughly coincides with law implementation, 16.1% of Black respondents reported using cigarettes a lot or somewhat less frequently, compared to 24.3% of White respondents (Table 3). Around one third of respondents stated that they intend to quit using tobacco products during the next year and one third believed the state law would make it easier to quit using tobacco (28% [21.9, 35.3] of White and 32% [20.7, 45.9] of Black respondents) (Table 3). Reasons for perceived ease in quitting include difficulty accessing tobacco products (“more of a pain to get them so less likely to go get them”) and desire to “obey the law”. However, most (63% [55.7, 70.0] of White and 60% [46.2, 72.4] of Black respondents) believed the law would have no impact on their quitting behaviors, stating that they can still access restricted products or will use unflavored products, or that if they decide to quit it will be a personal choice, not due to the law (“I am quitting for me and my health not the law”). Less than 10% of both groups believed that the law would make it harder to quit. Reasons for this included wanting products more (“you want what you can’t have”) and buying restricted products in bulk (“Because now I have to travel and I tend to bulk buy”) (Table S1).

Racial differences in quit attempts, successful quitting, and cessation methods were not statistically significant. However, Black respondents reported more types of barriers to quitting than White respondents; many of these barriers were related to environmental factors and social determinants of health, including experiencing racism, food/job insecurity, and strained or ineffective relationships with healthcare providers (Table S1). Facilitators to quitting looked more similar between groups. The most frequently reported facilitator among both groups was support from friends and family.

Discussion

Awareness and Support for Law

This study assesses the impact of the MA statewide flavored tobacco restriction on perceptions and behaviors of White and Black tobacco users. Overall, there was high awareness of the law among both groups. We found that almost half of

respondents either supported the law or were neutral. While slightly lower than national research from The Truth Initiative showing that most adults (56.4%) support a federal ban on menthol cigarettes,²¹ support for the law was still high among our study population of recent flavored tobacco users.

General Perceived Impact of the Law

The most frequently cited perceived impact of the law was people traveling to other states to purchase restricted products. We found that about 2 out of 3 respondents reported traveling out of state to purchase menthol and there were high rates of out-of-state travel for other products.

Tobacco Access

Since MA is small in landmass and many bordering states are a short drive away, there is a history of residents traveling to other states, primarily New Hampshire (NH), where base prices and excise taxes are typically lower, and there is no state sales tax, to purchase tobacco. For example, the average price per pack of cigarettes in MA is \$11.11 and the average price in NH is \$7.73.²² However, cross-border sales do not necessarily indicate higher tobacco use rates in MA; this survey did not quantify the frequency of out-of-state access, amount of tobacco purchased out-of-state, or individual tobacco use intensity. Furthermore, there is evidence to suggest initial cross-border sales increases following a policy change are not sustained; historical NH cigarette stamp data indicate an initial increase in cigarettes stamped immediately after MA increased its cigarette sales tax in 2013, but this increase was not sustained (NH Department of Revenue).

Another major finding that highlights an unintended consequence of the law was the difference between White and Black respondents in sources of access for menthol products, even among respondents in equal proximity to another state. White respondents were more likely to purchase menthol products from a store, and Black respondents were more likely to purchase products off the street. Some differences in access can be attributed to decades of systemic racism resulting in lower incomes and transportation barriers that may make it more difficult for Black respondents to access menthol and flavored products from another state.^{23,24} Furthermore, while Black tobacco users may be more likely to purchase off the street, there is no evidence to suggest that they are also more likely to illegally sell these products.

Cessation

Close to one third of respondents believed the law would make it easier to quit, and close to one third of those who made a quit attempt reported having completely quit tobacco products since the start of the COVID-19 pandemic (which occurred shortly before state law implementation). However, less than a quarter of respondents reported smoking cigarettes less since

the start of the pandemic; in fact, nearly half of respondents reported smoking somewhat or a lot more. This may be attributed in large part to increased stress from the economic and social impact of the pandemic, such as job loss, concerns about paying bills, and poor mental health, as documented in data collected from a large statewide covid impact survey conducted by the MA Department of Public Health in Fall 2020.²⁵ The percentage that reported smoking less was particularly low among Black smokers, who experienced disproportionate effects of the pandemic and who smoke menthol cigarettes at higher rates. The effects of the pandemic, in combination with the addictive qualities of menthol and cessation barriers felt among Black respondents, underscore the need for greater and tailored cessation support for this population.

Previous studies have shown that reduced availability of tobacco products and point-of-sale marketing can reduce relapse and spontaneous purchases, lending support to the eventual reduction of tobacco use as an outcome from this law.^{26,27} Though differences were not statistically significant, Black smokers reported higher rates of both quit attempts and successful quitting, yet also reported experiencing more types of barriers to quitting compared to Whites. There was a clear desire among Black smokers to quit tobacco, however, systemic barriers, such as structural racism and its impact on access to healthcare and other services may be impeding success.²⁸ Therefore, it is important for tobacco product restrictions to be paired with initiatives to help support tobacco users to quit.

MA takes a multi-pronged approach to support cessation among menthol and other flavored tobacco users who may be impacted by the law. The state law itself included a component that requires private insurers and MassHealth, the state's Medicaid program, to provide coverage for tobacco use cessation counseling and at least one generic FDA-approved tobacco cessation product at no out-of-pocket costs. MTCP is also engaged in quality improvement efforts to improve the MA Quitline through increasing provider awareness and providing patients with better information about what to expect when being referred. When the law took effect, the Quitline implemented a special program for menthol smokers that provides monetary incentives and targeted cessation support.

Limitations

There are some limitations to note. This study included a small sample overall ($n = 294$), and an even smaller sample size for Black participants ($n = 63$), so it is possible the analysis was underpowered to detect all differences between racial groups. This study was cross-sectional, so it is not possible to know whether self-reported quitting behaviors and other outcomes were sustained over time without continued surveying. However, existing research suggests menthol bans have led to increases in quit attempts and successful quitting even two

years post-policy implementation.¹³ Additionally, these findings may not be generalizable to the rest of MA as cities selected for inclusion are potentially different from other communities. Finally, the law went into effect shortly after the COVID-19 pandemic began, so tobacco use and cessation outcomes may have been impacted by the pandemic in addition to the law, and it was not possible to disentangle the extent that each factor individually impacted outcomes. Studies have shown evidence of increased smoking prevalence and increased quit attempts during COVID-19.²⁹

Future Directions

In terms of understanding unintended consequences of the law, the survey did not ask questions regarding access to cars and/or other transportation. Therefore, the finding that Black respondents were more likely to purchase flavored products off the street may have been due in part to participants' inability to travel out of state to purchase products. Additionally, several of the municipalities in this study had existing flavor restrictions (excluding menthol). Thus, menthol users (who are a greater percent Black) experienced a more abrupt change compared users of other flavors (who are a greater percent White). Finally, many questions asked were about perceptions related to the law, such as concern for increased policing, and additional data sources were not available for validation. Research exists that proactive policing policies disproportionately impact Black communities, and police stops alone can result in psychological distress (among other long-term consequences).^{30,31} The law does not grant enforcement authority to police, nor does it include possession or use penalties, and education outreach was made to local police departments about the parameters of the law to mitigate the potential for increased policing. Nevertheless, our study findings suggest that off the street tobacco sales are disproportionately impacting Black residents, and therefore, the possibility of increased policing remains. MA will continue to monitor this possible issue through resident surveys and continue to engage communities of color in dialogue and education around the law and provide greater cessation support.

“So What?”

What is already known on this topic?

- The tobacco industry has targeted menthol tobacco products to communities of color across the United States
- Existing studies demonstrate that menthol and flavored tobacco restrictions have reduced the availability and sales of these products

What this paper adds?

- This study suggests that comprehensive flavored tobacco restrictions may have a positive impact on quitting outcomes among Black non-Hispanic flavored tobacco users in Massachusetts, especially when coupled with programmatic efforts to support tobacco cessation.
- However, results also suggest some residents continue to access menthol and other flavored tobacco products in other states or off the street. These findings underscore the importance of continuing to monitor access and use over time, as well as the importance of the widespread passage of these policies throughout the country.

What are the implications for health promotion practice or research?

- Cross-border access and off-the-street purchasing suggest the need for greater cessation support targeted to menthol and flavored tobacco users and underscore the importance of a national flavored tobacco policy inclusive of menthol

Authors' Contributions

PH, JD, GS, MK, and HM conceived and designed the study. SG and JR acquired the data. JR was responsible for analyzing the data. HM, MK and GS interpreted the data. HM drafted the manuscript with input from MK and GS. All authors reviewed, revised, and approved the article.

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Ethical Approval

Massachusetts Department of Public Health (MDPH) Institutional Review Board (IRB) determined this study does not meet the definition of human subject research and does not require review by the IRB.

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Supplemental Material

Supplemental material for this article is available online.

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Original Research

Implementation and evaluation of the public health emergency response to the 2019 outbreak of e-cigarette and vaping product use—associated lung injury in Massachusetts, USA

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ABSTRACT

Objectives: In 2019, an outbreak of e-cigarette/vaping product use—associated lung injury (EVALI) across the United States was responsible for acute harm, hospitalizations, and mortality among individuals using vape products, including youth and young adults. The objective of this study is to describe and evaluate the public health surveillance and emergency response activities that occurred in Massachusetts during the 2019 EVALI outbreak.

Study design: Descriptive process and policy evaluation.

Methods: Between September and December 2019, the Massachusetts Department of Public Health temporarily removed access to e-cigarettes in stores, conducted tobacco retailer educational activities, and promoted tobacco cessation communications. The public health response was monitored through online adult panel surveys, in-school youth surveys, retailer compliance checks, and existing tobacco control program surveillance.

Results: Massachusetts residents indicated high awareness of the EVALI outbreak and the corresponding public health response. Tobacco retailers were compliant with the temporary state prohibition on the sale of e-cigarettes. In response to reduced access to vaping products in stores, both adult and youth survey respondents reported reduced use, increased quit attempts, or complete e-cigarette cessation.

Conclusion: Emergency action undertaken by state public health programs and other governmental agencies corresponded with reduced availability of e-cigarettes and an increase in self-reported quit behaviors. Existing public health infrastructure at the state and local levels in Massachusetts facilitated an environment in which emergency and permanent protective measures could be implemented.

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Introduction

Electronic cigarettes (e-cigarettes) and electronic nicotine vaping devices have emerged as an alternative to combustible tobacco products among youth and adult users over the past several years. In 2019, half of Massachusetts high school (HS) youth (50.7%) reported any lifetime use of e-cigarettes, and 32% reported current use of e-cigarettes.¹ Although these products are known for their popularity among youth, adult e-cigarette use is also on the rise. In Massachusetts, although 6.9% of adults overall reported current use of these products, the use of these products is higher among

younger adults: 24.5% of adults aged 18–24 years reported being current users of e-cigarettes.²

Youth use of e-cigarette and nicotine vaping devices (although containing fewer harmful components than combustible tobacco) is of public health concern as nicotine has definitively been determined to be a highly addictive substance that can adversely harm the developing adolescent brain.^{3–9} Although the long-term health effects of e-cigarettes continue to be under study, evidence of acute harm attributable to e-cigarettes occurred in 2019, when the Centers for Disease Control (CDC) announced investigation into several reported cases of e-cigarette and vaping product use—associated lung injury (EVALI) in the United States. By September 11, 2019, the CDC reported 380 confirmed cases of lung injury associated with the use of e-cigarettes and six deaths.¹⁰

During this time, several states and localities including Massachusetts began to take proactive steps to address the EVALI outbreak (Fig. 1). The Commissioner of the Massachusetts

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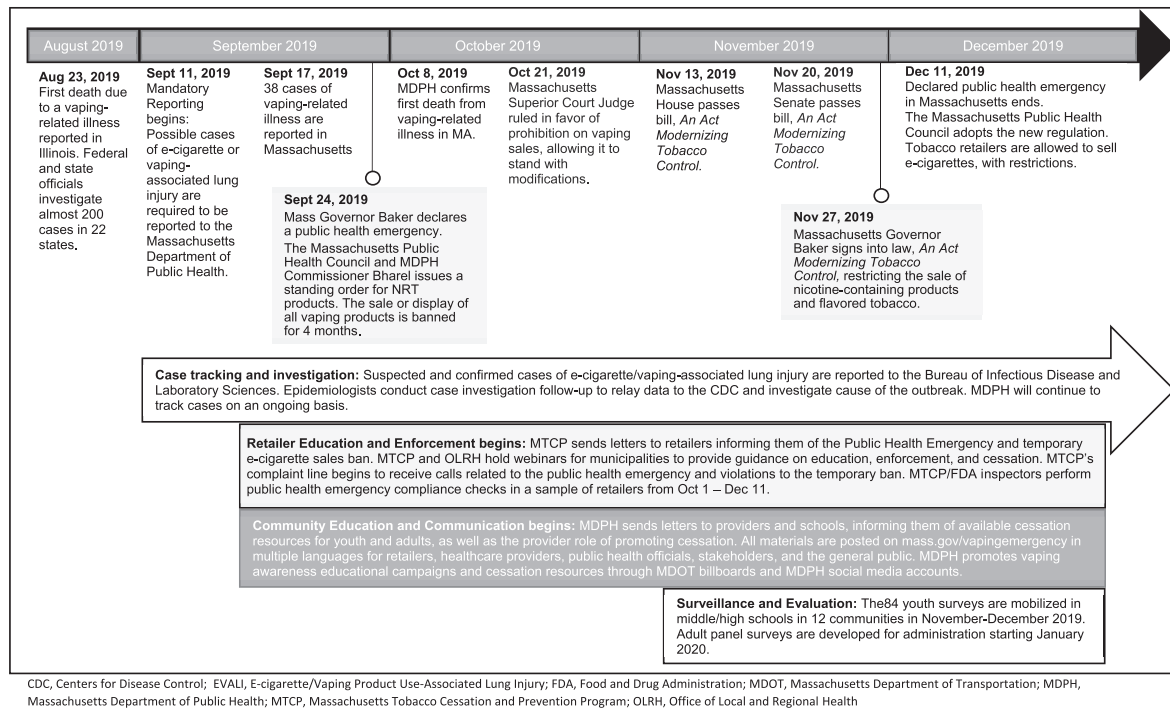


Fig. 1. Timeline of the Public Health Emergency Response to the EVALI outbreak in Massachusetts, August to December 2019.

Department of Public Health (MDPH) required all healthcare providers in the state to report all diagnosed or suspected cases to the Bureau of Infectious Disease and Laboratory Sciences.¹¹ On September 24, 2019, Massachusetts Governor Baker declared a public health emergency amid reports of EVALI cases in the state.¹² As a part of this emergency declaration, the MDPH Commissioner, with approval from the Governor and the Massachusetts Public Health Council, issued a temporary prohibition on the sale and display of all flavored and unflavored, nicotine and marijuana/tetrahydrocannabinol (THC) vaping, and e-cigarette products. Emergency action taken in the state of Massachusetts sought to prevent acute harm, predominately among youth users, by temporarily removing all vaping products from stores while the causes of lung injury were unknown and under investigation. Concurrent with the temporary ban, the MDPH Commissioner issued a standing order for the dispensing of over-the-counter nicotine replacement therapy (NRT) products at pharmacies to help those looking to quit their use.

To evaluate the impact of the EVALI outbreak and the corresponding public health emergency on youth and adult e-cigarette and tobacco use in Massachusetts, the Massachusetts Tobacco Cessation and Prevention Program (MTCP) tracked a number of activities relating to the state's public health response. This article will describe the activities carried out by the MDPH in concert with several state agencies, legislators, schools, and public health and medical professionals across the state during the EVALI outbreak; the impact of these activities on adult and youth tobacco and vaping behavior; and implications for future emergency responses undertaken by public health departments and agencies.

Methods

MTCP used several existing data sources and conducted primary data collection to assess the impact of the public health response on adult and youth access, use, and cessation of vaping products (Table 1).

Data sources

Process measures

MTCP evaluation staff tracked education-based process measures, including educational materials sent out to retailers, healthcare providers, schools, and the general public at large about (1) the declared public health emergency, (2) the temporary prohibition on the sale and display of vaping products in stores, and (3) the NRT Standing Order. MDPH and MTCP also aimed to raise awareness and provide information about the risks of vaping through promotion in the community and online platforms, such as the Mass.gov and the MakeSmokingHistory.org websites. Website analytics including number of page views and number or percent of unique visitors were used to assess engagement with online materials.

Retailer compliance

Fifteen MTCP-funded "Board of Health" (BOH) programs regularly perform educational and enforcement activities (e.g. inspections, compliance checks) in tobacco retailers in 165 Massachusetts communities. In funded communities, tobacco program enforcement agents visited retailers and performed routine educational visits to ensure retailers were complying with state and municipal regulations. MTCP program staff also identified communities that had a large total number or a large proportion of retailers selling vape products to begin to prioritize enforcement activities for MTCP/FDA (Food and Drug Administration) inspectors. These inspectors visited a random sample of 500 retailers to evaluate compliance with the temporary state prohibition.

A "Vaping Products Compliance Check" form was created to track inspection activities. Forms included the following measures: establishment name and address; store type (convenience store, liquor store, pharmacy, grocery store, tobacconist, vape shop, bar, other); status of the store, if vape shop (open, out of business, closed at the time of business); and whether store was in compliance with the ban (yes, no). If the store was not in compliance,

Table 1
Evaluation framework for the public health emergency response during the 2019 EVALI outbreak in Massachusetts.

Topic area	Evaluation question	Data source	Measures
Process measures			
Education	What activities were done by the MDPH and MTCP to educate retailers, healthcare providers, schools, and individuals about the PHE?	Letters Webinars Educational visits Online materials	What guidance was provided by MDPH and MTCP? Who received this guidance?
	What activities were done by MDPH and MTCP provide information about the risks of vaping?	MakeSmokingHistory.org Mass.gov/VapingEmergency “The Dangers of Vaping”	Webpages Communication activities
Outcome measures			
Access in the retail environment	Did retailers comply with the Public Health Emergency vaping prohibition?	Vaping Products Compliance Checks	Is this store in compliance with the ban on vaping products (there are no vaping products for sale or on display)? Were any violations found?
	Could youth access products in the retail environment during the PHE?	Retailer Education Visits Youth Vaping Survey	As a result of this ban, has it been more difficult for you to get vape products?
	Could adults access products in the retail environment during the PHE?	Adult Panel Survey	First, how did the temporary ban on the sale of vape products in Massachusetts impact your ability to access vape products? During the temporary ban on the sale of vape products in Massachusetts did you go to another state to get vape products?
Changes in use and behavior	Have youth changed the way they access products as a result of the PHE or the EVALI outbreak?	Youth Vaping Survey	As a result of this ban, and news that people are getting sick from using vape products, have you done any of the following to change the way you use vape products?
	Have adults changed the way they access products as a result of the PHE or the EVALI outbreak?	Adult Panel Survey	How has the temporary ban on the sale of vape products in Massachusetts impacted your use of vape products? As a result of the temporary ban on the sale of vape products in Massachusetts did you switch to using or increase your use of any conventional tobacco products?
Cessation	Have youth attempt to quit or cut down use of vaping products as a result of the PHE or EVALI outbreak?	Youth Vaping Survey	As a result of this ban, and news that people are getting sick from using vape products, have you done any of the following to change the way you use vape products?
	Have adults attempt to quit or cut down use of vaping products as a result of the PHE or EVALI outbreak?	Adult Panel Survey	As a result of the temporary ban on the sale of vape products in Massachusetts, did you use any of the following methods to help you quit the use of vape products?
Awareness of the risks of vaping and the state public health response to EVALI	Are youth aware of the emergency ban on the sale/display of vaping products?	Youth Vaping Survey	Were you aware that this ban on the sale of vape products existed in Massachusetts?
	Are youth aware of the risks of vaping?	Youth Vaping Survey	During the past 30 days, have you seen or heard any information about the risk of using vape products? During the past 30 days, have any of the following people talked to you about the risks of using vape products?
	To what extent have individuals engaged with online information or resources around the EVALI outbreak?	Mass.gov/VapingEmergency MakeSmokingHistory.org	Pageviews Unique visitors to page

EVALI, e-cigarette/vaping product use–associated lung injury; MDPH, Massachusetts Department of Public Health; MTCP, Massachusetts Tobacco Cessation and Prevention Program; PHE, public health emergency.

enforcement staff recorded information about the violation: product brand (JUUL, blu, smok, vuse, etc.), reasons for non-compliance (not aware of ban, not aware of what products were included in the ban, disagreed with the ban, other), and other actions done during the visit. Three MTCP/FDA inspectors performed these checks beginning October 1, 2019, until the end of the emergency (December 11, 2019).

The84 youth survey

MTCP funds The84, a collection of youth groups across the state that engage in a variety of tobacco prevention activities including

peer education of tobacco and vape industry tactics, promoting local policy action, surveying youth and adults about tobacco, and changing social norms around tobacco use. Chapters from The84 conducted in-school youth surveys to assess access and use of prohibited products during the public health emergency. Surveys contained questions on tobacco product use (cigarettes, cigars, e-cigarettes, blunts, and smokeless tobacco), student awareness of the state ban (yes/no), difficulty of obtaining products due to the ban, and changes made to the way youth use and access vape products (obtain from different places, use less often, thinking about quitting or quit, switching to other products). Data collection

occurred in a convenience sample of nine HSs, four middle schools (MSs), one middle/HS in 12 different communities across the state between November and December 2019, using paper and online surveys developed by MTCP evaluation staff.

Adult use panel survey

In December 2019, MTCP contracted with Market Street Research to conduct an online panel survey of adults who vape and use tobacco, with data collection occurring from January to February 2020 to obtain timely information around the use of e-cigarettes during the EVALI outbreak and the impact of the public health emergency ban on adult use, access, and cessation of vape products. Online panel surveys use a pool of adults who have volunteered to be surveyed, with data collection occurring relatively quickly using a larger sample of respondents than traditional data collection methods.¹³ Survey questions included tobacco use (product type, flavors) and impact of the temporary sale prohibition on the use, access, and cessation of vaping products (went to another state, use products less, made a quit attempt or quit, switched to other products). Measures also included self-reported difficulty accessing vape products (much more difficult, somewhat more difficult, no impact, and no access) and methods of cessation (cold turkey, tapering, counseling, medication, and other). Both adult and youth surveys were deemed exempt from review by the MDPH Institutional Review Board.

Analysis

To describe public health activities that occurred during the declared public health emergency, counts and proportions were calculated for that 16-week timeframe in 2019 (“September 24 to December 11”). Descriptive statistics (counts and proportions) were also calculated for youth and adult surveys. All descriptive analysis was performed in R Studio 3.63.¹⁴

Results

Process measures

MDPH conducted extensive educational activities using mailings, online communications, billboards, and social media. Letters were sent to all licensed tobacco retailers in Massachusetts informing them of the vape sales prohibition due to the state-declared public health emergency. Educational materials were posted on mass.gov/vapingemergency, with translations provided in English, Spanish, Portuguese, Haitian Creole, Simplified Chinese, and Vietnamese. MDPH promoted adult and youth communications campaigns about e-cigarettes/vaping products via “The Dangers of Vaping” webpage on MakeSmokingHistory.org, Mass.gov, Department of Transportation billboards, and MDPH social media accounts.

Webpage analytics demonstrate increased engagement with online communications on the public health emergency and the risks of vaping. During the public health emergency, the “Dangers of Vaping” page on MakeSmokingHistory.org received 59,086 pageviews, with 80.1% of pageviews representing unique visitors. In comparison, the campaign webpage received only half as many views between May and Aug 2019 (25,903 pageviews and 79.1% unique visitors). Traffic to mass.gov/vapingemergency sharply increased upon the announcement of the public health emergency on September 24, 2019. Between September 1 to September 23, the mass.gov vaping webpage received 730 pageviews compared to 2432 pageviews received between September 24 – Sep 30 (90.7% unique visitors).

Table 2

Educational and enforcement activities performed in Massachusetts during the EVALI outbreak, September–December 2019.

Measures	Compliance checks (N = 315)		MTCP BOH education visit (N = 1022)	
	N	%	N	%
Communities	19		117	
Funded	6	31.6	117	100.0
Unfunded	13	68.4	0	0.0
Product type				
Nicotine/tobacco	6	100.0	—	—
THC/marijuana	0	0.0	—	—
Store type				
Convenience/gas	174	55.2	641	62.7
Drug store/pharmacy	1	0.3	2	0.2
Liquor store	52	16.5	195	19.1
Grocery store	23	7.3	73	7.1
Mass merchandiser	5	1.6	14	1.4
Tobacco/vape shop	46	14.6	54	5.3
Hookah lounge	0	0.0	0	0.0
Bar or restaurant	1	0.3	0	0.0
Other	13	4.1	43	4.2
Education completed				
Yes	—	—	1012	99.0
No	—	—	10	1.0
In compliance				
Yes	309	98.1	891	87.2
No	6	1.9	131	12.8
Resolved (yes)	6	100	131	100

BOH, Board of Health; EVALI, e-cigarette/vaping product use–associated lung injury; MTCP, Massachusetts Tobacco Cessation and Prevention Program; THC, tetrahydrocannabinol.

Retailer compliance

Tobacco retailers were largely in compliance with the temporary prohibition on the sale of e-cigarettes/vaping products. Funded BOH programs completed 1022 educational visits in 117 funded communities, with 87.2% (n = 891) of visited retailers found to be in compliance with municipal and state tobacco control regulations (Table 2). Although educational visits during this time cover all regulations broadly (i.e. did not solely measure compliance with the ban), some BOH agents noted in an open-text field that a store was in compliance with the temporary prohibition (n = 55). High compliance was also observed in the sample of retailers visited by MTCP/FDA enforcement staff. FDA staff completed 315 checks in six funded communities and 13 unfunded communities between October 1 to December 11, 2019. Only six retailers were non-compliant during this period for a non-compliance rate of 1.9% (Table 2). Of the non-compliant retailers, 50% were selling a vaping product, and 66% were selling e-liquids or pods.

Self-reported outcomes among adult panel survey respondents

Among adult survey respondents who reported ever vaping (n = 602), 60% reported past 30-day use of cigarettes, and 56.8% reported past 30-day use of e-cigarettes/vapes (Table 3). About half of adult respondents (47.3%) reported that the ban made it more difficult to access vape products, and 32.7% said they had not accessed products since the ban began. However, 39.2% of adults reporting going to another state to access vape products.

In direct response to the temporary prohibition on the sale of vaping products, 30.7% of adult respondents reduced the use of vape products, and 20.9% indicated that they quit vaping (Table 3). However, data also show that 39.2% of adult users switched to conventional tobacco. Among those who made a quit attempt, the most common means of cessation were cold turkey (59.8%), tapering (24.4%), and use of NRT (13.4%).

Table 3

Access, use, and cessation of vaping products by Massachusetts adult panel survey respondents, 2019.

Adult panel survey measures ^a	N = 602	%
Past 30-day use of tobacco products among ever vapers^b		
Cigarettes	361	60.0
Cigars	117	19.4
Vapes	342	56.8
Smokeless tobacco	42	7.0
None in the past 30 days	69	11.5
How did the temporary ban on the sale of vape products in Massachusetts impact your ability to access vape products?		
Made it much more difficult but I was still able to access them	155	25.7
Made it somewhat more difficult but I was still able to access them	130	21.6
Had no impact I continued to access vape products	120	19.9
I have not accessed vape products since the ban began	197	32.7
During the temporary ban on the sale of vape products in Massachusetts, did you go to another state to get vape products?		
Yes	236	39.2
No	366	60.8
How has the temporary ban on the sale of vape products in Massachusetts impacted your use of vape products?		
I did not make any change	291	48.3
I use vape products slightly less often	111	18.4
I use vape products much less often	74	12.3
I quit using vape products	126	20.9
As a result of the temporary ban on the sale of vape products in Massachusetts did you switch to using or increase your use of any conventional tobacco products?		
Yes, switched or increase use of conventional tobacco products	231	38.4
No	378	62.8
Other	5	0.8
Did you use any of the following methods to help you quit the use of vape products?^b (n = 246)		
Cold turkey (stopped using vape products on your own)	147	59.8
Tapering or decreasing use	60	24.4
Phone counseling (e.g. Massachusetts Smokers Helpline)	4	1.6
Individual counseling	13	5.3
Group counseling	15	6.1
Texting programs	9	3.7
Nicotine replacement therapy (i.e. NRT: patch, gum, lozenge, nasal spray, inhaler)	33	13.4
Other medication such as Varenicline (Chantix) or Bupropion (Zyban, Wellbutrin) SR	10	4.1
Switched to conventional tobacco products	6	2.4
Had already quit tobacco or vape products before ban	5	2.0
None	8	3.3
Other	3	1.2

^a Data collection occurred in January and February of 2020.^b Respondents could choose multiple answers, percentages do not total to 100%.

Self-reported youth e-cigarette use, access, and cessation

Among HS youth respondents, 29.7% indicated ever use of e-cigarettes and vapes, and 12.1% indicated past 30-day use (Table 4). Of HS youth who use or have used vape products (n = 850), 19.4% indicated the temporary prohibition made it more difficult to obtain products. Youth survey respondents also reported changing the way they use products, including increased cessation (Table 4). Among HS youth users, 36.2% indicated using vape products less often, 22.6% indicated that they were thinking about quitting vape products, and 21.9% quit vape products because of the ban. However, 11.9% of youth users reported switching to conventional tobacco.

Surveyed youth also reported high awareness of the emergency ban: 79.3% of HS youth and 67.3% of MS youth were aware of the ban on vaping products, and 85.7% of HS youth and 78.7% of MS youth had seen information about the risks of vape products during past 30 days. Among HS students (n = 4082), 71% indicated that someone talked to them about the risks of vaping, with the most common responses being parent/guardian (42.9%), teachers (40.4%), and doctors (21.4%). Similar results were observed among MS youth respondents.

Discussion

In contrast to much of the published literature that focuses on the clinical manifestations of EVALI, this article documents the

programmatic work undertaken within a state health department during the EVALI outbreak, making it a novel contribution to the evidence base. This paper complements Wiens et al.'s 2021 article on the Minnesota Department of Health's response to EVALI, which largely focuses on the role of the state's public health laboratory in case investigation and substance testing.¹⁵ The present article describes how Massachusetts state public health prevention programs pivoted and used existing resources to respond to an emergency situation. Emergency public health actions undertaken in Massachusetts during the EVALI outbreak were associated with reduced availability of e-cigarettes and vaping products in the retail environment and corresponding vaping and tobacco use behavior changes among both adult and youth users.

Compliance check data indicate that retailers were in compliance with the temporary ban on the sale and display of e-cigarette products, with only a 1.9% violation rate among visited retailers. As Massachusetts has a strong history of local tobacco control policy within municipalities, tobacco retailers may be more prepared to respond to required changes in the sale or display of tobacco and vaping products. Strong retailer engagement (e.g. letters, in-person visits) likely facilitated the rapid implementation of the temporary prohibition on the sale of vaping products and high retailer compliance rates. Existing MTCP infrastructure including surveillance data (e.g. retailer lists) and funded enforcement and education personnel allowed for the provision of direct technical assistance to ensure awareness and compliance with the emergency ban.

Table 4

Impact of the public health response on youth use, access, and cessation of vaping products, November to December 2019.

Survey measures	High school youth			Middle school youth		
	Overall		Among users (%)	Overall		Among users (%)
	N	%		N	%	
Current use (past 30 day)	4148			1419		
Cigarettes	168	4.1		21	1.5	
Cigars	207	5.0		20	1.4	
Vapes	502	12.1		33	2.3	
Blunts	392	9.5		28	2.0	
Smokeless tobacco	112	2.7		16	1.1	
Aware of the ban	4135			1414		
Yes	3277	79.3		952	67.3	
No	858	20.8		462	32.7	
As a result of this ban, is it more difficult for you to get vape products?	4065			1401		
I do not use vape products	3215	79.1	n = 850	1303	93.0	n = 98
Yes	165	4.1	19.4	29	2.1	29.6
No	488	12.0	57.4	44	3.1	44.9
Not sure	197	4.8	23.2	25	1.8	25.5
As a result of this ban, have you done any of the following to change the way you use vape products?^a	4088			1406		
No, I do not use vape products	3425	83.8	n = 663	1341	95.4	n = 65
Yes, I get vape products from different places	206	5.0	31.1	27	1.9	41.5
Yes, I use vape products less often	240	5.9	36.2	15	1.1	23.1
Yes, I am thinking about quitting vape products	150	3.7	22.6	14	1.0	21.5
Yes, I have quit using vape products	145	3.5	21.9	17	1.2	26.2
Yes, I use different brands of vape products	128	3.1	19.3	20	1.4	30.8
Yes, I have switched to using other tobacco products	79	1.9	11.9	19	1.4	29.2
No change	19	0.5	2.9	2	0.1	3.1
Other	32	0.8	4.8	8	0.6	12.3
Seen information about the risks of vape products during past 30 days	4131			1411		
Yes	3542	85.7		1110	78.7	
No	589	14.3		301	21.3	
Talked to me about risks of using vape products in past 30 days^a	4082			1398		
No one talked to me about the risks	1187	29.1		421	30.1	
My parent/guardian	1751	42.9		607	43.4	
My teacher	1650	40.4		546	39.1	
My doctor	874	21.4		255	18.2	
My school nurse	381	9.3		137	9.8	
My friend	857	21.0		234	16.7	
Another person (The84, family member, school employee)	164	4.0		83	5.9	
Sources of media ^b	64	1.6		47	3.4	

^a Respondents could choose multiple options, percentages do not add up to 100.^b Media represent three collapsed categories: (1) TV, internet, radio advertisements; (2) news media; (3) social media.

Youth and adult survey data describe a range of adaptive behavior changes when access to vape products is temporarily removed from stores. Without access to e-cigarettes in stores, most youth (63.8%) either vaped less often, thought about quitting, or quit the use of vape products. On the other hand, most adults (67.2%) continued to access and use vape products, including a subset of adults who traveled to other states to obtain these products. More adults compared with youth (38.4% vs 11.9%) reported switching to or increasing their use of conventional tobacco products because of the prohibition, which may reflect that 60% of adult vapers also reported dual use of cigarettes, in contrast to youth, who reported relatively low use of conventional tobacco products. These results closely mirror behavior changes seen among college-aged vapers in California during the EVALI outbreak, including switching back to combustible tobacco, cutting back on e-cigarette or vape use, or only using during social situations.¹⁶

Given that a range of behavioral adaptations occur in response to a sudden change in the tobacco and nicotine retail landscape, the public health response must anticipate these behavior changes and provide resources that help individuals to reduce or prevent acute harm. As both youth and adult users reported making a quit attempt, it was important to promote, offer, and remove barriers to cessation resources through multiple channels and settings. Therefore, the promotion of cessation resources among schools and

healthcare providers, in addition to the NRT standing order, which facilitated over-the-counter access to NRT in pharmacies, were essential components of the public health emergency response to support individuals in their quit attempts. The use of NRT has been demonstrated to aid in quit attempts and promote both short- and long-term tobacco cessation.¹⁷

Coordination between state agencies to promote communication and educational materials in multiple places and channels resulted in high awareness of the emergency sales ban among both HS and MS youth, with the majority of youth also reporting seeing information on the risks of vaping. Most youth reported receiving information on the harms of vaping from teachers, doctors, and advertisements, which reflects promotion done by MDPH in those channels. These findings support results from other studies that demonstrate awareness of EVALI was nearly universal, given extensive coverage from prominent information channels, such as friends, family, news outlets, and social media feeds.^{16,18–20} One study demonstrates a possible association between widespread reporting on the EVALI outbreak and a reduction of e-cigarette sales, further suggesting that users may make a quit attempt or turn to alternative products if their preferred product causes harm.²⁰

Collectively, our results suggest that governmental response to emergency public health events requires coordination among

multiple stakeholders (including state agencies, funded local public health programs, healthcare providers, schools, and legislators) to create an informed public health response, effectively disseminate information across the state, and implement and enforce emergency state-level policy. Investment in public health programs on the state and local levels—programs that typically aim to prevent health risk behaviors, promote health-sustaining behaviors, and reduce the burden of chronic diseases—can also then be leveraged to support swift policy response in the event of an acute public health emergency.

Limitations

There are several limitations of note. Enforcement metrics are likely an undercount of all activities that took place in retailers across the state. Vape retailer compliance checks were largely conducted in unfunded communities to support the absence of enforcement infrastructure in these communities, and it is likely that true violation rates may have been even lower in funded communities. Youth and adult surveys are convenience samples and are not necessarily representative of all adults and youth who vape; however, these surveys help provide timely sources of information to help adapt and evaluate possible policy responses as well as inform future intervention activities. The evaluation data are descriptive in nature, do not isolate any single policy effect, and cannot be used to draw causal conclusions. For instance, awareness and risk of the EVALI outbreak may have led to some of the reduced use or quit attempts observed in our data sources, absent of the promotion of cessation supports.

Overall, these findings provide novel information about the youth and adult response to the outbreak of e-cigarette/vaping-associated lung injury in Massachusetts. State and local government response to widespread threats to health can impact how individuals likewise choose to respond. Reductions in store access and availability can lead to reduced vape product use and quit attempts among both adult and youth users, highlighting the importance of providing accompanying cessation supports, which, if ongoing, can be shifted toward the prevention of youth vaping. Government or agency response to public health emergencies should take a multipronged approach that addresses environmental conditions, such as widespread access to potentially life-threatening products, while providing increased access to free treatment options. Mass awareness of EVALI could allow health agencies to leverage public concerns about these products and help move tobacco and nicotine-using individuals along the continuum of change toward complete cessation. These actions should be complemented by local and state policy action that limits easy youth access to flavored, high-nicotine e-cigarette and vape products to continue addressing the youth vaping epidemic beyond the EVALI outbreak.

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Ethical approval

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Competing interests

None declared.

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