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Flavored Tobacco Product Use Among Young Adults by Race and Ethnicity: Evidence From the Population Assessment of Tobacco and Health Study

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Abstract

Purpose: Describe racial/ethnic patterns of flavored tobacco use to illuminate equity implications of flavored tobacco policies.

Methods: Using data on US young adults (ages 18–34; n = 8,114) in the Population Assessment of Tobacco and Health Study Wave 5 (2018–2019) and survey-weighted logistic regression, we estimated any flavors (regular brand) and mint/menthol (vs. other flavors) use by race/ethnicity among cigarette, e-cigarette, cigar, blunt, hookah, smokeless tobacco, and any tobacco product users.

Results: Any flavored tobacco use was common and was significantly higher for Black (75.1%; OR: 1.4; 95% CI: 1.2, 1.7) and Hispanic/Latinx (77.2%; OR: 1.4; 95% CI: 1.1, 1.7) users than White users (73.5%). The most pronounced difference across products was in menthol cigarette

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Disclaimer: The study design, analysis, and interpretation of the data are solely the responsibility of the authors and do not necessarily represent the official views of TRDRP or NIH.

Supplementary Data

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use between Black and White smokers (OR: 4.5; 95% CI: 3.5, 5.9). Among flavored product users, mint/menthol use was significantly higher for Latinx blunt and hookah users.

Discussion: Racial/ethnic disparities in flavored tobacco use include and extend beyond menthol cigarettes. Comprehensive flavored tobacco restrictions that include mint/menthol and non-cigarette products will likely have more equitable impact.

Keywords

Menthol cigarettes; Emerging adults; Vaping

On April 29, 2021, the US Food and Drug Administration announced a commitment to ban menthol as a characterizing flavor in cigarettes and to ban all characterizing flavors including menthol in cigars [1]. Congress had excluded menthol cigarettes from the 2009 Family Smoking Prevention and Tobacco Control Act, which banned other characterizing flavors in cigarettes, despite high menthol use among Black smokers [2] and historical racialized marketing of menthol cigarettes in Black communities [3–5]. In 2011, the FDA concluded that removing menthol cigarettes would benefit US public health but did not do so at the time [6,7]. The FDA's 2021 announcement follows over a decade of advocacy for equity in tobacco control, including a 2020 lawsuit in which the African American Tobacco Control Leadership Council (AATCLC), Action on Smoking and Health (ASH), American Medical Association (AMA), and National Medical Association (NMA) argued that by exempting menthol from the flavored cigarette ban, the FDA had failed to, and now must, implement policy that would promote the health of African Americans [8].

Flavored tobacco products such as menthol cigarettes are commonly used by young tobacco users [9,10]. Tobacco companies have long used flavors, including cooling flavors like menthol and sweet flavors like peach, to make their products appealing to young users [11,12]. The industry continues to introduce new flavored products, such as inexpensive disposable e-cigarettes. Flavors make tobacco products more appealing and socially acceptable to young people [13,14], can decrease harm perceptions [15,16], can increase initiation [17] and nicotine addiction [18], and can reduce cessation [2,19].

It is well established that menthol use is higher among Black young people who smoke cigarettes compared to their White peers [20]. However, less is known about racial/ethnic patterns of use of other flavored tobacco products. One study of adult tobacco users reported no significant differences in the use of flavored e-cigarettes and hookah by race/ethnicity [21], and another found no significant differences in flavored use of non-cigarette tobacco products among young adults [20]. In contrast, a study of adolescent cigar and cigarette smokers found that flavored use was higher among non-Hispanic White than Black and Hispanic/Latino/a/x (herein: Latinx) cigar and cigarette smokers [22]. These differences in findings across studies emphasize the need to compare the use of flavors across products using the same dataset and methods. It is particularly important to examine flavored tobacco use during young adulthood, a transitional time during which behaviors are solidified and other tobacco-related disparities (i.e., socioeconomic) emerge, and when potential negative consequences of flavored tobacco use might be averted [23].

In this study, we investigated racial/ethnic differences in flavored tobacco use among a nationally representative sample of young adult users of cigarettes, e-cigarettes, cigars, blunts, hookah, and smokeless tobacco to understand to what extent young people of color use flavored tobacco products. Among tobacco product users, we compared the prevalence of flavored (vs. non-flavored) tobacco use and menthol/mint flavors (vs. other flavors) by racial/ethnic group. Describing these patterns can illuminate the potential impact of policy that restricts access to flavored tobacco products, including FDA's action to eliminate menthol and flavored cigarettes and cigars, on young adults of different races and ethnicities.

Methods

This study examined racial/ethnic patterns of flavored tobacco product use among young adult tobacco users (age 18–34) with the fifth wave of the nationally-representative and longitudinal Population Assessment of Tobacco and Health (PATH) Study public use files [24,25].

The PATH Study questionnaire, completed via computer assisted interviews, assessed behaviors related to nine tobacco products. To yield suitably large sample sizes, we combined product-types into six categories: cigarettes, electronic nicotine products (herein: e-cigarettes), cigars (traditional cigars, cigarillos, and little cigars), blunts (the hollowed-out tobacco leaf wrapper of traditional cigar, cigarillo, or filtered cigar filled with marijuana), hookah (sometimes referred to by users as shisha), and smokeless tobacco (moist snuff, chewing tobacco, and snus). Interviews occurred December 2018–November 2019 and included both participants recruited at Wave 1 (2013–2014) and a replenishment sample recruited at Wave 4. Wave 1 recruitment over-sampled African Americans, young adults, and tobacco users. Our study included the 8,153 young adults who reported using at least one product in the past 30 days, had survey weights, and who had a value for the flavored tobacco measure of interest for at least one product they used. The following percentage of past 30-day product users were missing data on the outcome variable (i.e., flavored use): any tobacco: 1.5%; cigarettes: 2.7%; e-cigarettes: 3.2%; cigars: 12.2% (missing because exclusive blunt users were excluded and separately asked about flavored blunt use); blunts: 0.5%; hookah: 0.8%; and smokeless tobacco: 0.5%. This study was determined not to be human subjects research by the Institutional Review Board at the first author's university.

Study measures

Our study included individuals who had used a tobacco product at least once in the past 30 days (*past 30-day tobacco use*). Past 30-day use was not measured for blunt users, so we defined current blunt use as having used blunts in the past 12 months and currently using blunts every day or some days.

For past 30-day users of each product, the flavor of the respondent's regular brand was ascertained by asking: "Is [your regular brand] you use flavored to taste like menthol, mint, clove, spice, fruit, chocolate, alcoholic or non-alcoholic drinks, candy, desserts or other sweets?" (response options: yes, no, do not know). There were four product-specific variants of this question. First, cigarette smokers were only asked about menthol or mint cigarettes. Second, e-cigarette users were asked "What flavor is your regular brand? Choose all that

apply.” We classified endorsing at least one non-tobacco flavor as “flavored” use. There was no “I do not know” option. Third, for smokeless tobacco, “wintergreen, spearmint, and frost” was listed as another flavor option. Fourth, only blunt users who did not use cigars without cannabis were asked about flavored blunt use.

We aggregated the flavored product variable to create combined categories for cigars, blunts, smokeless tobacco, and any tobacco (all products combined). For users of a single product within the category (e.g., a cigarillo user who did not use filtered or traditional cigars), we applied the individual product’s flavor status to the combined category. For users of two or more products within the category, we combined products using the following strategy: we assigned “flavored use” if at least one of the individual products was flavored; assigned “non-flavored” if all products were used without flavor; and assigned “do not know” if no product was flavored but one or more was “do not know.”

Given menthol’s unique social meaning and status in tobacco control policy, we created a binary variable for whether or not flavored tobacco product users reported using mint/menthol flavor (a combined answer in the PATH questionnaire) for non-cigarette tobacco products. If a product user used both mint/menthol and other flavors, we coded them as a mint/menthol user. Respondents who did not use any flavored product were not assigned a value.

For supplemental analyses, we created an alternative measure that assessed any flavors used in the past 30 days (rather than the flavor of their regular brand). This measure was asked to all respondents who reported using the product in the past 30 days, whereas “regular brand” was asked only of respondents who also reported using one or more days in a follow-up question that asked the number of days used in the past 30. Because some respondents reported past 30-day use but then reported 0 days of use, our sample for regular brand is slightly smaller than for past 30-day use.

Sociodemographic variables

A combined variable measured race and ethnicity with four mutually exclusive groups: non-Hispanic/Latinx White (herein: White), non-Hispanic/Latinx Black or African American (herein: Black), Hispanic/Latino/a/x (herein: Latinx), and other race/multiracial non-Hispanic/Latinx (herein: other/multiracial). The PATH data combined individuals who reported their race to be American Indian and Alaska Native, Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, Other Asian, Native Hawaiian, Guamanian or Chamorro, Samoan, Other Pacific Islander, and multiracial in this fourth category. This race/ethnicity variable reflects social categories that, given the history of racialized marketing and systemic social inequities, we expected to be related to tobacco use and the use of flavors; it does not indicate distinct biological groups [26].

We also measured age group (18–24, 25–34), gender (female, male), and socioeconomic status (SES, reported as difficulty paying any bills in the past 30 days, which may better reflect socioeconomic resources than educational attainment or income for young adults) [27]. Younger age, female gender, and higher SES have been found to be associated

with flavored e-cigarette use among young adults in the PATH dataset [28] and are likely correlates of flavored tobacco product use.

Statistical analysis

For past 30-day users of each product, we calculated the prevalence of flavored, non-flavored, and “do not know” use of respondent’s regular brand for: (1) all young adults; and (2) for racial/ethnic sub-groups and used survey-weighted multinomial logistic regression to determine whether differences in the prevalence of flavored tobacco product use (vs. non-flavored use) across racial/ethnic groups were statistically significant, adjusting for age group, gender, and SES. Users of multiple products were included in the models for each product they used. We then calculated the prevalence of mint/menthol use among past 30-day users of flavored products and estimated the association between race/ethnicity and flavors use using unadjusted survey-weighted logistic regression.

Weights provided by the PATH study adjusted results to be representative of the non-institutionalized U.S. population in 2019. We weighted descriptive statistics using Wave 5 respondent-level sample weights and weighted statistical tests using Wave 5 respondent-level cross-sectional replicate weights using balanced repeated replication.

Among supplemental analyses, first, we estimated all models with a second measure of flavored tobacco use that indicated whether any flavored product was used in the past 30 days. While our primary measure of flavored tobacco use (regular brand flavor) reflects routine flavor preferences, use in the past 30 days might include other flavors used during experimentation or social use. We also re-estimated our models without adjusting for covariates to assess their sensitivity to model specification. All analyses were conducted using Stata 16.0.

Results

The weighted prevalence of any past 30-day tobacco use among young adults ($n = 18,284$) was 40.5%. The most prevalent products were cigarettes (23.3%), e-cigarettes (19.5%), and cigars (10.6%). Blunts (7.7%), hookah (4.5%), and smokeless tobacco (4.2%) were less commonly used.

Table 1 reports weighted demographic characteristics of all young adults and of past 30-day product users by product. Demographic makeup of users varied across products. White young adults (55.1% of full sample) comprised a larger percentage of past 30-day any tobacco, cigarette, e-cigarette, and smokeless users, and while Black young adults (13.7% of full sample) comprised 14.7% of any tobacco users, they comprised larger proportions of cigar, hookah, and blunt users. Latinx young adults (21.1% of full sample) and other/multiracial young adults (10.2% of full sample) comprised a larger proportion of hookah users than of overall tobacco users. Younger young adults (ages 18–24) comprised larger portions of e-cigarette, blunt, and hookah users than users of other products. For each product, the majority of users were male. Females comprised larger portions of hookah, blunt, and cigarette users than of cigar and smokeless users. Smokeless tobacco was

particularly popular among White (78.7%) and/or male (90.7%) young adults. Inability to pay bills was highest among blunt, cigar, and cigarette users.

Table 2 reports weighted prevalence of flavored product use by racial/ethnic group. The majority (74.5%) of tobacco users used flavored products. E-cigarettes (93.9%), smokeless (69.2%), hookah (59.5%), and blunts (54.8%) had the highest prevalence of flavored use. Table 3 reports adjusted relative risk between race/ethnicity and flavored product use (reference: non-flavored use). Black and Latinx smokers were significantly more likely to use flavored (i.e., menthol) cigarettes than White smokers, and Black young adult smokers had the highest prevalence of flavored use (69.7%; Black–Relative Risk Ratio (RRR): 4.5, 95% CI: 3.5, 5.9). Latinx e-cigarette (96.2%; RRR: 1.9, 95% CI: 1.2, 3.1) and cigar (49.1%; RRR: 1.5, 95% CI: 1.0, 2.0) users were significantly more likely to use flavored e-cigarettes and cigars than their White peers (93.0% and 37.8% respectively). Flavored blunt use (45.1%; RRR: 0.5, 95% CI: 0.3, 0.7) was significantly lower for Black users compared to White users (54.4%). Other associations were not statistically significant.

Black, Latinx, and other/multiracial young adult tobacco users were more likely to answer, “do not know” (vs. non-flavored) than White young adult tobacco users; “do not know” might measure multiple uncertainties about flavors and brands, making these results difficult to interpret.

Table 4 reports weighted prevalence and unadjusted odds of mint/menthol use by racial/ethnic group, compared to other flavors. Mint/menthol prevalence was highest for smokeless tobacco (93.1%), then hookah (45.1%), e-cigarettes (35.7%), cigars (20.8%), and blunts (11.1%). Latinx users of flavored cigars and hookah were significantly more likely to use mint/menthol than White users of these products. Other associations were not statistically significant.

Supplemental analysis

We examined the same factors using the outcome past 30-day flavored tobacco use rather than regular brand (Tables A1 and A2). Some statistical tests in this specification had different results; the associations between Black race/Latinx ethnicity and flavored tobacco use were not significant, nor were the associations between Latinx ethnicity and flavored e-cigarettes and cigars. In unadjusted models (Table A3), the results of all statistical tests are consistent with unadjusted models except that flavored e-cigarette use was statistically significantly higher for other/multiracial e-cigarette users (vs. White users) and “do not know” use was not significantly lower for Latinx blunt users in the unadjusted model.

Discussion

Our results reveal racial/ethnic patterns in flavored tobacco use across tobacco products and flavors. Consistent with previous findings, Black and Latinx young adult cigarette smokers were more likely to use menthol cigarettes, and we found Black and Latinx young adult tobacco users were significantly more likely to use any flavored tobacco product than White young adult users. For cigarettes, e-cigarettes, and cigars, the three most popular tobacco products, at least one non-White group used flavors at a higher proportion than

White users. The vast majority of young adults used flavored e-cigarette products, but Latinx and other/multiracial users used flavored e-products at even higher proportions than White users, and this difference was statistically significant for Latinx e-cigarette users. Given the negative consequences of flavored tobacco use, including increased tobacco appeal and nicotine addiction among young people, these disparities in use are concerning. Furthermore, these findings plausibly reflect a long history and continued targeted marketing of flavored tobacco products in communities of racial and ethnic minorities, contributing to disparities in marketing exposure and product use [29–31] and support educational and advocacy efforts that include engagement with the communities disproportionately targeted by the tobacco industry.

We also report that, among users of flavored products, mint/menthol flavor was significantly more popular among Latinx blunt and hookah users (vs. White users), and although other odds of mint/menthol use for Black, Latinx, and other/multiracial young adults (vs. White) in cigars, blunts, and hookah were not statistically significant, they were all greater than among White users. In contrast, the odds ratios for mint/menthol e-cigarette use were near or below one. The removal of non-mint/menthol flavored JUUL pods from the market in 2018 plausibly contributed to increased popularity of mint/menthol e-cigarettes among young adults of all racial/ethnic identities. Consistent with well-documented popularity of menthol cigarettes among Black and Latinx smokers, including in this paper, these results demonstrate greater use of mint/menthol flavors by non-White users of a range of combustible tobacco products.

We find some differences between models with regular brand and models with past 30-day use, which suggest these measures assess related but unique behaviors. We consider the regular brand measure a stronger measure of preference because it reflects commitment to flavored tobacco use, whereas past 30-day use might reflect social exchange and experimentation with flavored tobacco among generally non-flavored tobacco users, and we expect young adults who regularly use flavored products to be more impacted by flavored tobacco policy than those who use flavors occasionally. Given that two similar measures produce different statistical results, care should be given in defining and interpreting quantitative measures of flavored product use.

In recent years, city, county, and state governments have adopted policies banning the sale of some or all flavored tobacco products in their jurisdictions. A growing number of those policies include menthol cigarettes [32,33]. A recent study that examined who was covered by current local and state flavored tobacco policy found that the proportion of African American, Asian, and Latinx individuals living in a jurisdiction with any flavored tobacco restriction was similar to the proportion of White individuals covered by these policies, but that American Indian/Alaska Native and Native Hawaiian and Pacific Islander communities were underreached, and that African American and Latinx communities were additionally underreached by policies that included menthol cigarettes [32]. Equitable coverage for some racial/ethnic minority communities and inequitable coverage for others suggest that the current distribution of local and state flavored tobacco policies might yield mixed effects on racial/ethnic tobacco-related disparities.

Given flavored tobacco's popularity among young people of all racial/ethnic identities, it is likely that new federal restrictions on flavors will reduce overall tobacco use among young people [34,35]. As the plaintiffs in their lawsuit against FDA argued, if racial/ethnic minorities are more likely to smoke menthol cigarettes, a ban that excludes menthol might leave Black smokers underreached by the policy. One study of young adult smokers found that African American young adults were more likely to report that they would quit due to a menthol ban, but authors noted that the availability of other menthol products might hinder the effectiveness of a menthol cigarette ban [34]. Recognizing the potentially wide-reaching benefits of flavored tobacco regulation, collaboration between all concerned stakeholders might best advance tobacco control and related health equity. As local, state, and federal activities continue, attention to equitable implementation of new federal policies to end the sale of menthol and other flavored cigarettes and cigars is warranted. And because it could take years before the new FDA ban would go into effect, local and state efforts to enact comprehensive flavor bans can have more immediate effect.

The disparities we observe in flavored product use within products might be compounded by the popularity among young people of color of blunts and hookah, for which flavored use is more common than for cigarettes. Given the relatively high prevalence of cigar, blunt, and hookah use by young adults of color (flavored or not), policy that includes those products might also reach a larger number of young people of color, even though the prevalence of flavored use of those products among some racial/ethnic minority groups is similar to that of White young adult users. Flavored tobacco bans that exempt popular products such as hookah thus weaken policy impact. Our study suggests that eliminating exemptions for menthol and/or specific products from flavored tobacco policy is important to ensure equitable reach of tobacco control policy.

The tobacco industry has used policy exemptions, which it has lobbied for itself, to argue subsequently that banning flavors will not protect public health. For example, the state of California passed a nearly comprehensive law that banned the sale of flavored tobacco products. However, the tobacco industry and its front groups lobbied to exempt hookah [36], and then, upon its exemption, criticized the bill for its exemptions [37], for example, arguing that the policy's inclusion of menthol but exemption of hookah, cigars, and pipe tobacco gave "special treatment to the rich and [singled] out communities of color" [38]. While the popularity of menthol remains high, flavored tobacco use was not universal among young people of color. Flavored tobacco use was lower for Black blunt users and patterns were not consistent across racial/ethnic minority groups. Tobacco regulatory policy should be coupled with tailored efforts to prevent initiation and support cessation among racial/ethnic minority young adults [39,40], and embedded in a comprehensive, multi-disciplinary, multi-sector approach to achieve tobacco-related health equity [41].

Results of this study should be interpreted considering several limitations. First, current patterns might differ from our results because of evolution of the tobacco product marketplace, evolving formal and informal marketing on social media, and the implementation of tobacco control policy including a federal Tobacco 21 law (December 2019). Data for Wave 5 were collected during some of these changes and will reflect any changes in use that were already underway. Future longitudinal study is warranted to examine how racial and

ethnic disparities in flavored tobacco use have changed over time, including recently under evolving local, state, and federal policies and changing market dynamics. Furthermore, we cannot separate mint from menthol using the PATH study data, which is a limitation given the FDA's distinction between these flavors and differential patterns of use [42]. Lastly, our study of racial/ethnic patterns is limited by small sample size in some categories and limited to the categories offered by the dataset, masking within-group differences. Our approach is not able to explain the causes of patterns we observe. More disaggregated race/ethnicity data and other methodological approaches [43] can deepen our understanding of racial/ethnic patterns in flavored tobacco use and promote nuanced and inclusive tobacco control research and policy.

This nationally representative study found significantly greater flavored tobacco use by young adult tobacco users of color compared to their White peers across a range of tobacco products. Given the popularity of menthol cigarettes and other flavored tobacco products, it is likely that regulation and enforcement of flavored tobacco marketing at the point of sale and comprehensive policies to eliminate flavored tobacco that include menthol and non-cigarette products have potential to promote the health of young adults of color.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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IMPLICATIONS AND CONTRIBUTION

This paper reports current patterns of flavored tobacco use among young adults, a high-risk group, and describes existing racial/ethnic disparities in use prevalence. Racial/ethnic differences in flavored tobacco use prevalence exist for multiple products. Findings emphasize the need to apply a racial justice lens to tobacco control policymaking.

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Table 1
Weighted demographic characteristics of young adult past 30-day product users (2019^a)

	All young adults											
	w%	Any tobacco	Cigarettes	E-cigarettes	Cigars	Blunts	Hookah	Smokeless	w%	w%	w%	w%
Race												
White	55.1	58.5	61.2	62.6	47.7	48.8	27.8	78.7				
Black/African American	13.7	14.7	12.6	10.8	25.8	20.8	31.1	3.7				
Hispanic/Latino/a/x	21.1	18.6	18.0	17.5	19.0	21.7	27	9.4				
Multiracial/Other Race	10.2	8.1	8.2	9.2	7.5	8.7	14.1	8.2				
Gender												
Female	49.3	41.9	43.0	41.1	31.9	43.1	48.9	9.3				
Male	50.7	58.2	57.0	58.9	68.2	56.9	51.1	90.7				
Age												
18-24	41.2	41.9	32.0	55.6	41.7	52.4	46.6	38.0				
25-34	58.8	58.2	68.0	44.4	58.3	47.6	53.4	62.0				
Inability to pay bills	14.9	18.1	19.9	16.7	20.4	24.8	19.1	14.1				
N	18,284	8,153	4,353	4,258	1,973	1,740	939	754				

^aData source: PATH Study Wave 5 Public Use Files, collected December 2018–November 2019.

Weighted prevalence of flavored product use [regular brand] by race/ethnicity for young adult (18–34) past 30-day product users (2019)^a

Table 2

	Any tobacco			Cigarettes			E-cigarettes			Cigars			Blunts			Hookah			Smokeless		
	FL ^c	NF	DK	FL	NF	DK	FL	NF	DK	FL	NF	DK	FL	NF	DK	FL	NF	DK	FL	NK	DK
w% ^b	w%																				
All	74.5	21.1	4.5	45.7	49.4	4.9	93.9	6.1	0.0	41.1	44.4	14.5	54.8	33.8	11.4	59.5	17.2	23.4	69.2	20.6	10.2
White	73.5	23.3	3.2	39.2	57.4	3.4	93.0	7.0	0.0	37.8	46.6	15.6	54.4	30.7	14.9	52.8	20.0	27.3	70.5	21.1	8.4
Black/African American	75.1	18.0	6.9	69.7	23.8	6.5	92.2	7.8	0.0	40.4	45.5	14.1	45.1	48.9	6.0	60.5	17.8	21.7	68.2	16.7	15.2
Hispanic/Latino/a/x	77.2	17.6	5.3	53.4	39.8	6.9	96.2	3.8	0.0	49.1	40.2	10.7	62.0	28.8	9.3	64.1	14.2	21.7	57.3	21.6	21.2
Multiracial/Other race	74.4	18.6	7.0	39.5	50.7	9.8	97.0	3.0	0.0	45.0	38.2	16.9	63.0	27.7	9.3	61.5	16.3	22.2	70.7	16.7	12.6
N	8,153			4,353			4,258			1,973			1,740			939			754		

^aData source: PATH Study Wave 5 Public Use Files, collected December 2018–November 2019.

^bPercentages are weighted to represent the U.S. population in 2019.

^cWeighted percentage of past 30-day product users who reported their regular brand of the product to be flavored (FL), non-flavored (NF), and “do not know” (DK).

Relative risk of flavored product use [regular brand, ref: non-flavored] by race/ethnicity for young adult (18–34) past 30-day product users (2019)^a

Table 3

	Any tobacco	Cigarettes	E-cigarettes	Cigars	Blunts	Hookah	Smokeless
RRR^b [95%CI]							
FL							
Race							
White	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Black/African American	1.4 ^{95%} [1.2, 1.7]	4.5* [3.5, 5.9]	1.0 [0.5, 2.0]	1.0 [0.7, 1.3]	0.5* [0.3, 0.7]	1.1 [0.6, 2.0]	1.3 [0.5, 3.6]
Hispanic/Latino/a/x	1.4* [1.1, 1.7]	2.1* [1.6, 2.7]	1.9* [1.2, 3.1]	1.5* [1.0, 2.0]	1.2 [0.9, 1.6]	1.6 [0.9, 3.0]	0.8 [0.4, 1.6]
Multiracial/Other race	1.3 [1.0, 1.5]	1.1 [0.8, 1.5]	3.4 [1.6, 7.2]	1.1 [0.6, 2.0]	1.0 [0.7, 1.6]	1.3 [0.6, 2.8]	1.0 [0.5, 2.0]
Age group							
18–24	2.6* [2.3, 3.0]	1.0 [0.9, 1.2]	3.7* [2.5, 5.5]	1.1 [0.8, 1.4]	1.4* [1.1, 1.8]	0.6* [0.3, 0.9]	1.0 [0.7, 1.5]
25–34	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Gender							
Male	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Female	1.0 [0.8, 1.1]	1.6* [1.4, 1.9]	1.8 [1.2, 2.8]	1.9* [1.5, 2.4]	1.7* [1.3, 2.3]	1.7* [1.0, 2.7]	1.2 [0.5, 2.8]
Unable to pay bills	1.2 [1.0, 1.5]	1.2 [1.0, 1.4]	1.4 [0.8, 2.5]	1.2* [0.9, 1.6]	1.6* [1.2, 2.1]	0.7 [0.4, 1.3]	0.7 [0.3, 1.4]
Constant	2.2 [1.9, 2.5]	0.5 [0.4, 0.6]	5.8 [4.2, 8.0]	0.6 [0.5, 0.8]	1.1 [0.8, 1.5]	3.1 [1.8, 5.6]	3.5 [2.5, 5.1]
DK							
Race							
White	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Black/African American	3.3* [2.4, 4.7]	5.6* [3.1, 9.9]	–	1.0 [0.7, 1.4]	0.3* [0.1, 0.5]	0.9 [0.5, 1.7]	2.8 [0.5, 15.7]
Hispanic/Latino/a/x	2.2* [1.6, 3.1]	3.0* [1.9, 4.8]	–	0.8 [0.5, 1.2]	0.7* [0.4, 1.0]	1.1 [0.6, 1.9]	2.4 [0.9, 6.4]
Multiracial/Other race	3.0* [1.4, 6.2]	3.6* [1.6, 8.1]	–	1.3 [0.7, 2.7]	0.7 [0.3, 1.5]	0.7 [0.3, 1.6]	1.8 [0.6, 5.1]
Age group							
18–24	3.2* [2.2, 4.5]	2.7* [1.5, 4.8]	–	1.8* [1.3, 2.4]	1.6* [1.1, 2.5]	1.1 [0.7, 1.8]	2.5* [1.4, 4.5]
25–34	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Gender							
Male	ref.	ref.	ref.	ref.	ref.	ref.	ref.

	Any tobacco	Cigarettes	E-cigarettes	Cigars	Blunts	Hookah	Smokeless
	RRR^b [95%CI]						
Female	0.8 [0.6, 1.2]	1.1 [0.7, 1.5]	–	1.2 [0.8, 1.7]	1.2 [0.8, 1.9]	2.1* [1.2, 3.5]	3.0 [1.0, 9.6]
Unable to pay bills	0.6* [0.4, 1.0]	0.6* [0.4, 1.0]	–	1.1 [0.7, 1.8]	1.1 [0.7, 1.7]	0.7 [0.3, 2.5]	0.4 [0.1, 1.2]
Constant	0.1 [0.1, 0.1]	0.0 [0.0, 0.1]	–	0.2 [0.2, 0.3]	0.3 [0.2, 0.5]	1.0 [0.6, 1.7]	0.3 [0.1, 0.4]
N	8,114	4,325	4,243	1,958	1,733	935	750
F	20.0	22.2	9.2	5.3	5.7	2.2	2.4

For each product, survey-weighted multinomial logistic regression compared flavored use (FL) and do not know (DK) to non-flavored tobacco product use (reference category) for respondent's regular brand of the product. Models adjusted for age group, gender, and socioeconomic status.

^aData source: PATH Study Wave 5 Public Use Files, collected December 2018–November 2019.

^bAnalyses are weighted to represent the U.S. population in 2019; confidence intervals were estimated using Balanced Repeated Replication; RRR—relative risk ratio.

^c* *p* < .05.

Table 4
 Weighted prevalence and odds of mint/menthol product use [regular brand, ref: other flavors] by race/ethnicity for young adult (18–34) past 30-day flavored product users (2019^a)

	E-cigarettes		Cigars		Blunts		Hookah		Smokeless ^d	
	w% ^b	OR [95% CI]	w%	OR [95% CI]	w%	OR [95% CI]	w%	OR [95% CI]	w%	OR [95% CI]
All	35.7		20.8		11.1		45.1		93.1	
White	36.6	ref.	16.6	ref.	8.2	ref.	34.1	ref.	94.8	–
Black/African American	30.5	0.76 [0.6, 1.0]	24.3	1.6 [0.9, 3.0]	11.7	1.5 [0.7, 3.0]	39.5	1.3 [0.6, 2.6]	95.1	–
Hispanic/Latino/a/x	33.9	0.89 [0.7, 1.1]	23.3	1.5 [0.9, 2.7]	15.6	2.1 ^{ac} [1.2, 3.5]	54.8	2.3 [*] [1.1, 4.8]	93.0	–
Multiracial/Other race	38.8	1.1 [0.8, 1.5]	25.5	1.7 [0.6, 5.1]	13.6	1.8 [0.7, 4.6]	56.5	2.5 [1.0, 6.5]	76.2	–
Constant		0.58 [0.5, 0.6]		0.2 [0.1, 0.3]		0.1 [0.1, 0.14]		0.5 [0.3, 0.9]		
N	4,055		818		986		523		505	
F	1.61		1.22		2.63		3.17		–	

For each product, bivariate logistic regression compared mint/menthol product use versus use of other flavors for respondent’s regular brand of the product.

^aData source: PATH Study Wave 5 Public Use Files, collected December 2018–November 2019.

^bAnalyses are weighted to represent the U.S. population in 2019; confidence intervals were estimated using Balanced Repeated Replication.

^c * *p* .05.

^dResults not reported for smokeless tobacco due to small sample size.