HHS Public Access

Author manuscript

JAMA. Author manuscript; available in PMC 2019 April 16.

Published in final edited form as:

JAMA. 2015 November 03; 314(17): 1871–1873. doi:10.1001/jama.2015.13802.

Flavored Tobacco Product Use Among US Youth Aged 12–17 Years, 2013–2014

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Most tobacco use begins during youth and young adulthood.[1] Recent declines in prevalence of cigarette smoking among youth have coincided with increased use of e-cigarettes and hookahs.[2] Although flavors other than menthol are prohibited in cigarettes in the United States,[3] flavored non-cigarette tobacco products are widely available and may appeal to youth.We examined flavored tobacco use among a nationally representative sample of US youth.

Methods |

The Population Assessment of Tobacco and Health (PATH) Study is a household-based, nationally representative, longitudinal cohort study of 45 971 adults and youth (12–17 years) in the United States. We analyzed youth data from wave 1, collected September 2013 through December 2014 (the survey is available in the eAppendix in the Supplement). Among youth within participating households (weighted household screener rate, 54%), 78.4% participated in an audio computer-assisted interview. Nonresponse analysis showed

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Author Contributions: Drs Ambrose and Day had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy ofthe data analysis.

Additional Contributions: We thank David Maklan, PhD, and Charles Carusi, PhD, from Westat Incfor contributions to study design and supervision, as well as data acquisition. We also thank Kristie Taylor, PhD, from Westat Incfor contributions to the study design and analytic support. Drs Maklan, Carusi, and Taylor received compensation for their contributions to the PATH Study.

Study concept and design: Ambrose, Conway, Borek, Hyland, Villanti.
Acquisition, analysis, or interpretation of data: All authors.
Drafting of the manuscript: Ambrose.
Critical revision of the manuscript for important intellectual content: All authors.
Statistical analysis: Day, Rostron.
Administrative, technical or material support: Ambrose, Borek, Villanti.
Study supervision: Conway, Borek, Hyland.

few differences with referent national surveys.[4] Survey weights were adjusted for nonresponse.

Parents and emancipated youth provided written informed consent, whereas youth assented to participate. Further details regarding the study methods are available.[4] The study was conducted by Westat and approved by the Westat institutional review board.

Youth responded to questions about ever and past 30-day use of tobacco products including cigarettes, e-cigarettes, hookahs, cigars (traditional cigars, cigarillos, filtered cigars), pipe tobacco, all types of smokeless tobacco, dissolvable tobacco, bidis, and kreteks. For each product ever used, youth endorsed whether the first product they used was flavored (eg, "Was the first e-cigarette you used flavored to taste like menthol, mint, clove, spice, candy, fruit, chocolate, alcohol [such as wine or cognac], or other sweets?"). Users of noncigarette products reported any past 30-day use of a flavored product. Past 30-day noncigarette tobacco users also reported reasons for product use, including "(It) comes in flavors I like," for each product. Past 30-day cigarette smokers reported smoking cigarettes flavored to taste like menthol or mint.

We used SAS version 9.3 (SAS Institute Inc) survey procedures to account for weighting and calculated proportions with 95% confidence intervals for all measures. Estimates from denominators of fewer than 50 users are suppressed; estimates with relative standard errors greater than 30% are flagged.

Results |

Of the 13 651 youth enrolled and included in this analysis, 51.3% were male, 54.5% non-Hispanic white, 13.7% non-Hispanic black, and 22.5% Hispanic. Mean respondent age was 14.5 (SD, 0.02) years. Table 1 summarizes ever and past 30-day use of flavored tobacco products. The majority of youth ever-users reported that the first product they had used was flavored, including 88.7% of ever hookah users, 81.0% of ever e-cigarette users, 65.4% of ever users of any cigar type, and 50.1% of ever cigarette smokers. For past 30-day youth tobacco use, the overall proportion of flavored product use was 79.8% (95% CI, 77.3% −82.3%) among users of any product and 89.0% among hookah users, 85.3% among e-cigarette users, 71.7% among users of any cigar type, and 59.5% among cigarette smokers.

Table 2 presents leading reasons for use among past 30-day noncigarette tobacco users. Youth consistently reported product flavoring as a reason for use across all product types, including e-cigarettes (81.5%), hookahs (78.9%), cigars (73.8%), smokeless tobacco (69.3%), and snus pouches (67.2%).

Discussion |

Among a survey of youth aged 12 to 17 years, the majority who self-reported ever experimenting with tobacco started with a flavored product, and most current youth tobacco users reported use of flavored products. This study extends a recent national report[5] on youth use of flavored tobacco products by examining first use of flavored product among ever users by products and flavorings as a reason for noncigarette tobacco use. Consistent with

national school-based estimates,[5] this study confirms widespread appeal of flavored products among youth tobacco users. In addition to continued proven tobacco control and prevention strategies, efforts to decrease use of flavored tobacco products among youth should be considered.[1]

Study limitations include potential difficulty with recall because youth often experiment with many products. This cross-sectional analysis does not allow direct estimation of flavoring's role in initiation of tobacco use among youth. In addition, there are mode differences in household- vs school-based youth tobacco surveys.[6] Data from future PATH Study waves can provide information on tobacco use trajectories following experimentation with flavored compared with nonflavored products.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Funding/Support: Funded by the National Institute on Drug Abuse (NIDA), National Institutes of Health, and the US Food and Drug Administration (FDA), Department of Health and Human Services, under contract HHSN271201100027C.

Role of the Funders/Sponsors: Staff from the NIDA and the FDA contributed to the design and conduct of the study; management, analysis, and interpretation of the data; preparation, review, and approval of the manuscript; and the decision to submit the manuscript for publication. The NIDA and the FDA were not directly involved in the collection of study data.

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JAMA. Author manuscript; available in PMC 2019 April 16.

Table 1.

Prevalence of Ever and Past 30-Day Use of Tobacco Products, Proportion of Ever Users Reporting That the First Product Used Was Flavored, and Proportion of Past 30-Day Users Reporting Use of a Flavored Product, by Product–Population Assessment of Tobacco and Health Study Youth Respondents Aged 12–17 Years, 2013–2014

	Ever Product Use				Past 30-d Tobacco Product Use			
	Prevalence of Ever Product Use[a,b]		Proportion of Ever Users Reporting First Product Used Was Flavored[a,c]		Prevalence of Past 30-d Product Use[a,d]		Proportion of Flavored Use Among Past 30-d Youth Tobacco Users[a,e]	
Tobacco Product	Unweighted, No.	Weighted, % (95% CI)	Unweighted, No.	Weighted, % (95% CI)	Unweighted, No.	Weighted, % (95% CI)	Unweighted, No.	Weighted, % (95% CI)
Any tobacco[f]	2900	21.4 (20.4–22.4)	2256	80.8 (79.1–82.5)	1152	8.5 (7.9–9.1)	919	79.8 (77.3–82.3)
Cigarettes	1838	13.4 (12.6–14.2)	902	50.1 (47.1–53.1)	634	4.6 (4.2–5.0)	383	59.5 (55.1–64.0)
e-Cigarettes	1452	10.7 (10.0–11.3)	1154	81.0 (78.5–83.5)	418	3.1 (2.7–3.5)	354	85.3 (81.2–89.5)
Any cigars[g]	1048	7.6 (7.1–8.2)	652	65.4 (62.4–68.3)	340	2.5 (2.2–2.7)	245	71.7 (65.9–77.4)
Hookahs	1006	7.4 (6.8–8.1)	877	88.7 (86.6–90.7)	226	1.7 (1.3–2.0)	198	89.0 (84.8–93.1)
Smokeless tobacco (excluding snus)	574	4.4 (3.9–4.8)	391	68.9 (64.7–73.1)	180	1.4 (1.2–1.7)	146	81.0 (75.7–86.2)
Snus pouches	227	1.7 (1.4–2.0)	184	81.2 (75.9–86.4)	64	0.5 (0.4–0.6)	54	80.4 (70.5–90.4)
Pipes	259	1.9 (1.6–2.1)	77	29.4 (23.2–35.6)	41	0.3 (0.2–0.4)[h]	14	NA[h]

Abbreviation: NA, not available (suppressed).

[a] Individuals whose response was missing or who responded “don’t know” were excluded from the denominator.

[b] Defined as ever having used the product, even 1 to 2 puffs or times. Excluded from denominator: n = 141 for any tobacco, n = 20 for cigarettes; n = 21 for e-cigarettes, n = 5 for any cigars, n = 9 for hookahs, n = 120 for smokeless tobacco, n = 120 for snus pouches, and n = 6 for pipes.

[c] Excluded from denominator: n = 107 ever any tobacco users, n = 53 ever cigarette smokers, n = 22 ever e-cigarette users, n = 54 ever any cigar users, n = 14 ever hookah users, n = 9 ever smokeless tobacco users, n = 2 ever snus pouch users, and n = 7 ever pipe tobacco smokers.

[d] Excluded from denominator: n = 74 for any tobacco, n = 18 for cigarettes, n = 30 for e-cigarettes, n = 9 for cigars, n = 7 for hookahs, n = 13 for smokeless tobacco products, n = 2 for snus pouches, and n = 10 for pipes.

[e] Excluded from denominator: n = 1 for cigarettes and n = 1 for cigars.

[f] Represents combination of cigarette, e-cigarette, any cigar, hookah, smokeless tobacco, snus pouch, pipe, bidi, kretek, and dissolvable tobacco product use. Estimates of ever and current use of bidis, kreteks, and dissolvable tobacco products are not presented owing to small sample sizes of product users.

[g] Respondents who indicated ever having used a cigar were asked about use of traditional cigars, cigarillos, and filtered cigars separately. Respondents indicating use of 2 or more types of cigars (traditional, cigarillo, filtered cigars) were asked about the flavor status of each type of cigar separately. Any respondent who reported ever using 2 or more types of cigars had their responses aggregated, so that if any of the first traditional, cigarillo, or filtered cigars they used were flavored, they were included in the estimate of ever cigar users reporting that their first cigar was flavored. Likewise, respondents who reported using 2 or more types of cigars in the past 30 days and reported past 30-day flavored use of any cigar were included in the estimate of flavored cigar use among past 30-day cigar users.

[h] Past 30-day use estimates for pipes are flagged because of unstable estimates (relative standard error >30%); proportion of flavored product use among past 30-day pipe users are suppressed because of small denominators (<50).

Table 2.

Leading Reasons for Noncigarette Tobacco Product Use Among Past 30-Day Tobacco Users, by Product–Population Assessment of Tobacco and Health Study Youth Respondents Aged 12–17 Years, 2013–2014 [a,b]

	% (95% CI)				
Reasons for Use	**e-Cigarettes (n = 418)[c]**	**Any Cigars (n = 340)[c,d]**	**Hookahs (n = 226)[c]**	**Smokeless Tobacco (n = 180)[c]**	**Snus Pouches (n = 64)[c]**
I use [product] because they come in flavors I like	81.5 (77.9–85.0)	73.8 (68.2–79.4)	78.9 (73.4–84.3)	69.3 (62.6–76.0)	67.2 (55.7–78.6)
I use [product] because they are affordable	47.8 (42.9–52.6)	58.2 (52.7–63.6)	43.7 (36.5–51.0)	60.6 (52.6–68.6)	45.5 (32.1–58.8)
I use [product] because I can smoke/use them at times when or in places where smoking cigarettes isn't allowed	58.9 (54.1–63.7)	10.9 (7.1–14.8)	30.8 (24.1–37.5)	69.7 (63.3–76.0)	70.7 (58.7–82.7)
I use [product] because I like socializing while using them	40.3 (34.9–45.8)	57.0 (51.7–62.4)	79.6 (74.6–84.5)	NA	NA
I use [product] because it doesn't bother non-tobacco users	53.9 (48.1–59.8)	NA	NA	47.7 (40.4–55.0)	50.4 (39.7–61.2)
I use [product] because they might be less harmful to me than cigarettes	79.1 (75.2–83.0)	29.9 (25.3–34.5)	60.6 (53.9–67.3)	51.4 (44.3–58.4)	36.9 (24.3–49.6)
I use [product] because they might be less harmful to people around me than cigarettes	78.1 (74.3–81.8)	NA	NA	68.3 (62.1–74.6)	51.4 (38.7–64.2)
I use [product] because they don't smell	58.7 (54.2–63.2)	NA	NA	33.3 (27.4–39.1)	34.2 (22.1–46.4)
I use [product] because they help people to quit smoking cigarettes	59.5 (54.6–64.5)	9.9 (6.6–13.2)	24.2 (18.1–30.2)	26.8 (21.2–32.5)	25.1 (15.1–35.1)
I use [product] because people who are important to me use them	34.9 (30.6–39.2)	28.4 (23.5–33.2)	35.9 (30.3–41.6)	40.7 (32.9–48.6)	28.8 (17.8–39.7)
I use [product] because people in the media or other public figures use them	36.1 (31.5–40.7)	30.7 (26.1–35.4)	28.8 (22.7–35.0)	27.4 (20.8–34.1)	23.8 (13.2–34.5)

Abbreviation: NA, not asked.

[a] Past 30-day noncigarette tobacco users were asked to indicate (yes/no) whether particular reasons applied to their use of each specific product. A set of 14 items were asked of e-cigarette, smokeless tobacco, snus pouch, and dissolvable tobacco users; 10 were asked of cigar and hookah smokers; and a set of 9 were asked of pipe smokers and users of bidis and kreteks. Items can be accessed on the PATH Youth Baseline Questionnaire available in the eAppendix in the Supplement.

[b] Individuals whose response was missing or responded "don't know" to whether they used products in the past 30 days were excluded from the denominator, including n = 30 for e-cigarettes, n = 9 for cigars, n = 7 for hookahs, n = 13 for smokeless tobacco, and n = 2 for snus pouches. Estimates for pipe, dissolvable tobacco, bidi, and kretek users are not presented owing to small denominators of past 30-day users (n <50). Cited sample sizes reflect unweighted Ns.

[c] Past 30-day users whose response was missing or who responded "don't know" to any item regarding reasons for use were excluded from the denominator (range of missing for each item, by product: n = 0–5 for cigars, n = 0–4 for e-cigarettes and hookahs, n = 0–3 for smokeless tobacco, and n = 0–1 for snus pouches).

[d] Questions regarding reasons for use were asked separately for past 30-day use of traditional cigar, cigarillo, and filtered cigar. Any respondents reporting past 30-day use of 2 or more types of cigars were asked to report on reasons for use for each type of cigar separately. Responses were aggregated so that if the reason was endorsed for any of the types of cigars, it was counted overall as a positive response.