# Impact of the Massachusetts Menthol Ban on Perceptions and Cigarette Use Behavior at a Large Safety-net Hospital: A Longitudinal Survey and Qualitative Study

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# Abstract

**Background.** Menthol cigarettes have had a profound adverse effect on public health. On June 1 2020, Massachusetts became the first state to restrict the sale of all flavored tobacco products, including menthol cigarettes. In this longitudinal study, we sought to understand how individuals in our hospital system who smoke menthol cigarettes perceived the Massachusetts menthol ban and if their perceptions and smoking behavior changed over time.

**Methods.** We undertook a longitudinal survey and qualitative study (n=27), starting 1-month pre-ban (4/15-5/31/2020) and continuing 6-months post-ban. Pre-ban questionnaires assessed participants' perceptions of the ban and probed their anticipated smoking behaviors after the ban. The post-ban assessments (1- and 6- months) probed how perceptions and smoking behaviors changed post-ban. We also elicited suggestions to mitigate unintended consequences of the ban that might undermine intended policy effects.

**Results.** Participants were 37% female, 56% Black, and 96% Medicaid-insured. Perceptions of how individuals viewed the ban were dynamic. Many discussed how they smoked less because of the ban, although their smoking behavior was largely influenced by their ability to still obtain menthol cigarettes. Individuals suggested promoting tobacco treatment interventions to help people affected by the ban and a national ban to circumvent out-of-state travel.

**Conclusions.** Banning the sale of menthol cigarettes improves smoking-related health disparities. To be most effective, healthcare workers must capitalize on this moment to promote tobacco treatment and states must ensure that tobacco treatment programs are readily accessible to individuals affected by the ban.


# Introduction

Menthol cigarettes have had a profound adverse effect on public health.(1, 2) Menthol cigarettes increase youth initiation of smoking, make cigarettes harder to quit, and cause disproportionate death among Black Americans. Between 1980 and 2018 menthol cigarettes were responsible for 378,000 premature deaths.(3)

The US 2009 Family Smoking Prevention and Tobacco Control Act banned cigarettes with characterizing flavors, but exempted menthol.(4) Since 2011, menthol cigarette sales have increased.(5) Among individuals who currently smoke cigarettes, 30% of Whites compared to 85% of Blacks smoke menthol cigarettes.(6) Studies also show a preference for menthol cigarettes among people who identify as lesbian, gay, and bisexual, individuals with mental health problems, and socioeconomically disadvantaged populations.(7) Targeted marketing by the tobacco industry is implicated in the disproportionate use of menthol observed among these individuals.(8, 9)

Based on evidence establishing the harm of menthol tobacco products, in April 2021, the FDA proposed product standards to ban menthol as a characterizing flavor in cigarettes and ban all characterizing flavors, including menthol in cigars.(10–13) Simulation modeling to project the impact of a US menthol ban suggests that by 2050, the relative reduction in smoking prevalence would be 9.7% overall and 24.8% for Blacks. (14, 15)

While waiting on the FDA rule, on June 1 2020, Massachusetts became the first state to restrict the sale of all flavored tobacco products, including menthol cigarettes. We sought to understand how individuals hospitalized at Boston Medical Center (BMC), a large safety-net hospital, perceived the Massachusetts menthol ban and whether their perceptions and smoking behavior changed over time. We first identified the rate of adult use of menthol cigarettes among hospitalized individuals at BMC in the year before the Massachusetts menthol ban. Understanding how our socioeconomically disadvantaged population perceives the menthol ban and how it influenced their smoking behaviors is critical not only in helping them to stop smoking, but also in informing other states as they prepare for the anticipated FDA rule. We therefore undertook a longitudinal study, starting 1-month pre-ban and continuing for 6 months post-ban to look at individuals' perceptions and experiences of the Massachusetts menthol ban and elicit suggestions to mitigate unintended consequences of the ban that might undermine intended policy effects.

## Methods

# Electronic Health Record (EHR)

We compared demographics between hospitalized individuals who smoke menthol vs. non-menthol cigarettes in the year before the Massachusetts menthol ban took effect. To identify this cohort, we used the BMC Clinical Data Warehouse, which consolidates data from the EHR, to identify adults (age ≥ 18 years) who smoke cigarettes, were seen by BMC's Tobacco Treatment Consult (TTC) service (standard of care for hospitalized individuals who smoke cigarettes) (16), and were admitted between May 31, 2019 - Jun 1, 2020. We abstracted from TTC consultation notes that capture data on menthol cigarette use (menthol, non-menthol, or both); menthol cigarette use is only captured in EHR through TTC inpatient consultation notes. We summarized categorical variables using frequency with percentage and performed chi-squared analyses for between group comparisons, with two-sided p-value less than 0.05 considered significant.

# Longitudinal study

# Recruitment and Enrollment

We telephoned a convenience sample of 35 adults who smoked menthol cigarettes from April 15-May 31 2020, identified from 2 sources: (1) a list of hospitalized individuals seen by BMC's TTC service and (2) a list of individuals seen in the outpatient BMC Tobacco Treatment Center. Eligible participants were: (1) ≥ 18 years old, (2) able to speak English, (3) currently smoking menthol cigarettes (as recorded in the

tobacco treatment specialists' notes) (4) in agreement to participate in pre-ban, 1-month, and 6-month surveys/interviews, and (5) able to provide informed consent. Twenty-seven individuals agreed, gave verbal consent, and enrolled. We compensated individuals up to $75: $25 for pre-ban survey/interview, $25 for 1-month post-ban interview, and $25 for 6-month post-ban survey/interview. Our Institutional Review Board approved this study.

# Questionnaires

Study staff administered questionnaires by telephone. Baseline assessments included demographics and cigarette use characteristics. To compare how smoking behaviors and perceptions changed over time, pre-ban and 6-month post-ban questionnaires assessed purchasing and use of tobacco products, and perceptions of the ban.

# Qualitative Interviews

Two research team members with no clinical relationships with participants conducted the semi-structured interviews. Responses were audio-recorded and transcribed. The pre-ban interview guide was designed to identify participants' perceptions of the Massachusetts menthol ban, elicit their opinions on why the ban was enacted, and to probe their anticipated smoking behaviors after the ban went into effect. The 1-month and 6-month post-ban guides were designed to probe how perceptions and smoking behaviors changed over time and to elicit suggestions on how to strengthen the ban.

# Data analyses

Basic descriptive statistics were calculated using SPSS (v18) and R (v. 4.1.2) to summarize questionnaire responses. We analyzed transcripts using inductive content analysis (17, 18) by performing unstructured coding to allow for identification of new themes. Two team members reviewed transcripts independently and developed a preliminary coding matrix. The two team members then independently reviewed all transcripts and through comparison and iterative discussion, revised and added codes until consensus on codes and summary categories was reached. We finalized categories, grouped themes in each category, and identified quotes that best highlighted individual themes. Supporting statements are identified by participant number.

## Results

# EHR data

In the year before the ban, 51% (410/806) of hospitalized adults who currently smoked used menthol cigarettes. Among Black individuals who smoke, 68% (213/313) used menthol cigarettes; among White individuals who smoke, 37% (155/421) used menthol cigarettes. There were significant differences in Black race [52% (213/410) vs 25.3% (100/396), $p < 0.001$], Hispanic ethnicity [13.2% (54/410) vs 5.1% (20/396, $p < 0.001$], and being Medicaid-insured [80% (317/410) vs 69% (281/396, $p < 0.001$], between individuals who smoked menthol versus non-menthol cigarettes, respectively (Table 1).

Table 1
Comparison of demographics and smoking characteristics between individuals who smoke menthol and non-menthol cigarettes (June 1, 2019 to May 31, 2020)

| | **Total** | **Menthol** | **Non-Menthol** | **p-value** |
|---|---|---|---|---|
| **Adults seen by the Tobacco Treatment Team** | 806 | 410 | 396 | |
| **Age in years**, mean (SD)* | 53.6 (15.0) | 52.8 (14.0) | 54.4 (15.9) | 0.13 |
| **Female Sex** n (%) | 326 (40.4%) | 167 (40.7%) | 159 (40.2%) | 0.92 |
| **Race** n (%) | | | | **< 0.001** |
| Black | 313 (38.8%) | 213 (52.0%) | 100 (25.3%) | |
| White | 421 (52.2%) | 155 (37.8%) | 266 (67.2%) | |
| Other | 9 (1.1%) | 3 (0.7%) | 6 (1.5%) | |
| Unknown | 63 (7.8%) | 39 (9.5%) | 24 (6.1%) | |
| **Hispanic/Latino Ethnicity** n (%) | 74 (9.2%) | 54 (13.2%) | 20 (5.1%) | **p < 0.001** |
| **Medicaid Insurance*** | 598 (74%) | 317 (80%) | 281 (69%) | **P < 0.001** |

*Medicaid: *Includes individuals covered by Medicaid, Medical Assistance, or any kind of government-assistance plan for those with low incomes or a disability, as well as those who have both Medicaid and another type of coverage, such as dual-eligible individuals who are also covered by Medicare*

# Longitudinal study: quantitative data

Participants who completed baseline assessments were similar in demographics to patients who smoke menthol cigarettes at BMC (Table 2). Fifty-two percent (14/27) completed both pre-ban and 6-month assessments, which were used to make pre-ban and 6-month comparisons. Table 2 shows characteristics of individuals completing pre-ban and 6-month assessments.

Table 2
Characteristics of individuals participating in baseline and 6-month longitudinal analysis

| Characteristics | Participants completing Baseline assessments (n = 27) | Participants completing 6-Month assessments (n = 14) |
|---|---|---|
| **Mean Age (SD)** | 52 (12.4) | 56 (10.1) |
| **Female** | 10 (37%) | 7 (50%) |
| **Race** | | |
| Black | 15 (56%) | 11 (79%) |
| White | 9 (33%) | 3 (21%) |
| Other | 4 (15%) | 1 (7%) |
| **Hispanic Ethnicity** | 5 (19%) | 1 (7%) |
| **Medicaid Insurance** | 26 (96%) | 14 (100%) |
| **Education** | | |
| Less than high school | 11 (41%) | 5 (36%) |
| High school/GED | 7 (26%) | 4 (29%) |
| More than high school | 8 (30%) | 4 (29%) |
| **Experiencing homelessness** | 9 (33%) | 3 (21%) |
| **Divorced/separated, widowed, never married** | 24 (89%) | 12 (86%) |
| **Unemployed** | 26 (96%) | 13 (93%) |
| **Yearly household income before taxes** | | |
| $0-$34,999 | 25 (92%) | 13 (93%) |
| > $35,000 | 1 (4%) | 1 (7%) |
| Prefer not to answer/Don’t know | 1 (4%) | 0 (0%) |
| **Smoking characteristics** | | |
| Years smoked (SD) | 33 (14.5) | 36 (13.6) |
| Smokes daily | 19 (70%) | 9 (64%) |
| Smokes 10 or more cigarettes a day | 15 (55%) | 7 (50%) |

| Characteristics | Participants completing Baseline assessments (n = 27) | Participants completing 6-Month assessments (n = 14) |
|---|---|---|
| Importance of quitting smoking | | |
| Very important/important | 25 (93%) | 12 (86%) |
| Neutral | 0 (0%) | 0 (0%) |
| Low importance/not important | 2 (7%) | 2 (14%) |
| Motivation to quit smoking | | |
| Very motivated/motivated | 18 (67%) | 9 (64%) |
| Somewhat/Slightly motivated | 6 (22%) | 2 (14%) |
| Not at all motivated | 3 (11%) | 3 (21%) |
| Confidence to quit smoking | | |
| Very confident/confident | 11 (41%) | 7 (50%) |
| Somewhat/Slightly confident | 13 (48%) | 6 (43%) |
| Not at all confident | 2 (7%) | 1 (7%) |
| Confidence to quit smoking menthol | | |
| Very confident/confident | 11 (41%) | 5 (36%) |
| Somewhat/Slightly confident | 11 (41%) | 8 (57%) |
| Not at all confident | 3 (11%) | 1 (7%) |
| Quit attempt in past 12 months | 18 (67%) | 9 (64%) |
| Contemplation Ladder (SD) | 6.8 (3.3) | 9.1 (3.1) |
| Mean Fagerstrom score (SD) | 4.4 (2.5) | 4.7 (2.8) |
| Menthol use exclusively | 20 (74%) | 12 (86%) |
| Other tobacco product use | 1 (3.7%) | 0 (0%) |

# Purchasing and use behaviors of non-menthol, menthol cigarettes, and other tobacco products

The Figure shows anticipated vs actual behaviors in menthol cigarettes (Panel A), non-menthol cigarettes (Panel B), and other tobacco product use (Panel C), which were generally concordant.

**Purchase and use of menthol cigarettes.** Compared to pre-ban, 71% (10/14) reported purchasing and smoking fewer menthol cigarettes at 6-months. Most participants who continued to smoke menthol cigarettes post-ban began purchasing their cigarettes out of state: Pre-ban, 78.5% (11/14) bought menthol cigarettes in Massachusetts; 6-months post-ban 78.5% (11/14) bought menthol cigarettes out of state.

**Use of non-menthol cigarettes.** Pre-ban, 71% (10/14) smoked menthol cigarettes exclusively; at 6 months, 2 individuals started to smoke non-menthol cigarettes; 8 continued to smoke menthol cigarettes exclusively.

**Other tobacco product purchase and use**. Pre-ban, none of the 14 individuals purchased and used other tobacco products; at 6 months, one individual started to purchase and use e-cigarettes.

**Daily cigarette use and quit attempts**. The number of individuals who smoked cigarettes daily was 64.3% (9/14) pre-ban, and 57% (8/14) 6-months post-ban. Two individuals stopped smoking altogether and one participant reported an increase in smoking. Fifty percent (7/14) stated that they made at least one quit attempt due to the ban (Table 3).

Table 3
Smoking behavior of the menthol ban at 6-months

| **Impact of ban on encouraging behavior change in use of tobacco products** | |
|---|---|
| | 6m post-ban behavior |
| **The ban encouraged me to stop using all tobacco products** | |
| Strongly agree | 4 (29%) |
| Agree | 4 (29%) |
| Neither agree nor disagree | 1 (7%) |
| Disagree | 3 (21%) |
| Strongly disagree | 2 (14%) |
| **The ban made me want to stop using all cigarettes** | |
| Strongly agree | 1 (7%) |
| Agree | 4 (29%) |
| Neither agree nor disagree | 2 (14%) |
| Disagree | 5 (36%) |
| Strongly disagree | 2 (14%) |
| **The menthol ban has led me to make a quit attempt** | |
| Yes | 7 (50%) |
| No | 7 (50%) |

# Perceptions of the menthol ban

At 6 months, 36% (5/14) strongly agreed/agreed and 57% (8/14) strongly disagreed/disagreed with the Massachusetts menthol ban (Table 3). Compared to pre-ban, 6 participants felt more positive (e.g., went from ‘neutral’ pre-ban to ‘agree’ post-ban), 6 had no change in opinion, and 2 felt more negative (e.g., went from ‘disagree’ to ‘strongly disagree’) about the ban at 6 months.

At 6 months, 43% (6/14) strongly agreed/agreed and 57% (8/14) strongly disagreed/disagreed with a national menthol ban. Compared to pre-ban, 7 participants felt more positive, 5 had no change in their opinion, and 2 felt more negative about a national ban at 6 months.

# Longitudinal study: qualitative data

We divide this section into key themes from 1) pre-ban analysis that assessed individuals’ perceptions of the Massachusetts menthol ban and opinions on why the ban was enacted, 2) longitudinal assessment

that examined how participants' anticipated and actual smoking behavior and perceptions changed over time, and 3) participants' suggestions on how to make the ban more effective.

Pre-ban analysis

**1. Perceptions of Massachusetts Menthol Ban.** Individuals gave reasons as to why they perceived the ban as positive or negative:

Positive: Ban would help individuals to stop smoking: *"The menthol ban is really a good idea. …a lot of people are actually thinking about quitting."* (P21)

Positive: Ban would benefit the community: *"The young people smoke Newports. …[post-ban] they won't be able to get 'em. I think that will help not only the young people, but the seniors as well as the middle age." (P25)*

Positive: Ban would undue an injustice to the Black community: *"It irritates me that I can't buy a pack, but I know that they've been marketed, unfortunately, for people of color, so it's possible that injustice will no longer be happening. It's a good thing." (P26)*

Negative: Ban is an overreach of government policy: "*I think they should leave the menthol cigarettes alone… They're trying to delegitimize cigarettes in all. I don't agree with it. I think it's an overreach of government." (P24)*

Negative: Ban unfairly targets Black communities by limiting choices for products they enjoy: *"There's certain type of alcohols that African American drink that are being taken off the shelf also. The African American smoke menthols more than anyone else. …That's where I see discrimination." (P6)*

Regardless of how individuals perceive the ban, individuals discussed four main reasons why the ban might be rendered ineffective:

1) Unsanctioned selling of menthol cigarettes: *"It's not gonna stop people having cigarettes. They're gonna just go to New Hampshire, get cigarettes and sell 'em by the pack, by the carton." (P4)*

2) Switching from menthol cigarettes to non-menthol cigarettes: *"If you go to the store, and they don't got your brand, you go buy what they got on the shelf,—cuz most people who are addicted, they gonna smoke." (P22)*

3) Traveling to nearby states to purchase menthol cigarettes: *"I would drive and get me a couple of cartons then come home…I would take a ride if I wanted the cigarettes." (P8)*

4) Manipulating substances to make a menthol cigarette: *"people [will] figure out some way [of] smoking their menthol cigarettes. They buy some menthol products and put 'em on some non-menthol cigarettes and turn them into menthol cigarettes. Everybody come up with something." (P19)*

**2. Opinions for why the ban was enacted.** Three themes arose from participants' opinions on why the menthol ban was enacted: 1) general interest in promoting health: **"***It might be because they don't want the people in Massachusetts to be smoking like they do." (P25)*; 2) financial motivation: *"I don't really think it's to save people. It's probably about money. …Maybe there's somebody who's got their money in the non-menthol cigarettes, and they want all the game on non-menthol cigarettes." (P23);* and 3) to reduce the youth smoking epidemic: *"Mostly, I think, it's for the younger people" (P15).*

# Longitudinal analysis

We followed participants (n = 14) for 6 months post-ban to see if their smoking behaviors and perceptions changed over time. We categorize this section based on the smoking behavioral intentions of individuals in response to the proposed ban. Individual stories are below and in Appendix 1.

**1. Participants who thought the ban would lead them to stop smoking.** Five participants thought the ban would lead them to stop smoking; 3 initially had positive and 2 had negative perceptions of the ban. Post-ban, 4 reported stopping or smoking less.

# Participant 27: Individual who as anticipated, cut down on smoking post-ban

Pre-ban: P27 held a favorable outlook on the ban: *"it's something that should've been done a long time ago. I think it will ultimately help people to quit smoking altogether. It's doing that for me."*

1-month post-ban: P27 continued to have positive perceptions and smoked fewer cigarettes: *"It's positive. I think more people, including myself, are smoking less because of the ban."* However, she still smoked menthol cigarettes: *"A family member might go, and I'll just buy a few from them."*

6-months post-ban: P27 had quit smoking: *"I slowed down drastically, and one day, forget about it. I stopped right then."* She continued to hold a favorable outlook: *"It's impacting people in a way where people are wanting to quit. …I've been wanting to do it, and so it gave me the push that I needed."*

# Participant 15: Individual who continued to smoke despite thinking the ban would make her quit

Pre-ban: P15 held negative perceptions: *"I think it's discrimination."* Despite disagreeing, she had planned to quit: *"I will not be smoking them because I only smoke menthol. …Soon as June 1st come, I'm done. I'm not spending my money on something I don't like."*

1-month post-ban: P15 still disagreed with the ban: *"I'm not in agreement …if they're gonna ban one, they should ban them all."* Yet she attributed the ban to encouraging her to stop smoking: "*I think it positively impacted me. …I have other reasons for quitting. It has encouraged me a lot."*

6-month post-ban: P15 still smoked cigarettes and perceived the ban ineffective: *“I don't think it's doing no good. …if there's somebody going [to New Hampshire], I'll go, and get a couple of packs.”*

**2. Participants who thought they would still smoke post-ban.** Six participants thought they would smoke post-ban; 5 had negative perceptions and 1 was indifferent. Two cut back or quit; 4 continued to smoke.

# Participant 10: Individual who stopped/cut back, despite thinking she would continue to smoke post-ban

Pre-ban: P10 was unhappy about the ban: *“We’re just getting a little closer to communism.”* When asked if her smoking would change post-ban, she responded: *“It will change. I’ll have to go to New Hampshire.”*

1-month post-ban: P10 cut back on her smoking: *“I moved much further away, so it’s harder for me to get the menthol. It’s a blessing because it’s helping me breathe better. I have COPD.”* She sought tobacco treatment post-ban: *“After the state stopped selling menthol, it was harder to get and more expensive, so I had to start smoking non-menthol. I don’t enjoy it. I had my doctor prescribe patches and lozenges.”*

6-month post-ban: P10 felt the ban had facilitated cutting down, “*I don’t smoke as much, and I don’t smoke as often.”* She still felt that the ban was an overstep of policy: *“it’s an individual choice as far as I’m concerned.*”

# Participant 17: Story of a participant who as anticipated, continued to smoke post-ban

Pre-ban: P17 was angry about the ban: *“Evidentially, I don’t have that choice anymore. I have a problem with that.”*

1-month post-ban: He reported he would get menthol cigarettes by *“any means necessary.”*

6-month post-ban: P17 still held a negative perception of the ban: *“I hate it. …It’s harder to get menthol cigarettes. It costs more money to buy cigarettes.”* He was still smoking menthol cigarettes: *“somebody on my job goes out-of-state to go get them, and I buy them from them.”*

**3. Participant who was unsure how the ban would affect smoking behavior.**

# Participant 18: Individual who smoked less because of the ban

Pre-ban: P18 was unsure of how the ban would affect his smoking: *“I don’t know. I’ve been smoking Newports for over 10 years.”*

1-month post-ban: P18 was in favor of the ban: *“I strongly agree with them. I’m gonna get healthier. Like it’s motivating me… if I don’t have menthol, I’d rather not smoke.”*

6-months post-ban: P18 continued to have positive perceptions: *"The good thing that I'm gonna quit smoking. The bad part is that I can't smoke Newports, but I am very happy with the menthol decision."* P18 reported smoking 5 non-menthol cigarettes a day, down from 10 menthol cigarettes, and believed a complete ban on cigarettes might have helped him quit altogether: "*Yeah, but if there was no more other cigarettes, I would stop. It woulda been awesome, but they gave us a second choice."*

# Participant suggestions

Participants discussed ways to make the ban more effective:

**1. Ban all cigarettes**: *""Why not ban all cigarettes? It just doesn't make sense, just do it across the board." (P1, Pre-ban).*

**2. Ensure tobacco treatment interventions during implementation of the menthol ban**: *"If people are addicted to something, you have to go get help to stop doing it. While putting the ban out there, you need to have a little bit more advertisement… 'We have these places to help stop smoking. We can help you through this.'" (P4, Pre-ban)*

**3. Implement a nationwide ban**: *"If you gonna ban it, you gotta ban it anywhere…cause people really traveling to get it." (P16, Pre-ban)."*

# Discussion

Our study demonstrated that individuals held a wide range of views as to why the Massachusetts menthol ban was enacted, but few perceived it was to promote their own health. While individuals had varying perceptions of the ban, many discussed how they smoked less because of the ban. Our longitudinal analysis showed that individuals' smoking behavior was dynamic, often influenced by their ability to still obtain menthol cigarettes post-ban. Individuals provided suggestions on how to make the ban more effective. We frame our discussion on how agencies might best support individuals directly affected by the ban.

About half of individuals who smoke cigarettes at our hospital use menthol cigarettes. Modeling suggests that among menthol smokers, a nationwide ban would lead to a 20% reduction in combustible tobacco use, with half switching to e-cigarettes and half quitting nicotine altogether.(13) In our study, only one individual reported switching to e-cigarettes. Over half continued to smoke menthol cigarettes, though most reported smoking fewer menthol and non-menthol cigarettes.

Following Ontario's ban on menthol cigarettes, individuals who smoked menthol cigarettes had increased quit attempts and success compared to those who smoked non-menthol cigarettes.(19) We found that 50% of individuals completing 6-month follow-up reported that the ban led them to make a quit attempt. Many individuals in our study discussed how they only enjoyed smoking menthol cigarettes and therefore smoked less post-ban. Other factors that facilitated smoking fewer cigarettes included co-occurring health issues and inconvenience of the ban (e.g., no access to transportation for out-of-state travel).

Several individuals perceived the Massachusetts menthol ban as positive because it could promote smoking cessation, prevent youth initiation, and mitigate unfair targeting of socioeconomically disadvantaged populations. Others perceived the ban was an overreach of government policy, financially motivated, and unfairly targeting the Black community that enjoyed menthol cigarettes. Many individuals who initially held a negative view of the ban developed a more positive opinion over the 6-months, largely due to individuals recognizing that the ban facilitated cessation.

Participants expressed the ban was rendered less effective in promoting cessation because of 1) unsanctioned selling of menthol cigarettes, 2) switching from menthol to non-menthol cigarettes, and 3) purchasing menthol cigarettes in nearby states where they were still sold legally. Many could not understand why only a menthol ban, and not a total cigarette ban, took effect. Increasing campaigns that educate individuals on the harms of all tobacco products are critical so that individuals do not misinterpret that non-menthol tobacco products are safe.

Several individuals acknowledged that a national menthol ban was needed to effectively promote smoking cessation, though some discussed how a national ban would not prevent companies from finding a way to add menthol additives to their products. Recent studies have shown that some tobacco companies market flavored tobacco accessories and filter modifications.(13, 20) Monitoring the industry for such activity will be critical to avoid further tobacco-related health disparities.

When implementing the menthol ban, individuals discussed the need of ensuring that tobacco treatment programs are accessible through increased advertising. D'Silva and colleagues showed that implementation of a nationwide menthol ban would require expansion of tobacco treatment programs to meet the needs of the increased number of individuals who would make a quit attempt.(21) Expanding funding for comprehensive tobacco prevention and control agencies may be necessary in conjunction with a national menthol ban.

There are strengths and limitations to our study. A strength is that it was conducted at a large safety-net hospital with a prevalence of menthol cigarette use, representing a demographic that was heavily affected by the Massachusetts menthol ban. Our small sample size from a single recruitment site limits generalizability. Our study is unique because it was a longitudinal study, though retention through the sixth month was just over 50%. Studies emphasize the importance of establishing participant-interviewer rapport from the first point of contact to maximize retention;(22) given the Covid-19 pandemic it was difficult to establish close relationships as interviews were conducted by telephone. Modeling of predictive reactions from the menthol ban suggests that the reaction period could last longer than 1 year; future studies should follow patients for at least this long.(15)

# Conclusion

Finalizing and implementing the FDA rule to ban menthol as a characterizing flavor in cigarettes and ban all characterizing flavors, including menthol in cigars, is a critical step to reducing tobacco-related health disparities and promoting health equity (1). Healthcare workers must capitalize on this moment to

promote tobacco treatment, and states must ensure that tobacco treatment programs are accessible to support individuals affected by the ban.

# Declarations

**Ethics Approval:** The Boston University Medical Campus Institutional Review Board approved the project. All procedures performed in studies involving human participants were in accordance with ethical standards of the Institutional Review Board. Informed consent was obtained from all individual participants included in the study.

**Consent for Publication:** Not applicable

**Availability of Data and Materials:** The data collected and analyzed during the current study are available from the corresponding author on reasonable request.

**Competing Interests:** HK serves as Section Editor for the Tobacco Dependence Treatment section for UpToDate and reports receiving royalties from UpToDate. All consultant positions are outside the submitted work. No other financial disclosures were reported by the authors of this paper.

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**Author's Contributions:**

Anna Booras conceived and designed the study, collected data, analyzed data, and drafted and revised the manuscript

Renda Soylemez Wiener contributed to the conception and design of the study and revised the manuscript

Jennifer Maccarone analyzed data and revised the manuscript

Andrew C. Stokes contributed to the conception and design of the study and revised the manuscript

Jessica L Fetterman contributed to the conception and design of the study and revised the manuscript

Naomi M. Hamburg contributed to the conception and design of the study and revised the manuscript

Johar Singh analyzed the data and revised the manuscript

Katia Bulekova analyzed the data and revised the manuscript

Hasmeena Kathuria conceived and designed the study, collected data, analyzed data, and drafted and revised the manuscript

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# Figures

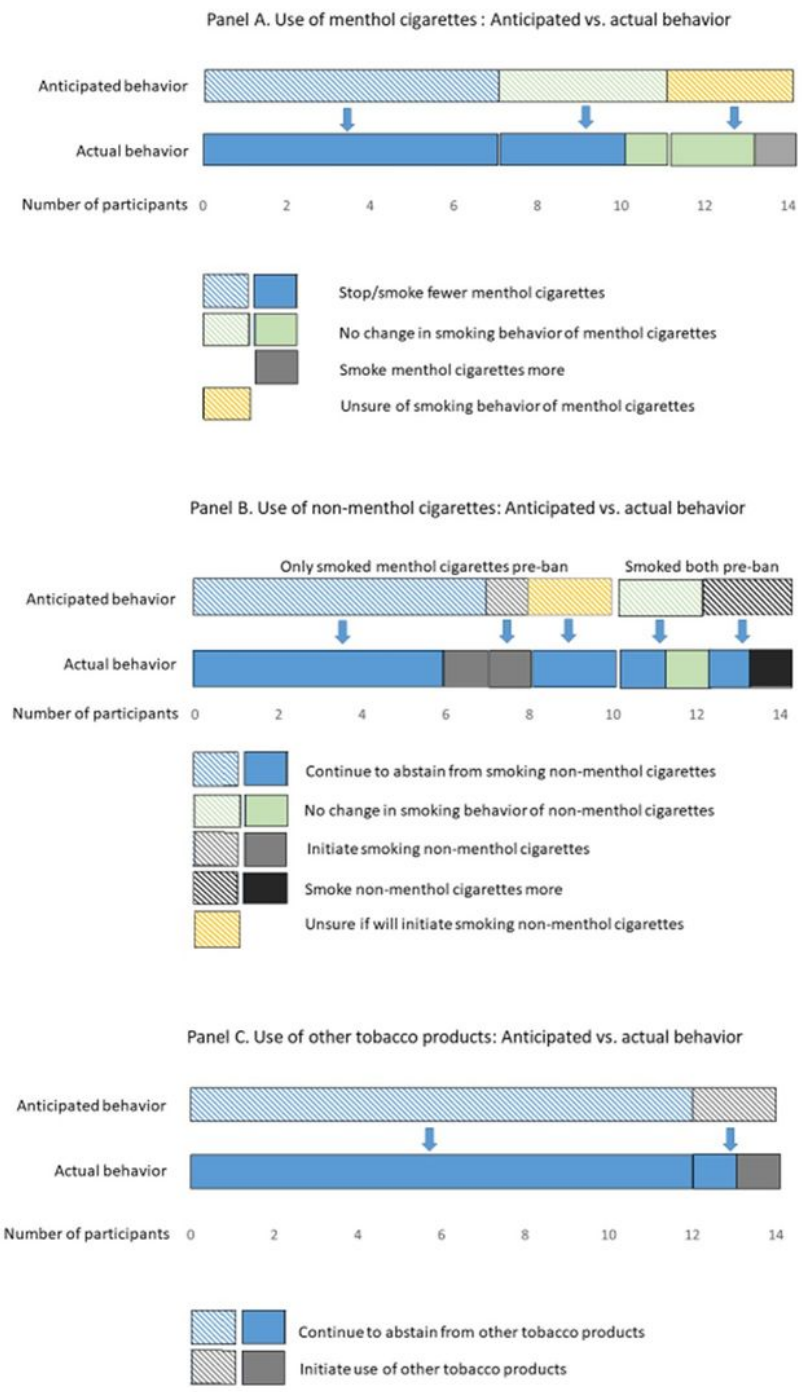


**Figure 1**

**Anticipated and actual behaviors at 6-months for purchasing and use of menthol cigarettes (Panel A), non-menthol cigarettes (Panel B), and other tobacco products (Panel C).**

# Supplementary Files

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