

# Use of Menthol Cigarettes and Accessories Among Youth Who Smoked After the Menthol Cigarette Ban in England and Canada, 2021: Implications for Health Equity

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## Abstract

**Introduction:** This study examined menthol cigarette use among youth who smoked, after menthol cigarette bans were implemented in England (May 2020) and Canada (October 2017).

**Aims and Methods:** Cross-sectional data come from 2021 ITC Youth Tobacco and Vaping Survey respondents aged 16–19 who smoked in the past 30 d in England ( $N = 715$ ) and Canada ( $N = 419$ ). Adjusted logistic regression models, estimated separately for each country, examined sociodemographic correlates of usually smoking menthol cigarettes (reporting currently most often smoking menthol cigarettes) overall, and by past 30-d use of any menthol accessories (e.g., filters, capsules). Youth reported the cigarette variety they smoked most often, coded as menthol or nonmenthol.

**Results:** Almost no youth who smoked in the past 30 d reported most often smoking a cigarette variety coded as menthol. However, 34.5% (95% CI: 30.4% to 38.9%) of youth who smoke in England and 30.9% (26.0%–36.3%) in Canada reported usually smoking menthol cigarettes, with greater odds of use among those identifying as black, or other race/ethnicity, respectively, compared to white in England (60.0%, aOR = 3.08,  $p = .001$ ; 47.4%, aOR = 2.27,  $p = .011$ ) and Canada (43.6%, aOR = 2.44,  $p = .046$ ; 51.2%, aOR = 2.92,  $p = .001$ ). Among those who reported usually smoking menthol cigarettes in England ( $N = 223$ ) and Canada ( $N = 108$ ), 71.7% (64.0%–78.2%) and 51.5% (41.1%–61.7%) reported using menthol accessories.

**Conclusions:** After menthol cigarette bans in England and Canada, approximately one-third of youth who smoked reported usually smoking menthol cigarettes, with disproportionately higher use among those identifying as black and other race/ethnicity. Menthol accessories accounted for most menthol cigarette use. Closing regulatory loopholes is critical to advancing public health equity.

**Implications:** Use of menthol cigarette accessories (eg, filters, cards, capsules) among youth who smoked was prevalent after implementation of menthol cigarette bans in England and Canada, and there was disproportionately higher use among those who identified as black and any other race/ethnicity. Efforts are therefore required to close regulatory loopholes of menthol cigarette bans. Findings further support countries, such as the United States, proposing menthol cigarette bans which extend coverage to accessories. More comprehensive menthol bans that also restrict accessories are likely to be more effective in reducing flavored tobacco use among young people and in advancing health equity.

## Introduction

Flavorings added to tobacco products pose a serious public health threat by increasing the appeal and palatability of smoking, which can facilitate initiation and sustain regular use.<sup>1–3</sup> Menthol, the most common cigarette flavor, has cooling and anesthetic properties that can further reduce the harshness of tobacco smoke on the throat, making inhalation easier.<sup>3</sup> As such, menthol cigarettes are particularly

attractive to youth.<sup>1,4,5</sup> The marketing of menthol cigarettes has historically been one of the tobacco industry's most prominent strategies for recruiting and retaining young people and for targeting specific subpopulations.<sup>3,6–8</sup> In the United States, populations most targeted by the tobacco industry use menthol cigarettes at higher rates than those not historically targeted, including youth and people who identify as female, LGBTQ+, and black.<sup>3,9</sup> In other countries, such as Canada and the United Kingdom, menthol cigarette

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use is also more common among young people and females; however, racial/ethnic disparities in menthol cigarette use have not been observed in these countries for youth<sup>10,11</sup> or adults.<sup>12,13</sup>

In accordance with the World Health Organization Framework Convention on Tobacco Control provision to prohibit or restrict flavors in tobacco products, an increasing number of countries have banned flavors, including menthol, in cigarettes.<sup>14,15</sup> Canada became the first country to implement a national ban on flavor additives, including menthol, in October 2017, with sub-national restrictions in some provinces prior to this.<sup>16</sup> In May 2020, the United Kingdom, alongside the European Union, banned menthol as a characterizing flavor in factory-made cigarettes and roll-your-own tobacco.<sup>17</sup> In contrast to Canada, in the United Kingdom and European Union, menthol and other flavor additives are still permitted in cigarettes, as long as they do not result in a clearly noticeable taste or smell before or during consumption.<sup>17</sup> Population-level studies in Canada,<sup>18–20</sup> England,<sup>11</sup> and the Netherlands,<sup>21</sup> have found evidence for menthol cigarette bans in reducing menthol cigarette use,<sup>11,21</sup> increasing quitting,<sup>18–21</sup> and preventing relapse<sup>19</sup> among those who smoke menthol cigarettes.

Previous studies (including the International Tobacco Control (ITC) Youth Tobacco and Vaping Survey), however, have also found that people who smoked continued to report use of menthol cigarettes after menthol cigarette bans.<sup>11,19,21,22</sup> One possible explanation for this trend is the use of menthol accessories (separate flavorings in the form of a card, capsule, filter, etc. that can be used to mentholate cigarettes), which are not explicitly banned in Canadian or UK/EU regulations.<sup>23,24</sup> Menthol accessories were introduced, or grew in popularity, in many postmenthol cigarette ban markets.<sup>23,24</sup> A second possible explanation for postban menthol cigarette use is illicit cigarettes or purchasing from less regulated sources such as the internet. While menthol cigarette bans have not been associated with increased illicit purchasing among adults who smoked,<sup>19,22,25,26</sup> less is known among youth.

Rationales used by tobacco regulating authorities in legislative texts or policy proposals for banning menthol cigarettes, including the April 2022 proposed ruling by the US Food and Drug Administration (FDA), have centered around protecting youth and advancing health equity.<sup>27</sup> Little is known, however, about the real-world impact of menthol bans on health equity among youth. One exception is a recent study using data from the ITC Youth Tobacco and Vaping Survey, which found that usual menthol cigarette use decreased among youth who smoked in England from before (9.4% in 2018) to after (3.0% in August 2020) the ban, with few differences observed across sociodemographic groups.<sup>11</sup> In Canada, menthol use remained stable across the postban period (3.1% in 2018 to 2.3% in August 2020).<sup>11</sup> The current study provides an update on youth use of menthol cigarettes in England and Canada, 1 and 4 years after menthol cigarette bans were implemented, respectively.

The aims of this study were (1) to assess prevalence and sociodemographic correlates of usual menthol cigarette use (overall and by use of menthol accessories) among youth who smoked in England and Canada, (2) to compare those who usually smoked menthol versus nonmenthol cigarettes on use of any illicit cigarettes and purchasing cigarettes from the internet in England and Canada, and (3) to examine how those who ever smoked menthol cigarettes perceived that their

smoking changed in response to the menthol cigarette ban in England.

## Materials and Methods

### Study Design

Cross-sectional data came from the England and Canada arms of the Wave 5 ITC Youth Tobacco and Vaping Survey, an online survey conducted from August 4 to September 5, 2021, among youth aged 16–19 years in England, Canada, and the United States. Respondents were sampled from Nielsen consumer panels. Among panelists who were sent invitations to participate, 3.7% in Canada and 7.9% in England completed the survey and were retained for analysis. Poststratification sample weights were constructed based on population estimates for sociodemographic variables; weights were rescaled to sample size within country. Additional details on the methodology can be found elsewhere.<sup>28</sup>

### Sample

This study was limited to youth aged 16–19 years in England ( $N = 4316$ ) and Canada ( $N = 4604$ ). The primary analytic sample for this study was further limited to those who smoked in the past 30 d in England ( $N = 715$ ) and Canada ( $N = 419$ ).

### Measures

For all measures, “don’t know” and “refused” to answer responses were set to missing.

### Menthol Cigarette Use

#### Type of Usual Cigarette Brand/Variety, Based on Coding

Respondents who reported smoking in the past 30 d were asked, “*What specific variety of cigarettes or roll-your-own tobacco do you currently smoke most often?*,” selected from a country-specific brand/variety list. Respondents also had the option to select “other variety” and enter their usual variety name. Brand varieties were coded independently by two authors (CNK & KAE; 93% agreement, with disagreements resolved through discussion) as follows: (1) menthol, (2) nonmenthol replacement, and (3) nonmenthol. “Nonmenthol replacement” varieties were those described as (1) having an explicit description as being part of the new “nonmenthol” cigarette range/ replacing a menthol brand on at least one online retailer website and/or (2) was on a list of “menthol alternatives” for two or more online retailers. The responses “don’t know,” “refused,” “I don’t have a usual variety” were set to missing data. [Supplementary Table 1](#) lists the reported brands coded as “menthol” and “nonmenthol replacement.”

#### Any Menthol Cigarette Smoking and Type, Based on Self-Report

Respondents who reported smoking in the past 30 d were asked, “*Is the variety of cigarettes or roll-your-own tobacco you currently smoke most often flavored to taste like menthol or mint?*,” “*In the past 30 d, were any of the cigarettes you smoked flavored to taste like menthol or mint?*,” and “*In the past 30 d, did any of the cigarettes you smoked have a filter that you squeeze or crush for flavor?*” (yes, no for each; separate questions for past 30-d use of menthol and capsule cigarettes combined as one measure given that factory-made capsule cigarettes came only in menthol flavor in England and Canada). Those who responded, “yes” to both currently

smoking menthol cigarettes most often and having smoked menthol/capsule cigarettes in the past 30 d were considered to have “usually smoked menthol cigarettes” and those who responded “no” to either/both were coded as “usually smoked non-menthol cigarettes.” Types of menthol cigarettes used were assessed with the question, “*In the past 30 d, which of the following types of menthol or mint cigarettes have you smoked? (select all that apply)*”: “regular” factory-made menthol cigarettes; menthol filters used with roll-your-own tobacco; menthol flavor cards (e.g., Rizla Menthol Chill) that are inserted into cigarette packets; liquid menthol drops used on cigarette filters (e.g., Instahit); menthol crush balls that are inserted into cigarette filters; and other (coded as yes, no for each type). Those who usually smoked menthol cigarettes and reported having used menthol filters, cards, drops, and/or crush balls in the past 30 d were considered to have “usually smoked menthol cigarettes with accessories” while those who did not report using any of these were considered to “usually smoke menthol cigarettes without accessories.”

### Ever Smoked Menthol Cigarettes

Respondents were considered to “ever smoke menthol cigarettes” if they were categorized as “usually smoking menthol cigarettes” and/or if they responded “yes” to the question “*Have you ever smoked a cigarette flavored to taste like menthol or mint?*”

### Menthol Ban Outcomes

#### Awareness of Menthol Cigarette Ban

Awareness (yes, no) was based on response to, “Some countries have banned menthol or mint cigarettes. Are menthol or mint cigarettes currently banned where you live?”

#### Perceived Impact of the Menthol Cigarette Ban on Smoking

In England only, those who ever smoked menthol cigarettes and who reported that menthol cigarettes were currently banned in the country where they live were asked, “*Has the ban on menthol or mint cigarettes changed your overall smoking?*” (yes, no). Those who responded “yes” were asked, “*How has the ban on menthol or mint cigarettes changed your overall smoking? (select all that apply)*: switched to non-menthol cigarettes because of the menthol ban; smoke less because of the menthol ban; smoke more because of the menthol ban; stopped smoking because of the menthol ban; the amount I smoke has not changed because of the menthol ban; other” (yes, no for each).

#### Illicit Cigarette Sources and Online Purchasing

In Canada, youth who smoked were asked, “*In the past 30 d, were any of the cigarettes you smoked from a First Nations Reserve, or cigarettes that you believe may have been smuggled or fake?*” (no; yes, cigarettes from a First Nations Reserve; yes, cigarettes that may have been smuggled or fake). The latter two responses were combined because most individuals in Canada who report accessing illicit cigarettes report accessing their cigarettes on First Nations Reserves.<sup>29</sup> In England, youth who smoked were asked, “*In the past 30 d, were any of the cigarettes you smoked from an untaxed source, or cigarettes that you believe may have been smuggled or fake?*” (yes, no). In both countries, respondents were also asked, “*In the past 30 d, how did you get the cigarettes that you smoked?*” with a list of options including “I bought them over the internet/

online” (yes, no). Respondents who usually smoked menthol cigarettes were additionally asked these same questions, but specifically for “any of the menthol or mint cigarettes that you smoked.”

### Covariates

For most respondents, sex (male, female) was determined by response to “sex at birth” (to align with categories used to calculate poststratification sample weights); if sex at birth was missing, sex was coded using responses to “gender”: male if “man” was selected, female if “woman” was selected. Age in years was categorized as 16–17 or 18–19. Perceived family income adequacy was used as a proxy for socioeconomic status, categorized as “not meeting basic expenses” or “just meeting basic expenses”; “meeting needs with a little left over”; or “living comfortably.” Race/ethnicity was based on respondents’ selection(s) from country-specific lists (could select multiple responses), categorized as “white only” (selected only response options coded as “white”), “black/black and another race or ethnicity” (selected any response options coded as “black” regardless of any other response options also selected), “indigenous” (in Canada only, selected response option coded as “indigenous,” except if already categorized), “any other race/ethnicity” (selected any other race/ethnicity response options, except if already categorized; see [Supplementary Table 2](#) for a full description). Race/ethnicity categorizations are consistent with a previous ITC Youth Tobacco and Vaping study.<sup>11</sup> Perceived addiction to cigarettes was assessed with the question, “*Do you consider yourself addicted to cigarettes?*” (not at all; yes, a little addicted; yes, very addicted).

### Statistical Analysis

Bivariate and multivariable analyses were conducted in Stata/SE 16.1 using weighted data. Use of different types of menthol cigarettes in England and Canada and perceived impact of the menthol ban on smoking behavior in England were examined overall and across race/ethnicity groups, reported as percentages with 95% confidence intervals (CIs). Three logistic regression models were estimated separately for England and Canada to examine sociodemographic correlates of (1) usual menthol cigarette use (any type), (2) usual menthol cigarette use with accessories, and (3) usual menthol cigarette use without accessories. Models were adjusted for sex, age, race/ethnicity, perceived family income adequacy, and perceived addiction to cigarettes, with results presented as adjusted odds ratios (aORs) with 95% CIs. Logistic regression models were also estimated in each country to examine correlates of (1) past 30-d use of any cigarettes from illicit sources and (2) purchasing any cigarettes from online, adjusted for the same covariates, as well as usual menthol cigarette type (nonmenthol, usual menthol with accessories, usual menthol without accessories). Covariates were identified conceptually based on the literature,<sup>11,30</sup> and selected for inclusion in the final model based on Akaike (AIC) and Bayesian information criteria (BIC).

## Results

### Sample Characteristics

In the overall sample, 14.9% (95% CI: 13.8 to 16.2) of youth in England and 8.1% (7.3%–8.9%) in Canada had smoked cigarettes in the past 30 d, with lower use among those

**Table 1.** Sample Characteristics of Youth Who Smoked in the Past 30 D in England and Canada at Wave 5 of the Itc Youth Tobacco and Vaping Survey, August–September 2021, Weighted

	England (N = 715)			Canada (N = 419)		
	N	%	95%CI	N	%	95%CI
Sex						
Male	251	53.5	(49.3, 57.6)	191	63.2	(58.4, 67.7)
Female	464	46.5	(42.4, 50.7)	228	36.8	(32.3, 41.6)
Age (years)						
16–17	211	36.1	(32.0, 40.3)	198	51.5	(46.3, 56.7)
18–19	504	63.9	(59.7, 68.0)	221	48.5	(43.3, 53.7)
Race/ethnicity						
White only	570	82.1	(78.7, 85.1)	252	61.2	(55.9, 66.3)
Black/black and another race or ethnicity	58	7.1	(5.3, 9.5)	35	8.3	(5.8, 11.7)
Any other race/ethnicity	81	10.8	(8.4, 13.7)	71	19.1	(15.1, 23.8)
Indigenous	—	—	—	50	11.4	(8.5, 15.0)
Perceived family income adequacy						
Not meeting/just meeting basic expenses	271	37.2	(33.1, 41.4)	140	30.9	(26.3, 35.9)
Meeting needs with a little left over	242	33.8	(29.8, 38.0)	137	36.0	(31.0, 41.3)
Living comfortably	179	29.1	(25.2, 33.3)	130	33.1	(28.3, 38.3)
Perceived addiction						
Not at all addicted	279	38.8	(34.7, 43.0)	161	38.6	(33.5, 43.8)
A little addicted	305	46.0	(41.7, 50.3)	161	40.3	(35.2, 45.6)
Very addicted	123	15.2	(12.5, 18.3)	85	21.1	(17.1, 25.8)
Usual cigarette brand/variety (based on brand coding) <sup>1</sup>						
Nonmenthol brand	470	83.9	(80.0, 87.1)	320	99.0	(95.8, 99.8)
Nonmenthol replacement brand	84	15.3	(12.1, 19.1)	0	0.0	—
Menthol brand	4	0.9	(0.3, 2.2)	2	1.0	(0.2, 4.2)
Usual cigarette type (based on self-report)						
Usually smoked nonmenthol cigarettes	462	65.5	(61.1, 69.6)	278	69.1	(63.7, 74.0)
Usually smoked menthol cigarettes (any type)	223	34.5	(30.4, 38.9)	108	30.9	(26.0, 36.3)
Usually smoked menthol cigarettes and reported past 30 d use of menthol accessories <sup>2</sup>	155	24.2	(20.5, 28.3)	54	15.6	(11.9, 20.1)
Usually smoked menthol cigarettes and did NOT report past 30-d use of menthol accessories	61	9.1	(6.8, 12.0)	50	13.5	(10.1, 17.8)
Menthol cigarette types (past 30-d use among those who usually smoked menthol cigarette, multiple responses allowed)						
“Regular” factory-made menthol cigarettes	117	18.4	(15.2, 22.3)	72	20.8	(16.5, 25.7)
Menthol filters with roll-your-own tobacco	106	16.5	(13.4, 20.2)	28	7.9	(5.3, 11.5)
Menthol flavor cards	49	7.7	(5.6, 10.5)	15	4.6	(2.7, 7.7)
Liquid menthol drops	32	5.4	(3.6, 7.9)	19	5.5	(3.4, 8.8)
Menthol crush balls	37	6.1	(4.2, 8.7)	13	3.7	(2.1, 6.5)
Other	1	0.7	(0.1, 0.4.6)	1	0.3	(0.0, 2.2)

<sup>1</sup>Don't know/refused/no usual brand was set to missing (England: N = 78; Canada: N = 43).

<sup>2</sup>Menthol filters with roll-your-own tobacco, menthol flavor cards, liquid menthol drops, and/or menthol crush balls

identifying as black (10.1%, aOR = 0.49,  $p < .001$ ) and any other race/ethnicity (8.4%, aOR = 0.40,  $p < .001$ ) compared to white (17.4%) in England. In Canada, there was no difference between those identifying as black compared to white (7.4% vs. 9.3%, aOR = 0.77,  $p = .235$ ), however use was lower among those identifying as any other race/ethnicity (4.7%, aOR = 0.50,  $p < .001$ ) and higher among Indigenous (21.6%, aOR = 2.63,  $p < .001$ ; [Supplementary Table 3](#)).

Characteristics of the analytic sample of youth who smoked in the past 30 d in England (N = 715) and Canada (N = 419) are presented in [Table 1](#).

### Menthol Cigarette Use, Based on Brand/Variety Coding

Based on the coding of usual cigarette variety reported, few youth who smoked were using a menthol variety (England: 0.9%, 0.3%–2.2%; Canada: 1.0%, 0.2%–4.2%). In England, 15.3% (12.1%–19.1%) reported a nonmenthol replacement brand. No reported brands were coded as a nonmenthol replacement in Canada ([Table 1](#)). [Supplementary Table 4](#) presents the proportion of brand types based on coding among subgroups of self-reported usual cigarette type.

## Prevalence of Menthol Cigarette Types, Based on Self-Report

Among youth who smoked, 34.5% (30.4%–38.9%) in England and 30.9% (26.0%–36.3%) in Canada reported usually smoking menthol cigarettes. Specifically, the proportion usually smoking menthol cigarettes and using menthol accessories in the past 30 d was 24.2% (20.5%–28.3%) in England and 15.6% (11.9%–20.1%) in Canada; usual menthol smoking and no past 30-d use of menthol accessories was 9.1% (6.8%–12.0%) in England and 13.5% (10.1%–17.8%) in Canada. The most common type of menthol accessories reported were menthol filters with roll-your-own tobacco (England: 16.5%, 13.4%–20.2%; Canada: 7.9%, 5.3%–11.5%). Other types of menthol accessories reported were menthol flavor cards (England: 7.7%, 5.6%–10.5%; Canada: 4.6%, 2.7%–7.7%), liquid menthol drops (England: 5.4%, 3.6%–7.9%; Canada: 5.5%, 3.4%–8.8%), and menthol crush balls (England: 6.1%, 4.2%–8.7%; Canada: 3.7%, 2.1%–6.5%). In addition, one-fifth of past 30-d youth who smoked reported using “regular” factory-made menthol cigarettes in England (18.4%, 15.2%–22.3%) and in Canada (20.8%, 16.5%–25.7%; [Table 1](#)).

Among the subgroup of youth who reported usually smoking menthol cigarettes in England ( $N = 223$ ) and Canada ( $N = 108$ ), 71.7% (64.0%–78.2%) and 51.5% (41.1%–61.7%) reported using menthol accessories in the past 30 d, respectively.

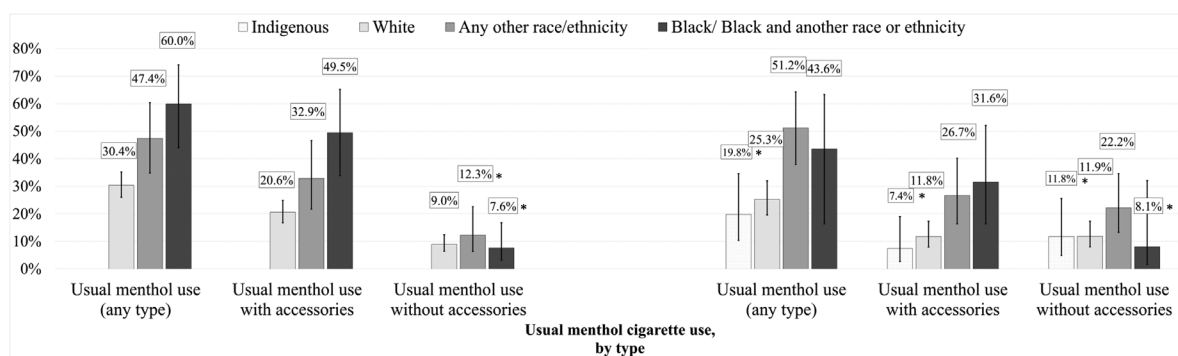
## By Sociodemographic Groups

As displayed in [Figures 1](#) and [2](#), among youth who smoked, the likelihood of reporting usually smoking menthol cigarettes was greater among those who identified as black and any other race/ethnicity, respectively, both in England (60.0%,  $aOR = 3.08$ ,  $p = .001$ ; 47.4%,  $aOR = 2.27$ ,  $p = .011$ ) and Canada (43.6%,  $aOR = 2.44$ ,  $p = .046$ ; 51.2%,  $aOR = 2.92$ ,  $p = .001$ ), compared to white (England: 30.4%; Canada: 25.3%; [Supplementary Table 5a](#)). The likelihood of usually smoking menthol cigarettes and past 30-d use of menthol accessories was also greater among those who identified as black and any other race/ethnicity, respectively,

both in England (49.5%,  $aOR = 3.90$ ,  $p < .001$ ; 32.9%,  $aOR = 2.23$ ,  $p = .023$ ) and Canada (31.6%,  $aOR = 4.18$ ,  $p = .006$ ; 26.7%,  $aOR = 3.02$ ,  $p = .005$ ), compared to white (England: 20.6%; Canada: 11.8%; [Supplementary Table 5b](#)). In contrast, the odds of usually smoking menthol cigarettes and not reporting past 30-d use of accessories did not differ across race/ethnicity groups in either country ([Supplementary Table 5c](#)). In Canada, youth who smoked and identified as indigenous did not differ from those who identified as white, for any of the menthol use outcomes. As noted in [Figure 1](#), some estimates had high sampling variability (relative standard error  $> 0.3$ ) due to the small subgroup sample sizes.

## Illicit Cigarette Sources and Online Purchasing

Reported use of any illicit cigarettes among those who usually smoked menthol cigarettes and did not report past 30-d use of accessories did not differ from those usually smoking nonmenthol cigarettes in England (12.8%, 6.6%–23.5%,  $aOR = 1.03$ ,  $p = .957$ ) or Canada (26.1%, 14.6%–42.3%,  $aOR = 1.25$ ,  $p = .695$ ). Those who reported usually smoking menthol cigarettes and past 30-d use of menthol accessories had greater odds of reporting that they smoked any cigarettes in the past 30 d that were from illicit sources, both in England (40.7%, 31.7%–50.3%,  $aOR = 4.65$ ,  $p < .001$ ) and Canada (60.2%, 45.7%–73.0%,  $aOR = 4.71$ ,  $p < .001$ ), compared to those usually smoking nonmenthol cigarettes (England: 11.3%, 8.1%–15.5%; Canada: 27.1%, 21.5%–33.6%). Similarly, those usually smoking menthol cigarettes and reporting past 30-d use of accessories had greater odds of reporting that any of the cigarettes they smoked in the past 30 d were purchased online in England (25.8%, 18.2%–35.2%,  $aOR = 12.03$ ,  $p < .001$ ) and Canada (30.3%, 19.0%–44.7%,  $aOR = 8.74$ ,  $p < .001$ ), compared to those using nonmenthol (England: 2.3%, 1.2%–4.4%; Canada: 3.1%, 1.4%–6.8%); no difference was found for those usually smoking menthol and not reporting past 30-d accessory use (England: 6.3%, 1.9%–19.0%,  $aOR = 2.65$ ,  $p = .212$ ; Canada: 4.5%, 1.1%–16.8%,  $aOR = 1.43$ ,  $p = .651$ ; [Table 2](#)). Limiting the analysis to use

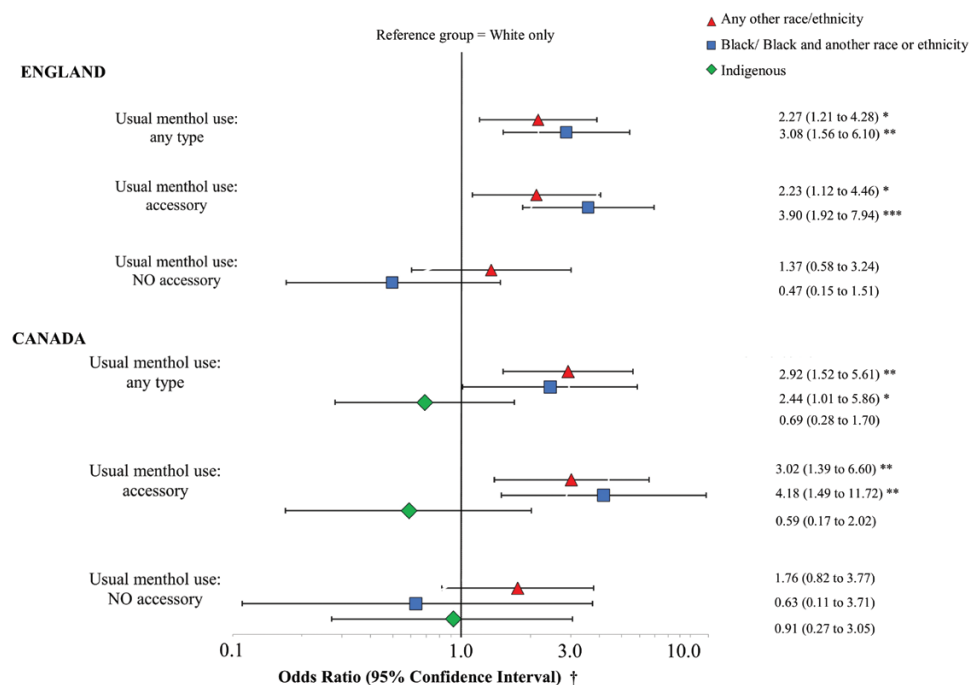


Menthol accessories= menthol filters with roll-your-own tobacco, menthol flavour cards, liquid menthol drops, and/or menthol crush balls

\*Indicates high sampling variability (HSV); relative standard error  $> 0.3$ ; interpret with caution

Sample sizes: England: White  $n=570$ , Black  $n=58$ , Other  $n=81$ ; Canada: White  $n=252$ , Black  $n=35$ , Other  $n=71$ , Indigenous  $n=50$

**Figure 1.** Prevalence of reported usual menthol cigarette use by past 30-d use of menthol accessories, across racial/ethnic groups among youth who smoked in the past 30 d in England ( $N = 715$ ) and Canada ( $N = 419$ ) at Wave 5 of the ITC Youth Tobacco and Vaping Survey, August–September 2021, weighted.



**Figure 2.** Adjusted odd ratios of menthol cigarette use types by race/ethnicity (relative to smokers self-identifying as white) among youth who smoked in the past 30 d in England and Canada at Wave 5 of the ITC Youth Tobacco and Vaping Survey, August–September 2021, weighted.

of illicit *menthol* cigarettes and online purchasing of *menthol* cigarettes showed similar results among those usually smoking menthol cigarettes (Supplementary Table 6).

### Awareness of the Menthol Cigarette Ban Among Subgroups

Among youth who smoked, 38.7% (34.6%–42.9%) in England and 26.1% (21.7%–31.0%) in Canada were aware that menthol or mint cigarettes were currently banned. This was higher than the overall sample of youth in England (18.6%, 17.3%–20.0%) and Canada (12.5%, 11.5%–13.6%), although this did not differ from awareness among those usually smoking menthol cigarettes and those who had ever smoked menthol cigarettes in either country (Supplementary Table 7).

### Perceived Impact of the Menthol Cigarette Ban on Smoking Behavior in England

Among those who ever smoked menthol cigarettes and who were aware of the ban in England ( $N = 335$ ), 71.3% (65.2%–76.7%) reported that their overall smoking did not change because of the ban, while 9.0% (6.0%–13.2%) reported that because of the menthol ban they switched to nonmenthol cigarettes, 15.6% (11.5%–20.7%) smoked less, 3.2% (1.5%–6.6%) smoked more, and 7.6% (4.8%–12.0%) stopped smoking (multiple responses could be selected). One-fifth (20.8%, 16.1%–26.5%) reported to have either smoked less or stopped smoking because of the menthol ban. Responses by race/ethnicity are presented in Supplementary Table 8, although subgroup sample sizes were small.

## Discussion

In 2021, after implementation of national menthol cigarette bans in England (May 2020) and Canada (October 2017), almost no youth aged 16–19 who smoked in the past 30 d

reported using a cigarette brand coded as menthol. However, in each country, approximately one-third of youth who smoked reported usually smoking menthol cigarettes; those identifying as black and any other race/ethnicity had greater odds of use compared to white respondents. Most menthol cigarette use reported was from use of menthol accessories, which are not explicitly covered by the regulations in either country. Cigarette brand coding also revealed that in England, many youth reported use of “nonmenthol replacement” brands. In both countries, reported use of any illicit cigarettes and cigarettes purchased online, respectively, did not differ between those usually smoking menthol cigarettes and not reporting past 30-d use of menthol accessories compared to those who usually smoked nonmenthol cigarettes. Lastly, we found that one-fifth of youth who ever used menthol cigarettes and who were aware of the menthol ban in England, reported that they stopped smoking or smoked less because of the menthol ban.

Our finding that substantial proportions of youth who smoked in England and Canada continued to report menthol cigarette use after menthol bans is consistent with previous studies documenting postban menthol cigarette use.<sup>11,19,21,22</sup> It has been speculated that postban menthol use is largely driven by use of legal menthol accessories (separate products in the form of cards, crush balls, drops, etc. that can be added to cigarettes to impart flavor); however, this is one of the first studies to confirm this hypothesis.<sup>23,25,31</sup> Menthol accessories entered the market and/or became more popular after implementation of menthol cigarette bans in Canada, as well as in the United Kingdom and European Union.<sup>23,24,32,33</sup> As noted by Chaiton et al. (2021), the tobacco industry did not actively promote these products in Canada after the menthol ban, in contrast with what has been observed in the United Kingdom and European Union where several tactics have been used to circumvent the menthol ban.<sup>23,24,31,32</sup> It is, therefore, unsurprising that menthol accessory use was higher in England

**Table 2.** Past 30 d Use of Any Illicit Cigarettes and Cigarettes Purchased From Online by Menthol Smoking Status, Among Youth Who Smoked in the Past 30 d in England and Canada at Wave 5 of the ITC Youth Tobacco and Vaping Survey, August–September 2021, Weighted

	England (N = 715)					Canada (N = 419)						
	N	%	95%CI	aOR <sup>†</sup>	95%CI	p	N	%	95%CI	aOR <sup>†</sup>	95%CI	p
Used any illicit cigarettes <sup>1,2</sup>												
Usually smoked <i>nonmenthol</i> cigarettes	43	11.3	(8.1, 15.5)	1.00	—	—	67	27.1	(21.5, 33.6)	1.00	—	—
Usually smoked <i>menthol</i> cigarettes and reported past 30-d use of <i>menthol accessories</i>	55	40.7	(31.7, 50.3)	4.64	(2.56, 8.41)	<0.001	33	60.2	(45.7, 73.0)	4.71	(2.22, 9.99)	<0.001
Usually smoked <i>menthol</i> cigarettes and did NOT report past 30d use of menthol accessories	10	12.8	(6.6, 23.5) <sup>*</sup>	1.03	(0.30, 3.54)	0.957	12	26.1	(14.6, 42.3)	1.25	(0.41, 3.85)	0.695
Used any cigarettes purchased online <sup>3</sup>												
Usually smoked <i>nonmenthol</i> cigarettes	11	2.3	(1.2, 4.4) <sup>*</sup>	1.00	—	—	7	3.1	(1.4, 6.8) <sup>*</sup>	1.00	—	—
Usually smoked <i>menthol</i> cigarettes and reported past 30-d use of <i>menthol accessories</i>	31	25.8	(18.2, 35.2)	12.03	(4.79, 30.19)	<0.001	17	30.3	(19.0, 44.7)	8.74	(2.68, 28.49)	<0.001
Usually smoked <i>menthol</i> cigarettes and did NOT report past 30-d use of menthol accessories	4	6.3	(1.9, 19.0) <sup>*</sup>	2.65	(0.57, 12.23)	0.212	2	4.5	(1.1, 16.8) <sup>*</sup>	1.43	(0.30, 6.91)	0.651

Menthol accessories = menthol filters with roll-your-own tobacco, menthol flavor cards, liquid menthol drops, and/or menthol crush balls.

<sup>†</sup>Logistic regression analyses adjusted for sex, age, race/ethnicity, perceived family financial situation, perceived addiction, and menthol smoker type (nonmenthol smoker, usual menthol smoker with menthol accessories, usual menthol smoker without menthol accessories)

<sup>\*</sup>Indicates high sampling variability; relative standard error > 0.3; interpret with caution

<sup>1</sup>Canada: “In the past 30 ds, were any of the cigarettes you smoked from a First Nations Reserve, or cigarettes that you believe may have been smuggled or fake? Smuggled cigarettes are cheaper cigarettes because not all taxes have been paid; these may include cigarettes that do not have a Government of Canada health warning message and/or do not have a tax stamp or may look like copies of real brands. We are NOT asking about duty-free cigarettes or other legal imports.” (no; yes, cigarettes from a First Nations Reserve; yes, cigarettes that may have been smuggled or fake). The latter two responses were combined because most individuals in Canada who report accessing illicit cigarettes report accessing their cigarettes on First Nations Reserves; N = 99 purchased from First Nations Reservations and N = 26 reported smoking cigarettes that may have been smuggled or fake.

<sup>2</sup>England: “In the past 30 d, were any of the cigarettes you smoked from an untaxed source, or cigarettes that you believe may have been smuggled or fake? Smuggled cigarettes are cheaper cigarettes because not all taxes have been paid; these may include cigarettes that do not have a UK health warning message and/or do not have a UK Duty Paid label or may look like copies of real brands. We are NOT asking about duty-free cigarettes or other legal imports.” (yes, no).

<sup>3</sup>In both countries: “In the past 30 d, how did you get the cigarettes that you smoked?” with a list of options including “I bought them over the internet/online” (yes, no).

than in Canada (24.2% vs. 15.6%). Our finding in Canada is consistent with a previous study in Ontario (Canada's most populous province) which found that during 2016–2019, 14.8% of those aged 16–29 years who smoked in the past 30 d reported using flavor accessories; this compares to 8.1% aged 30 or older.<sup>31</sup> Menthol accessory use has been associated with younger age in two studies in the Netherlands.<sup>23,25</sup> The high prevalence of menthol accessory use may partly explain why we found generally low awareness of the menthol cigarette ban among youth who smoked in both England (38.7%) and Canada (26.1%), with no difference in awareness between those using menthol and nonmenthol cigarettes. This finding further highlights how these products may undermine the impact of menthol bans.

In addition to the prevalent use of menthol accessories, our findings indicate that among youth who smoke, those identifying as black and any other race/ethnicity had significantly greater odds of use compared to those identifying as white. In the United States, menthol cigarettes are disproportionately used by people who smoke identifying as black/African American, a result of decades-long targeted tobacco industry marketing.<sup>3,30</sup> However, in England and Canada, racial/ethnic differences in menthol cigarette use have not been previously observed.<sup>11,13,34</sup> Given that we did not find racial/ethnic differences among those usually smoking menthol cigarettes and not reporting use of accessories nor in the sample of youth who smoked overall, these disparities appear to be specific to menthol accessories. This finding is consistent with and may help explain findings of a previous study using ITC Youth 2018–2020 data, which did not capture use of menthol accessories in the surveys. That study observed no racial/ethnic differences in England and Canada in usual menthol use based on brand coding, but similarly found greater odds of use in the same racial/ethnic groups for reported past 30-d use of menthol/capsule cigarettes.<sup>11</sup> Future research should examine where and how these products are marketed, including at the point-of-sale and via social media platforms, which may elucidate why racial/ethnic disparities in menthol accessory use have emerged in these countries. In Canada, we did not find differences in menthol use among youth who smoked identifying as indigenous as compared to white, which is notable given the substantial burden of smoking in this population, including among youth.<sup>35</sup>

Our finding that those reporting usual menthol cigarette use and not using accessories did not differ from nonmenthol users in using any cigarettes from illicit sources (nor purchasing cigarettes from online) aligns with growing evidence that menthol bans do not result in an observed increase in illicit trade, a common industry claim.<sup>19,22,25,26</sup> This is also strengthened by the fact that very few respondents reported smoking an actual menthol brand.

Youth who reported usually smoking menthol cigarettes and past 30-d use of accessories were also more likely to report smoking any cigarettes purchased online than those using nonmenthol cigarettes. This was true even in Canada where online cigarette sales are banned, highlighting a possible regulatory loophole specific to accessories. Accessibility of purchasing flavor accessories from online sources may further explain why reported use of menthol cigarettes did not differ by age (16–17 vs. 18–19), even though the federal minimum age for tobacco purchase is 18 in both England and Canada.

While most youth who reported usually smoking menthol cigarettes were using menthol accessories, some were not using

accessories, nor did they report an actual menthol brand. It is possible that these respondents misreported, or they failed to report their menthol brand because it did not appear on the prepopulated list (even though respondents could select “other” and fill in their brand/variety name if not listed). Similarly, they may have been using a menthol accessory not on the list of options. It is also plausible that respondents misreported based on also using other noncigarette products that are menthol flavored. For instance, one respondent reported “vapes” in the open-ended “other” option for type of menthol cigarettes used, indicating that there may have been some confusion with e-cigarettes.

Another possible explanation, specifically for England, is that some respondents may be perceiving their brand as being mentholated, given that the UK/EU menthol cigarette ban still permits menthol as an additive. Even though flavor additives are not permitted at levels that impart a characterizing flavor, tobacco industry exploitation of the regulatory challenges of this approach, which has been documented,<sup>24,36</sup> suggests that some products may not be in compliance. This has also been implicated through sensory and/or chemical testing of cigarette products on the UK and EU postban markets.<sup>36,37</sup> Even if products are compliant with the characterizing flavor ban, there is evidence that menthol can have cooling effects and facilitate inhalation even at levels below the threshold of a characterizing flavor.<sup>38,39</sup>

Moreover, the advertising of nonmenthol replacement brands/varieties, which 15% of youth who smoked in England were using, may create the impression of a menthol-like cigarette through brand descriptors such as “bright,” “green,” or “dual,” as well as promotional claims of offering “a distinctive blend” and “a fresh experience.”<sup>36</sup> In the United Kingdom, many online tobacco retailers have dedicated sections called “menthol alternatives” that point consumers directly to these cigarette products (see footnotes of [Supplementary Table 2](#)). Many of these brands/varieties are specifically designed to be used with menthol accessories and are often advertised as “do-it-yourself” menthol cigarettes. For example, some contain a recessed filter tip which allows consumers to add a separate filter tip and capsule accessories into the cigarette filter. The tobacco industry is responding in similar ways to the January 2023 menthol cigarette ban in California, USA, with the release of new nonmenthol replacement brands.<sup>40</sup> While some nonmenthol replacement brands, often sold with blue packaging and descriptors, were observed in Canada immediately after the menthol ban,<sup>41</sup> we did not find evidence that youth in our sample reported using these brands, perhaps reflective of Canada's more comprehensive regulatory approach prohibiting flavor additives at any level.

This study has limitations that should be considered. First, there may have been misclassification of both predictor and outcome variables. For instance, usual menthol use was classified based on respondents answering “yes” to both usually smoking menthol cigarettes and having smoked menthol cigarettes in the past 30 d. Thus, some respondents classified as usually smoking nonmenthol cigarettes may have concurrently used menthol cigarettes, but not as frequently. However, we conducted sensitivity analyses estimating past 30-d menthol use and usually smoking menthol cigarettes, separately, and found the same trends by race/ethnicity. Moreover, due to the small sample sizes and variations between countries in options, we combined several races/ethnicities into the category “any other race/ethnicity,”



which limited our ability to determine which specific “other” racial/ethnic groups may be driving the observed differences. As mentioned, the definition of smuggled cigarettes in the survey question and the fact that brands were selected from a prepopulated list may have resulted in misreporting. Another limitation is that this study is cross-sectional and does not account for behaviors prior to the menthol ban. Respondents’ perceived impact of the menthol ban on their smoking may have been particularly prone to recall or attribution error. This question was asked among those who reported ever smoking menthol cigarettes, a measure which does not account for how much or often the respondent had smoked menthol cigarettes. Given that some subgroup sample sizes were small and had high sampling variability, caution is warranted when interpreting some results.

This study found that menthol accessories, a loophole in the current menthol cigarette regulations, are popular among youth who smoked in England and Canada. In addition to attracting and sustaining menthol cigarette use among a primary target of these bans—youth—these products may be a threat to health equity, given disproportionate menthol cigarette use by race/ethnicity that was not previously observed in these countries. Findings support the US FDA’s proposed menthol cigarette ban to also cover “separate menthol flavorings,”<sup>27</sup> as well as some EU countries that have already restricted flavor accessories.<sup>23</sup> California’s menthol cigarette ban also prohibits menthol-flavored accessories, which are described in the legislation as “*tobacco product flavor enhancers*.” As evidenced by the proportion of youth who smoked in England who used nonmenthol replacement brands, impact of menthol bans may also be enhanced through complete bans on cigarette flavor additives (such as Canada), rather than just as characterizing flavors (such as the United Kingdom and European Union, and as proposed in the United States). Moreover, restricting online retail sources of tobacco products and accessories may help to reduce menthol cigarette prevalence, particularly among youth who are not of legal smoking age. Future research should monitor global use of flavor accessories for cigarettes and examine how these products are being marketed.

## Supplementary Material

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

## Ethics

This study was reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE#21847/31017) and the King’s College London Psychiatry, Nursing & Midwifery Research Ethics Subcommittee (PNM RESC).

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DH has provided Expert Witness testimony on behalf of governments and public health authorities in legal challenges initiated by tobacco and vaping companies. All other authors have no disclosures.

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## Data Availability Statement

Deidentified study data may be made available on request to researchers who submit a proposal that is approved by the principal investigator. Proposals should be submitted to David Hammond ([dhammond@uwaterloo.ca](mailto:dhammond@uwaterloo.ca)).

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