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Prevalence and Reasons for Use of Flavored Cigars and ENDS among US Youth and Adults: Estimates from Wave 4 of the PATH Study, 2016–2017

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Abstract

Objectives: In this study, we present updated estimates of use prevalence, flavor use, and flavors as a reason for use among US cigar and electronic nicotine delivery system (ENDS) users.

Methods: Data come from Wave 4 of the Population Assessment of Tobacco and Health (PATH) Study and were collected between December 2016 and early January 2018. Results are presented for youth (12–17 years), young adults (18–24 years), and adults (25+ years).

Results: Approximately half (50.7%) of young adults reported having ever used an ENDS product with 83.7% reporting that their first ENDS product was flavored. Flavor use was particularly high among current (past 30-day) ENDS users at 97.0% among youth, 96.8% among young adults, and 81.2% among adults. For cigars, cigarillos were the most commonly used type among youth and young adults. Flavor use was highest among current cigarillo and filtered cigar users, with close to half of current users reporting flavor use across age groups.

Conclusions: Flavored product use is common among ENDS and cigar users.

Keywords

cigars; e-cigarettes; flavors; tobacco; vaping

Flavored tobacco use continues to be a significant public health concern in the United States (US), particularly among groups such as youth and racial minorities. Two of the products that are most used in flavored form, especially among young people, are electronic nicotine delivery systems (ENDS) and cigars. National Youth Tobacco Survey data from 2018 showed that 20.8% or 3.05 million high school students and 4.9% or 570,000 middle school students had used e-cigarettes in the past 30 days.¹ Among these youth, 2.37 million or 65.2% reported use of flavored e-cigarettes in the previous month.² For cigars, 7.6% or 1.1

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Human Subjects Approval Statement

The PATH Study was conducted by Westat, and Westat's Institutional Review Board approved its design and protocol. All respondents ages 18 years and older provided informed consent, with youth respondents ages 12 to 17 providing assent while a parent/legal guardian provided consent.

Conflict of Interest Disclosure Statement

The authors declare no potential conflicts of interest.

million high school students and 1.6% or 190,000 middle school students reported use in the past 30 days, and 570,000 or 43.6% of these users had used flavored cigars in the previous month. Cigar use prevalence was particularly high for certain groups, such as 9.2% for black high school students.

Because of these use patterns, we present updated estimates of ENDS and cigar type (filtered cigar, cigarillo, and traditional cigar) use prevalence as well as flavor use and flavors as a reason for use. We use PATH Wave 4 data, given that the PATH Study is particularly well suited to address these issues. PATH data have been used previously to analyze flavored product use, both cross-sectionally^{3–5} and longitudinally.^{6–8} Moreover, Wave 4 of the PATH Study included a probability replenishment sample, thereby allowing for updated nationally representative cross-sectional estimates of the US youth and adult population at the time of survey.

METHODS

This study estimated prevalence of ever and current cigar type and ENDS use as well as flavored cigar and ENDS use and flavors as a reason for use. It used PATH Wave 4 data collected from December 2016 to January 2018.⁹ (Given that data collection ended on January 3, 2018, we refer to the data as representing conditions through 2017). Wave 4 of the PATH Study employed a probability replenishment sample to account for loss of cohort members during follow-up. As such, the Wave 4 estimates for youth and adults presented here are nationally representative of the US civilian noninstitutionalized population ages 12 years and older at the time of the survey. Wave 4 questionnaires, along with additional study documentation and information on accessing the data, can be found at <https://doi.org/10.3886/Series606>.

ENDS devices were referred to as “electronic nicotine products” in the Wave 4 questionnaire. Ever cigar type or ENDS use was defined as having ever smoked or used these products, even one or 2 puffs or times. Current cigar type or ENDS use was defined as past 30-day use for youth aged 12–17 years and every day or some day use among established cigar type or ENDS users for young adults 18–24 years and adults 25 years and older. Established cigar type or ENDS use was identified by participants reporting having ever smoked or used that type of product fairly regularly. First product flavor use among ever cigar type users and flavor use among current cigar type users were assessed using the questions: “When you first started smoking [filtered cigars, cigarillos, or traditional cigars], were any of the [filtered cigars, cigarillos, or traditional cigars] that you smoked flavored to taste like menthol, mint, clove, spice, fruit, chocolate, alcoholic drinks, candy or other sweets?” and “In the past 30 days, were any of the [filtered cigars, cigarillos, or traditional cigars] that you smoked flavored to taste like menthol, mint, clove, spice, fruit, chocolate, alcoholic drinks, candy or other sweets?” Response options were “yes,” “no,” and “I don’t know.” First product flavor use among ever ENDS users and flavor use among current ENDS users were assessed with the questions: “When you first started using electronic nicotine products, which flavor did you use? Choose all that apply.” and “In the past 30 days, which flavors of [electronic nicotine products, electronic nicotine cartridges, or e-liquid] have you used? Choose all that apply.” Response options were tobacco-flavored,

menthol/mint, clove/spice, fruit, chocolate, alcoholic drinks, non-alcoholic drinks, candy/desserts/other sweets, or some other flavor. Users were categorized as “non-flavored” ENDS users if they reported tobacco-flavored only or did not select any of the flavors in the list and “flavored” users if they reported use of any of the listed flavors. Survey participants were asked if their first cigar or ENDS product was flavored in the first wave in which they reported ever having used a cigar type or ENDS product, and their responses were collected from data from Waves 1 to 4. Participants reporting product use were also asked a series of yes-no questions about whether various factors were a reason for their use. We calculated the proportion of current cigar type or ENDS users who endorsed “[Filtered cigars, cigarillos, traditional cigars, or e-liquid] come[s] in flavors I like” as a reason for use.

Analyses were conducted in SAS (SAS Institute, version 9.4) using Wave 4 cross-sectional survey weights with balanced repeated replication and Fay’s adjustment of 0.3. Proportions were calculated using Wilson’s method, and estimates were flagged if the sample size of the denominator was less than 50 or the relative standard error or its complement was greater than 30%.

RESULTS

Table 1 presents estimates of ever cigar and ENDS use prevalence and the proportion of ever users who reported that their first product was flavored. By age group, 15.3% of youth, 50.7% of young adults, and 24.2% of adults reported having ever used ENDS products. For cigars, 36.8% of young adults and 31.8% of adults reported having ever used cigarillos and 23.8% of young adults and 32.6% of adults reported having ever used traditional cigars. Over 90% of youth ENDS users and 80% of young adult ENDS users reported that their first ENDS product was flavored compared to approximately 55% of adults. Around 65% of youth and young adult cigarillo users and 55% of youth and young adult filtered cigar users reported that their first cigar product was flavored compared to approximately 40% of adult users of these cigar types.

Table 2 shows current use prevalence, flavor use, and flavors as a reason for use by product type and age group. ENDS use again tended to be somewhat higher than cigar type use, with 4.3% of youth, 6.6% of young adults, and 2.8% of adults reporting current use. Flavored product use was extremely common among current ENDS users, with 97.0% of youth, 96.8% of young adults, and 81.2% of adults reporting that they used flavored products. For current cigar users, cigarillos were the most commonly used product type among youth and young adults at 0.9% and 2.6%, respectively. Flavored cigar use was most common among cigarillo and filtered cigar users at around 50% across age groups.

Most current ENDS users reported that flavors were a reason for use, from 71.0% to 89.6% by age group. Among cigar users, cigarillo users most commonly endorsed flavors as a reason for use, from 60.0% to 72.9%. Filtered cigar and traditional cigar users reported flavors as a reason for use at similar levels that were generally consistent across age groups, from 53.8% to 66.7% for filtered cigar users and 52.7% to 57.5% for traditional cigar users.

DISCUSSION

These data consistently show that flavors continue to be an important factor in ENDS and cigar use across age groups and product types. Around 15% of youth and approximately 50% of young adults reported that they had ever used ENDS products. Around 97% of current youth and young adult ENDS users reported that they had used flavored products in the past 30 days, and almost 90% of young adult users reported that flavors were a reason for use. Among cigar users, 45% to 55% of current cigarillo and filtered cigar users reported that they used flavored cigars. Across all cigar types, over 50% to almost 75% of users reported that flavors were a reason for use.

These and other estimates¹ demonstrate that ENDS use is a serious public health concern, especially among young people. For example, a previous analysis of Wave 1 PATH data found that 3.1% (95% Confidence Interval (CI) = 2.8%, 3.5%) of youth and 3.8% (95% CI = 3.4%, 4.3%) of young adults were current ENDS users.³ By Wave 4, these figures had increased to 4.3% (95% CI = 3.9%, 4.8%) and 6.6% (95% CI = 6.2%, 7.2%). At the same time, flavor use among current ENDS users increased from 85.3% (95% CI = 80.7%, 89.0%) among youth and 83.4% (95% CI = 79.2%, 86.9%) among young adults at Wave 1¹ to 97.0% (95% CI = 94.9%, 98.2%) and 96.8% (95% CI = 94.4%, 98.2%) at Wave 4.

Some Wave 4 estimates of flavored cigar use may differ from PATH estimates from previous waves. Among PATH Wave 1 young adults, 68.0% of cigarillo users and 79.3% of filtered cigar users reported using flavored cigars.³ Such differences may reflect growing numbers of cigar users responding “I don’t know” to the flavored use question. These responses were excluded from the Wave 1 estimates but were retained as a separate category here. Among Wave 4 youth, 22.2% of traditional cigar, 16.5% of cigarillo, and 18.9% of filtered cigar users reported “I don’t know” regarding flavor use. These responses could reflect the growing use of non-specific concept descriptors such as “Tropical” for flavored cigars. Sales data indicate that the market share of such concept-named cigars increased from 9% to 15% of the cigar market in the US from 2012 to 2016, which could have resulted in part from policies restricting flavored cigars.¹⁰ For example, a 2019 study found a 74% increase in sales of concept-named cigars in Providence, Rhode Island following a ban on flavored cigars in that city.¹¹

This study is subject to certain limitations. Data were collected primarily in 2017 and may not reflect current use patterns, especially for products such as ENDS that have experienced increases in youth use in recent years. Estimates from the PATH Study, which has a household-based sample design, may differ from those obtained from school-based surveys such as the National Youth Tobacco Survey. This analysis also has focused on cigars and ENDS products because of their use patterns among young people, but flavors continue to be a public health concern among other tobacco products as well.

The Food and Drug Administration continues to take steps to address the public health issues raised by flavored tobacco use. The agency announced plans in September 2019 to stop exercising enforcement discretion with new flavored deemed tobacco products, including ENDS.¹²

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Table 1

Ever Cigar and ENDS Use Prevalence and First Product Flavored by Product Type and Age Group (%), PATH Study Wave 4, 2016–2017

	Youth (12–17 years)			Young Adults (18–24 years)			Adults (25+ years)		
	N	Ever Use Prevalence ^a	Proportion of Ever Users Who Reported First Product Was Flavored ^b	N	Ever Use Prevalence	Proportion of Ever Users Who Reported First Product Was Flavored	N	Ever Use Prevalence	Proportion of Ever Users Who Reported First Product Was Flavored
Filtered cigars	198	1.4 (1.2, 1.6)	55.8 (46.2, 65.0)	2133	18.9 (17.7, 20.2)	53.6 (50.3, 56.8)	5785	16.9 (16.2, 17.5)	39.9 (38.3, 41.6)
Cigarillos	559	3.8 (3.5, 4.2)	68.5 (62.6, 73.8)	4171	36.8 (35.2, 38.4)	63.4 (61.3, 65.4)	10218	31.8 (30.7, 32.8)	42.4 (40.8, 43.7)
Traditional cigars	232	1.7 (1.5, 1.9)	38.9 (31.8, 46.4)	2535	23.8 (22.5, 25.1)	35.5 (33.2, 37.8)	9159	32.6 (31.5, 33.7)	21.6 (20.3, 23.0)
ENDS	2221	15.3 (14.6, 16.0)	93.2 (91.9, 94.3)	5854	50.7 (49.0, 52.4)	83.7 (82.5, 84.8)	10115	24.2 (23.5, 24.9)	54.9 (53.3, 56.5)

Note.

Abbreviation: ENDS - Electronic nicotine delivery system, PATH - Population Assessment of Tobacco and Health.

^a: Ever users reported having ever smoked or used a cigar type or ENDS product, even one or 2 puffs or times.

^b: Flavored product use among ever cigar smokers was assessed with the question “When you first started smoking [filtered cigars, cigarillos, or traditional cigars], were any of the [filtered cigars, cigarillos, or traditional cigars] that you smoked flavored to taste like menthol, mint, clove, spice, fruit, chocolate, alcoholic drinks, candy or other sweets?” Response options were “yes,” “no,” and “I don’t know.” Flavor use among ever ENDS users was assessed with the question “When you first started using electronic nicotine products, which flavor did you use? Choose all that apply.” Response options were tobacco-flavored, menthol/mint, clove/spice, fruit, chocolate, alcoholic drinks, non-alcoholic drinks, candy/desserts/other sweets, or some other flavor. Users were categorized as “non-flavored” ENDS users if they reported tobacco-flavored only or did not select any of the flavors in the list and “flavored” users if they reported use of any of the listed flavors.

Current Cigar and ENDS Use Prevalence, Flavor Use, and Flavors as a Reason for Use by Product Type and Age Group (%), PATH Study Wave 4, 2016–2017

	Youth (12–17 years)			Young Adults (18–24 years)			Adults (25+ years)		
	N	Current Use Prevalence (Past 30-day Use)	Proportion of Current Users Who Report Flavored Product Use ^a	N	Current Use Prevalence (Every Day or Some Day Established Use) ^b	Proportion of Current Users Who Report Flavored Product Use ^c	N	Current Use (Every Day or Some Day Established Use)	Proportion of Current Users Who Report Flavored Product Use
Filtered cigars	43	0.3 (0.2, 0.4)	45.0 (31.2, 59.7)*	98	0.7 (0.6, 0.9)	47.8 (33.5, 62.5)	380	0.8 (0.7, 1.0)	49.3 (43.0, 55.5)
Cigarillos	143	0.9 (0.8, 1.1)	47.4 (38.7, 56.3)	340	2.6 (2.3, 2.9)	51.4 (44.7, 58.2)	643	1.3 (1.2, 1.5)	53.4 (48.0, 58.8)
Traditional cigars	47	0.3 (0.2, 0.5)	27.2 (16.6, 41.3)*	103	0.9 (0.7, 1.2)	35.7 (23.2, 50.4)	495	1.3 (1.1, 1.4)	23.7 (18.6, 29.7)
ENDS	598	4.3 (3.9, 4.8)	97.0 (94.9, 98.2)	768	6.6 (6.2, 7.2)	96.8 (94.4, 98.2)	1220	2.8 (2.6, 3.0)	81.2 (77.6, 84.3)
Proportion of Current Users who Endorsed “Come in flavors I like” as a Reason for Use									
Filtered cigars		53.8 (39.0, 67.9)*			54.7 (41.1, 67.7)			66.7 (61.2, 71.8)	
Cigarillos		60.0 (50.6, 68.7)			70.7 (65.0, 75.9)			72.9 (68.0, 77.3)	
Traditional cigars		52.7 (38.6, 66.4)*			57.5 (46.1, 68.3)			53.8 (47.3, 60.1)	
ENDS		71.0 (67.1, 74.6)			89.6 (87.1, 91.6)			81.9 (79.2, 84.3)	

Note.

Abbreviation: ENDS - Electronic nicotine delivery system. PATH - Population Assessment of Tobacco and Health.

^a: Flavored product use among current cigar smokers was assessed with the question “In the past 30 days, were any of the [filtered cigars, cigarillos, or traditional cigars] that you smoked flavored to taste like menthol, mint, clove, spice, fruit, chocolate, alcoholic drinks, candy or other sweets?” Response options were “yes,” “no,” and “I don’t know.” Flavor use among current ENDS users was assessed with the question “In the past 30 days, which flavors of [electronic nicotine products, electronic nicotine cartridges, or e-liquid] have you used? Choose all that apply.” Response options were tobacco-flavored, menthol/mint, clove/spice, fruit, chocolate, alcoholic drinks, non-alcoholic drinks, candy/desserts/other sweets, or some other flavor. Users were categorized as “non-flavored” ENDS users if they reported tobacco-flavored only or did not select any of the flavors in the list and “flavored” users if they reported use of any of the other listed flavors during the past 30 days.

^b: Established users reported having ever smoked or used a cigar type or ENDS product fairly regularly.

^c: Current flavored product use among adults was asked of current every day or some day established users who had smoked or used a product on at least one day in the past 30 days.

* Estimate should be interpreted with caution because it has low statistical precision. It is based on a denominator sample size of less than 50, or the coefficient of variation of the estimate or its complement is larger than 30%.