

Awareness and Use of Non-conventional Tobacco Products Among U.S. Students, 2012

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Background: Increasing diversity of the tobacco product landscape, including electronic cigarettes (e-cigarettes), hookah, snus, and dissolvable tobacco products (dissolvables), raises concerns about the public health impact of these non-conventional tobacco products among youth.

Purpose: This study assessed awareness, ever use, and current use of non-conventional tobacco products among U.S. students in 2012, overall and by demographic and tobacco use characteristics.

Methods: Data from the 2012 National Youth Tobacco Survey, a nationally representative survey of U.S. middle and high school students, were analyzed in 2013. Prevalence of awareness, ever use, and current use of e-cigarettes, hookah, snus, and dissolvables were calculated overall and by sex, school level, race/ethnicity, and conventional tobacco product use, including cigarettes, cigars, or smokeless tobacco (chewing tobacco, snuff, or dip).

Results: Overall, 50.3% of students were aware of e-cigarettes; prevalence of ever and current use of e-cigarettes was 6.8% and 2.1%, respectively. Awareness of hookah was 41.2% among all students, and that of ever and current use were 8.9% and 3.6%, respectively. Overall awareness; ever; and current use of snus (32%, 5.3%, 1.7%, respectively) and dissolvables (19.3%, 2.0%, 0.7%, respectively) were generally lower than those of e-cigarettes or hookah. Conventional tobacco product users were more likely to be aware of and to use non-conventional tobacco products.

Conclusions: Many U.S. students are aware of and use non-conventional tobacco products. Evidence-based interventions should be implemented to prevent and reduce all tobacco use among youth.

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Introduction

Although the prevalence of cigarette smoking among U.S. high school students has declined over the past decade,¹ the tobacco product landscape has become more diverse during the same period. New products have been introduced to the U.S. market, including electronic cigarettes (e-cigarettes), snus, and dissolvable tobacco products (dissolvables). Additionally, hookah (also known as water pipe, shisha, or narghile smoking), used historically in other regions of the world, has become more popular in the U.S. According to the

National Youth Tobacco Survey (NYTS), the prevalence of lifetime and past 30-day use of e-cigarettes doubled among U.S. middle and high school students during 2011–2012, to 6.8% and 2.1%, respectively.² Current use of hookah and dissolvables also increased among U.S. middle and high school students during this period.³

These non-conventional tobacco products raise several concerns related to their impact on youth. Concerns include the risk of nicotine addiction, toxic effects of non-conventional products, and the potential negative impact of nicotine on adolescent brain development.⁴ Further, the extent to which non-conventional product use may increase the likelihood of initiating cigarettes or other conventional tobacco products, or sustain use among those who might otherwise quit tobacco, is uncertain.^{5,6} Although data on the health effects in U.S. populations are limited, non-conventional products have been found to contain toxicants, carcinogens, and other harmful constituents, albeit with the exception of hookah generally at much lower levels than combusted products such as cigarettes.^{7–15}

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Some non-conventional tobacco products, including e-cigarettes and hookah, are not currently regulated by the U.S. Food and Drug Administration (FDA) under the 2009 Family Smoking Prevention and Tobacco Control Act and therefore are not subject to the same restrictions on manufacturing, marketing, and distribution that apply to conventional cigarettes and smokeless tobacco products. Moreover, unregulated tobacco products, such as e-cigarettes, can be purchased without age restriction in many states and on the Internet,^{16–18} and they are being promoted through media channels that youth are commonly exposed to, such as TV.^{19,20}

Little is known about use of non-conventional tobacco products among youth. Previous studies have focused on awareness or use of e-cigarettes, hookah, snus, or dissolvables among adults^{21–30} and college students.^{31–40} However, comparable measures among national samples of youth have been limited until recently.^{2,3,41,42} No studies have assessed the prevalence and characteristics of youth awareness and ever use of non-conventional tobacco products at the national level.

Given the concerns about the potential public health impact of non-conventional tobacco product use among youth, it is critical to monitor youth use of non-conventional tobacco products as part of broader tobacco monitoring activities in order to inform decisions on prevention of tobacco use among youth. To understand the spectrum of awareness and use of non-conventional tobacco products among youth in the U.S., data from the 2012 NYTS were analyzed to (1) estimate the prevalence of awareness, ever use, and current use of e-cigarettes, hookah, snus, and dissolvables among U.S. middle and high school students and (2) characterize patterns of awareness, ever use, and current use by selected demographic factors and other tobacco use.

Methods

Sample

NYTS is an ongoing, nationally representative, school-based survey focusing on tobacco-related measures. It uses a stratified three-stage cluster sample design to produce cross-sectional, nationally representative estimates of U.S. middle (Grades 6–8) and high school (Grades 9–12) students. Details of NYTS methodology are described elsewhere.⁴³ The CDC's IRB approved the NYTS data collection protocol. Of the 284 schools selected for participation in 2012 NYTS, 228 (80.3%) participated. A total of 24,658 (91.7%) surveys were completed by students in these schools, yielding an overall response rate of 73.6%.

Measures

Survey respondents were asked whether they had ever heard of, ever used, and currently use the following four non-conventional tobacco products: *electronic cigarettes or e-cigarettes, such as Ruyan or NJOY, smoking tobacco from a hookah or a waterpipe,*

snus, such as Camel or Marlboro Snus, and dissolvable tobacco products such as Ariva, Stonewall, Camel orbs, Camel sticks, Marlboro sticks, or Camel strips.

For each non-conventional tobacco product, awareness was defined by whether the product was selected in response to the question *Which of the following tobacco products have you ever heard of?* Ever use was defined by whether the product was selected in response to the question *Which of the following products have you ever tried, even just one time?* Current use was defined by whether each product was selected in response to the question *During the past 30 days, which of the following products have you used on at least one day?*

Demographic characteristics included school level (middle or high); sex (male or female); and race/ethnicity (Hispanic, non-Hispanic white, non-Hispanic black, and other non-Hispanic, which included non-Hispanic Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, or those identifying as more than one race/ethnicity group). Respondents were asked about conventional tobacco product use, including (1) cigarettes; (2) cigars, cigarillos, or little cigars; and (3) smokeless tobacco (chewing tobacco, snuff, or dip). Ever use of conventional tobacco products was defined as *yes* to ever trying, even once or twice, any of the three products. Current use was defined as using any of the three products on at least 1 day in the past 30 days.

Ever conventional cigarette-only smoking defined as a response of *yes* to ever trying cigarette smoking, even one or two puffs and never trying any other tobacco products (excluding each of the four assessed non-conventional products). Current cigarette-only smoking was defined as having smoked cigarettes on at least 1 of the past 30 days and not using any other tobacco product (excluding each of the four assessed non-conventional products). Those who reported a combination of only *no* and missing product use responses were assigned as missing for conventional product use and cigarette-only smoking.

Data Analysis

Data were analyzed in 2013 using SAS-callable SUDAAN, version 11 (RTI International, Research Triangle Park NC) to provide weighted results that account for the complex sample design. Prevalence estimates and 95% CIs were calculated for awareness, ever use, and current use of e-cigarettes, hookah, snus, and dissolvables. Weighted population totals corresponding to estimates of overall use of each product were also calculated.

Data were stratified by school level, and estimates were reported overall and by sex, race/ethnicity, and ever and current use of conventional tobacco products, cigarette-only smoking, and other non-conventional tobacco products (i.e., other than those for prevalence estimate). Differences between estimates were considered statistically significant if the 95% CIs did not overlap. Estimates with a relative SE of 40% or greater or a denominator less than 50 were not reported.

Results

Table 1 shows selected characteristics of the survey participants. Of students who completed the survey,

Table 1. Selected characteristics of survey participants, 2012 National Youth Tobacco Survey

	<i>n</i>	% (95% CI)
OVERALL	24,658	
MIDDLE SCHOOL	11,667	43.9 (39.4, 48.4)
Sex		
Female	5,797	49.0 (47.9, 50.0)
Male	5,865	51.0 (50.0, 52.1)
Race/ethnicity		
White, non-Hispanic	5,687	52.6 (46.9, 58.3)
Black, non-Hispanic	1,366	13.7 (9.2, 19.8)
Hispanic	2,614	22.9 (19.5, 26.8)
Other non-Hispanic ^a	1,488	10.8 (8.9, 13.0)
Ever used conventional tobacco products^b		
Yes	1,967	17.2 (15.2, 19.4)
No	9,339	82.8 (80.6, 84.8)
Currently use conventional tobacco products		
Yes	678	5.7 (4.9, 6.6)
No	10,615	94.3 (93.4, 95.1)
HIGH SCHOOL	12,899	56.1 (51.6, 60.6)
Sex		
Female	6,439	48.9 (47.7, 50.1)
Male	6,458	51.1 (49.9, 52.3)
Race/ethnicity		
White, non-Hispanic	6,114	54.9 (49.5, 60.1)
Black, non-Hispanic	1,741	14.0 (11.0, 17.6)
Hispanic	3,098	20.7 (17.4, 24.4)
Other non-Hispanic ^a	1,711	10.5 (8.6, 12.7)
Ever used conventional tobacco products^b		
Yes	5,798	44.7 (42.0, 47.5)
No	6,886	55.3 (52.5, 58.0)
Currently use conventional tobacco products^b		
Yes	2,755	21.7 (20.0, 23.6)
No	9,879	78.3 (76.4, 80.0)

^aOther non-Hispanic race/ethnicity includes non-Hispanic Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and multi-race.

^bConventional tobacco products include cigarettes, cigars/cigarillos/little cigars, or smokeless tobacco. Ever use was defined as tried at least one conventional tobacco product one or more times. Current use was defined as used at least one conventional tobacco product on at least 1 of the past 30 days.

17.2% and 5.7% of middle school students reported ever and current use of conventional tobacco products,

respectively. Among high school students, 44.7% and 21.7% reported ever and current use of conventional tobacco products, respectively.

Overall, awareness of one or more non-conventional tobacco products was 64.6%, corresponding to a total of 16.8 million students; awareness was 55.5% and 71.6% among middle and high school students, respectively. Ever use of one or more non-conventional products was 14.9% overall, or 3.9 million students; ever use was 6.1% and 21.7% among middle and high school students, respectively. Current use of one or more non-conventional products was 6.2% overall, or 1.6 million students, and 2.7% and 8.8% among middle and high school students, respectively.

Ever and current use were highest for hookah, followed by e-cigarettes, snus, and dissolvables. Among ever users of non-conventional tobacco products, 1% (ever snus users) to 7.5% (ever hookah users) had never used conventional tobacco products. Among current users of non-conventional tobacco products, the proportion of students who did not report current use of conventional products ranged from 3.6% among snus users to 22.8% among hookah users.

Awareness of e-cigarettes was 50.3% overall, corresponding to a total of 13.1 million students; awareness was 40.8% and 57.6% among middle and high school students, respectively (Table 2). Ever use of e-cigarettes was 6.8% overall, or 1.8 million students; ever use was 2.7% and 10.0% among middle and high school students, respectively. Current use of e-cigarettes was 2.1% overall, or 550,000 students; current use was 1.1% and 2.8% among middle and high school students, respectively.

Overall, levels of awareness were similar among male and female students, but ever and current use were higher among male than female students. Awareness, ever use, and current use were highest among non-Hispanic white students and lowest among non-Hispanic black students. Ever or current users of conventional products, current cigarette-only smokers, and ever or current users of other non-conventional

products were more likely than non-users to be aware of and use e-cigarettes.

Table 2. Prevalence of awareness, ever use, and current use of e-cigarettes, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI)

Characteristics	Awareness	Ever use	Current use
OVERALL	50.3 (48.5, 52.0)	6.8 (5.9, 7.8)	2.1 (1.8, 2.5)
Sex			
Female	48.6 (46.6, 50.6)	5.5 (4.7, 6.4)	1.4 (1.2, 1.7)
Male	51.9 (50.0, 53.8)	8.1 (7.0, 9.3)	2.8 (2.2, 3.5)
Race/ethnicity			
White, non-Hispanic	58.6 (56.5, 60.7)	8.1 (7.0, 9.5)	2.3 (1.9, 2.8)
Black, non-Hispanic	32.9 (30.0, 35.9)	3.3 (2.6, 4.1)	1.2 (0.7, 1.8)
Hispanic	41.1 (38.3, 44.0)	6.2 (5.0, 7.6)	2.4 (1.9, 3.2)
Other non-Hispanic ^a	51.6 (47.1, 56.0)	6.1 (4.6, 8.0)	1.9 (1.2, 2.9)
Ever used conventional tobacco products^b			
Yes	62.6 (59.9, 65.2)	20.3 (18.3, 22.5)	6.2 (5.3, 7.3)
No	44.7 (42.9, 46.4)	0.5 (0.4, 0.7)	0.2 (0.1, 0.3)
Currently use conventional tobacco products^b			
Yes	66.0 (62.7, 69.2)	32.2 (29.0, 35.6)	12.9 (11.0, 15.0)
No	47.7 (45.9, 49.5)	2.5 (2.2, 2.9)	0.3 (0.2, 0.5)
Ever smoked only conventional cigarettes^c			
Yes	56.4 (52.8, 60.0)	8.9 (6.5, 12.1)	1.7 (1.0, 3.0)
No	50.2(48.4, 52.0)	6.6 (5.8, 7.6)	2.1 (1.7, 2.5)
Currently smoke only conventional cigarettes^c			
Yes	70.9 (64.8, 76.3)	32.2 (26.9, 38.0)	9.7 (7.2, 12.9)
No	50.0 (48.2, 51.7)	6.1 (5.3, 6.9)	1.9 (1.6, 2.3)
Ever used other non-conventional tobacco products^d			
Yes	76.9 (74.3, 79.3)	34.0 (31.0, 37.2)	11.8 (10.0, 13.8)
No	46.3 (44.6, 48.1)	3.0 (2.5, 3.5)	0.8 (0.6, 1.0)
Currently use other non-conventional tobacco products^d			
Yes	74.2 (69.9, 78.0)	38.1 (34.0, 42.4)	19.0 (16.2, 22.2)
No	48.9 (47.1, 50.7)	4.9 (4.3, 5.7)	1.2 (1.0, 1.5)
MIDDLE SCHOOL	40.8 (38.9, 42.8)	2.7 (2.2, 3.2)	1.1 (0.9, 1.5)
Sex			
Female	39.4 (37.2, 41.6)	2.4 (1.9, 3.0)	0.8 (0.5, 1.1)
Male	42.2 (40.0, 44.5)	3.0 (2.4, 3.6)	1.5 (1.1, 2.1)
Race/ethnicity			
White, non-Hispanic	45.9 (43.6, 48.2)	2.5 (2.0, 3.1)	0.9 (0.6, 1.3)
Black, non-Hispanic	31.3 (25.4, 37.8)	2.4 (1.3, 4.4)	1.1 (0.6, 2.3)
Hispanic	34.0 (30.2, 37.9)	3.3 (2.3, 4.6)	2.0 (1.4, 2.9)
Other non-Hispanic ^a	44.4 (39.6, 49.4)	2.4 (1.4, 4.3)	— ^e

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Table 2. Prevalence of awareness, ever use, and current use of e-cigarettes, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI) (continued)

Characteristics	Awareness	Ever use	Current use
Ever used conventional tobacco products^b			
Yes	51.1 (47.8, 54.4)	13.8 (12.0, 15.9)	5.8 (4.7, 7.3)
No	38.9 (37.0, 40.8)	0.4 (0.3, 0.6)	0.2 (0.1, 0.3)
Currently use conventional tobacco products^b			
Yes	50.2 (45.6, 54.8)	22.1 (18.7, 26.0)	15.3 (11.6, 20.0)
No	40.1 (38.2, 42.1)	1.5 (1.2, 1.8)	0.3 (0.2, 0.5)
Ever smoked only conventional cigarettes^c			
Yes	49.3 (41.8, 56.8)	9.5 (4.7, 18.3)	— ^e
No	40.5 (38.6, 42.5)	2.3 (1.8, 2.8)	1.0 (0.7, 1.3)
Currently smoke only conventional cigarettes^c			
Yes	51.7 (35.1, 68.1)	19.2 (9.7, 34.5)	— ^e
No	40.7 (38.7, 42.7)	2.3 (1.9, 2.8)	1.0 (0.8, 1.3)
Ever used other non-conventional tobacco products^d			
Yes	66.2 (58.6, 73.0)	26.6 (22.1, 31.7)	13.6 (10.4, 17.6)
No	39.3 (37.4, 41.3)	1.5 (1.2, 1.9)	0.6 (0.4, 0.8)
Currently use other non-conventional tobacco products^d			
Yes	62.3 (52.1, 71.6)	29.9 (23.3, 37.6)	23.8 (17.0, 32.3)
No	40.3 (38.4, 42.3)	2.1 (1.7, 2.6)	0.7 (0.5, 1.0)
HIGH SCHOOL	57.6 (54.7, 60.4)	10.0 (8.6, 11.6)	2.8 (2.3, 3.5)
Sex			
Female	55.8 (52.8, 58.8)	8.0 (6.7, 9.5)	1.9 (1.5, 2.4)
Male	59.3 (56.0, 62.5)	12.0 (10.2, 14.1)	3.7 (2.9, 4.8)
Race/ethnicity			
White, non-Hispanic	67.9 (64.7, 70.9)	12.3 (10.4, 14.4)	3.3 (2.6, 4.2)
Black, non-Hispanic	34.0 (29.7, 38.5)	3.9 (3.0, 5.0)	1.2 (0.7, 2.0)
Hispanic	47.1 (43.7, 50.5)	8.5 (6.6, 10.8)	2.7 (1.9, 3.8)
Other non-Hispanic ^a	57.2 (51.4, 62.8)	9.0 (6.8, 11.9)	2.8 (1.8, 4.5)
Ever used conventional tobacco products^b			
Yes	65.9 (62.5, 69.2)	22.2 (19.6, 25.0)	6.3 (5.2, 7.6)
No	51.3 (48.4, 54.2)	0.6 (0.4, 0.9)	0.2 (0.1, 0.4)
Currently use conventional tobacco products^b			
Yes	69.2 (65.1, 73.0)	34.2 (30.4, 38.2)	12.3 (10.3, 14.6)
No	54.7 (51.8, 57.5)	3.5 (2.9, 4.1)	0.4 (0.2, 0.6)
Ever smoked only conventional cigarettes^c			
Yes	59.7 (55.2, 64.1)	8.6 (6.4, 11.3)	1.4 (0.6, 2.9)
No	57.8 (54.9, 60.7)	10.1 (8.7, 11.7)	2.9 (2.3, 3.6)

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Table 2. Prevalence of awareness, ever use, and current use of e-cigarettes, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI) (continued)

Characteristics	Awareness	Ever use	Current use
Currently smoke only conventional cigarettes^c			
Yes	74.8 (68.6, 80.1)	34.7 (28.8, 41.2)	9.5 (6.9, 13.0)
No	57.3 (54.5, 60.1)	9.0 (7.7, 10.5)	2.6 (2.0, 3.2)
Ever used other non-conventional tobacco products^d			
Yes	79.0 (76.4, 81.4)	35.4 (32.0, 39.0)	11.2 (9.4, 13.4)
No	52.8 (49.8, 55.7)	4.3 (3.6, 5.2)	1.0 (0.8, 1.4)
Currently use other non-conventional tobacco products^d			
Yes	76.9 (72.5, 80.7)	39.7 (35.1, 44.6)	17.7 (14.5, 21.4)
No	56.0 (53.1, 58.9)	7.3 (6.2, 8.5)	1.7 (1.3, 2.1)

^aOther non-Hispanic race/ethnicity includes non-Hispanic Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and multi-race.

^bConventional tobacco products include cigarettes, cigars/cigarillos/little cigars, or smokeless tobacco. Ever use was defined as tried at least one conventional tobacco product one or more times. Current use was defined as used at least one conventional tobacco product on at least 1 of the past 30 days.

^cEver smoked only conventional cigarettes was defined as a response of yes to ever trying cigarette smoking, even one or two puffs, and never trying any other tobacco product (excluding e-cigarettes). Current cigarette-only smoking was defined as having smoked cigarettes on at least 1 of the past 30 days and not using any other tobacco product (excluding e-cigarettes).

^dOther non-conventional tobacco products include hookah, snus, or dissolvables. Ever use was defined as tried at least one non-conventional product one or more times. Current use was defined as used at least one non-conventional tobacco product on 1 or more of the past 30 days.

^eEstimate not shown because the relative SE was 40% or greater or denominator less than 50.

Awareness of hookah was 41.2% overall, corresponding to a total of 10.7 million students; 28.1% and 51.3% among middle and high school students were aware of hookah, respectively (Table 3). Ever use of hookah was 8.9% overall, or 2.3 million students; ever use was 2.7% and 13.6% among middle and high school students, respectively. Current use of hookah was 3.6% overall, or 950,000 students; current use was 1.3% and 5.4% among middle and high school students, respectively.

Overall, levels of awareness were similar among male and female students. Ever use was comparable among male and female students, but current use was greater among males than female students. Non-Hispanic black students were less likely to be aware of or to be ever users of hookah than other races/ethnicities. Current use was lower among non-Hispanic black students than non-Hispanic white and Hispanic students. Ever or current users of conventional products, current cigarette-only smokers, and ever or current users of other non-conventional products had greater awareness, ever use, and current use of hookah compared to non-users.

Awareness of snus was 32.0% overall, corresponding to a total of 8.3 million students; awareness was 26.3% and 36.5% among middle and high school students, respectively (Table 4). Ever use of snus was 5.3% overall, or 1.4 million students; ever use was 2.1% and 7.7% among middle and high school students, respectively. Current use of snus was 1.7% overall, or 450,000

students; current use was 0.8% and 2.5% among middle and high school students, respectively.

Overall, awareness, ever use, and current use were greater among male than female students. Awareness and ever use were lower among non-Hispanic black students than other races/ethnicities. Current use was lower among non-Hispanic black students than Hispanic and non-Hispanic white students. Generally, ever or current users of conventional products, current cigarette-only smokers, and ever or current users of other non-conventional products had greater awareness, ever use, and current use of snus than non-users.

Awareness of dissolvables was 19.3% overall, corresponding to a total of 5.0 million students; awareness was 18.2% and 20.0% among middle and high school students, respectively (Table 5). Ever use of dissolvables was 2.0% overall, or 530,000 students; ever use was 1.4% and 2.5% among middle and high school students, respectively. Current use of dissolvables was 0.7% overall, or 190,000 students; current use was 0.5% and 0.8% among middle and high school students, respectively.

Overall, awareness, ever use, and current use were similar among male and female students. Non-Hispanic black students had lower awareness of dissolvables than all other races/ethnicities. Ever or current users of conventional products, current cigarette-only smokers, and ever or current users of other non-conventional products had greater ever and current use of dissolvables than non-users.

Table 3. Prevalence of awareness, ever use, and current use of hookah, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI)

Characteristics	Awareness	Ever use	Current use
OVERALL	41.2 (39.4, 43.1)	8.9 (7.9, 9.9)	3.6 (3.1, 4.2)
Sex			
Female	42.1 (40.0, 44.1)	8.0 (7.0, 9.1)	3.0 (2.5, 3.5)
Male	40.4 (38.4, 42.4)	9.7 (8.7, 10.9)	4.2 (3.6, 4.9)
Race/ethnicity			
White, non-Hispanic	47.3 (44.9, 49.7)	10.2 (8.8, 11.7)	3.9 (3.3, 4.6)
Black, non-Hispanic	19.9 (17.1, 23.0)	3.1 (2.4, 4.0)	1.5 (1.1, 2.0)
Hispanic	40.7 (37.4, 44.0)	10.6 (9.1, 12.3)	5.0 (4.0, 6.3)
Other non-Hispanic ^a	41.6 (39.2, 43.9)	7.2 (5.9, 8.9)	2.4 (1.7, 3.3)
Ever used conventional tobacco products^b			
Yes	56.8 (53.6, 59.9)	25.8 (23.4, 28.4)	10.6 (9.3, 12.1)
No	34.0 (32.3, 35.8)	1.0 (0.8, 1.3)	0.4 (0.3, 0.5)
Currently use conventional tobacco products^b			
Yes	62.7 (59.3, 66.0)	39.2 (35.6, 43.0)	19.8 (17.3, 22.5)
No	37.9 (36.1, 39.7)	3.8 (3.3, 4.4)	1.0 (0.8, 1.2)
Ever smoked only conventional cigarettes^c			
Yes	43.3 (38.6, 48.2)	7.4 (5.7, 9.6)	2.2 (1.5, 3.3)
No	41.3 (39.5, 43.2)	9.0 (8.0, 10.1)	3.7 (3.2, 4.2)
Currently smoke only conventional cigarettes^c			
Yes	60.5 (54.4, 66.3)	28.9 (24.0, 34.4)	8.3 (5.6, 12.1)
No	40.9 (39.0, 42.7)	8.3 (7.3, 9.3)	3.4 (2.9, 3.9)
Ever used other non-conventional tobacco products^d			
Yes	72.9 (69.8, 75.9)	42.6 (38.9, 46.4)	18.0 (15.5, 20.7)
No	37.3 (35.5, 39.1)	4.9 (4.3, 5.6)	2.0 (1.7, 2.4)
Currently use other non-conventional tobacco products^d			
Yes	72.7 (68.2, 76.8)	51.5 (46.6, 56.5)	29.8 (26.1, 33.8)
No	39.9 (38.1, 41.7)	7.0 (6.2, 7.8)	2.6 (2.2, 3.1)
MIDDLE SCHOOL	28.1 (26.4, 29.9)	2.7 (2.1, 3.3)	1.3 (1.0, 1.7)
Sex			
Female	29.3 (27.4, 31.2)	2.5 (1.8, 3.4)	1.0 (0.7, 1.4)
Male	27.0 (24.9, 29.3)	2.8 (2.3, 3.6)	1.5 (1.1, 2.2)
Race/ethnicity			
White, non-Hispanic	29.9 (27.9, 32.0)	2.2 (1.6, 2.9)	0.9 (0.6, 1.3)
Black, non-Hispanic	15.7 (12.5, 19.4)	1.5 (0.9, 2.5)	0.9 (0.4, 1.9)
Hispanic	29.9 (26.6, 33.8)	5.1 (3.8, 6.8)	3.0 (2.2, 4.1)
Other non-Hispanic ^a	31.7 (28.5, 35.2)	1.6 (0.9, 3.1)	— ^e

(continued on next page)

Table 3. Prevalence of awareness, ever use, and current use of hookah, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI) (continued)

Characteristics	Awareness	Ever use	Current use
Ever used conventional tobacco products^b			
Yes	43.1 (39.3, 47.0)	14.3 (11.6, 17.4)	6.7 (5.3, 8.5)
No	25.3 (23.5, 27.1)	0.4 (0.3, 0.7)	0.2 (0.1, 0.4)
Currently use conventional tobacco products^b			
Yes	46.7 (42.4, 51.1)	25.1 (20.6, 30.1)	16.3 (12.6, 20.8)
No	27.2 (25.4, 29.1)	1.4 (1.0, 1.8)	0.4 (0.3, 0.6)
Ever smoked only conventional cigarettes^c			
Yes	30.3 (22.8, 39.1)	4.0 (2.2, 7.4)	— ^e
No	28.1 (26.3, 29.8)	2.5 (2.0, 3.2)	1.2 (0.9, 1.6)
Currently smoke only conventional cigarettes^c			
Yes	39.7 (29.8, 50.5)	— ^e	— ^e
No	28.0 (26.3, 29.9)	2.5 (1.9, 3.1)	1.1 (0.8, 1.5)
Ever used other non-conventional tobacco products^d			
Yes	59.5 (53.1, 65.6)	27.9 (23.1, 33.2)	13.3 (9.9, 17.6)
No	26.4 (24.7, 28.2)	1.4 (1.0, 1.9)	0.7 (0.5, 1.0)
Currently use other non-conventional tobacco products^d			
Yes	59.7 (51.7, 67.2)	37.3 (29.9, 45.3)	26.3 (17.8, 36.9)
No	27.5 (25.7, 29.3)	1.9 (1.5, 2.4)	0.8 (0.6, 1.1)
HIGH SCHOOL	51.3 (48.5, 54.1)	13.6 (12.1, 15.3)	5.4 (4.6, 6.3)
Sex			
Female	52.0 (49.0, 55.0)	12.2 (10.6, 13.9)	4.5 (3.7, 5.4)
Male	50.7 (47.6, 53.7)	15.0 (13.3, 16.9)	6.2 (5.3, 7.3)
Race/ethnicity			
White, non-Hispanic	59.9 (56.5, 63.1)	16.0 (13.9, 18.3)	6.2 (5.2, 7.3)
Black, non-Hispanic	22.8 (18.0, 28.5)	4.2 (3.0, 5.8)	1.9 (1.4, 2.7)
Hispanic	49.7 (46.0, 53.4)	15.1 (13.0, 17.5)	6.6 (5.1, 8.5)
Other non-Hispanic ^a	49.2 (45.7, 52.8)	11.7 (9.4, 14.4)	4.0 (2.9, 5.4)
Ever used conventional tobacco products^b			
Yes	60.7 (56.9, 64.4)	29.1 (26.2, 32.1)	11.6 (10.0, 13.4)
No	44.0 (41.1, 46.9)	1.6 (1.2, 2.2)	0.6 (0.4, 0.9)
Currently use conventional tobacco products^b			
Yes	65.8 (61.9, 69.5)	41.9 (37.8, 46.1)	20.3 (17.5, 23.5)
No	47.7 (44.9, 50.5)	6.0 (5.1, 7.0)	1.5 (1.1, 1.9)
Ever smoked only conventional cigarettes^c			
Yes	49.0 (43.8, 54.1)	8.8 (6.5, 12.0)	2.5 (1.6, 4.0)
No	51.8 (49.1, 54.5)	14.0 (12.4, 15.7)	5.6 (4.8, 6.5)

(continued on next page)

Table 3. Prevalence of awareness, ever use, and current use of hookah, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI) (continued)

Characteristics	Awareness	Ever use	Current use
Currently smoke only conventional cigarettes^c			
Yes	64.4 (57.7, 70.5)	32.1 (26.3, 38.4)	9.1 (6.1, 13.3)
No	51.0 (48.2, 53.9)	12.9 (11.4, 14.5)	5.2 (4.4, 6.0)
Ever used other non-conventional tobacco products^d			
Yes	76.2 (73.2, 78.9)	46.1 (42.2, 50.0)	18.9 (16.2, 22.1)
No	46.8 (43.9, 49.6)	7.9 (6.9, 9.1)	3.1 (2.6, 3.8)
Currently use other non-conventional tobacco products^d			
Yes	76.5 (71.2, 81.1)	55.5 (49.5, 61.3)	30.4 (26.1, 35.2)
No	49.8 (47.0, 52.6)	11.1 (9.8, 12.4)	4.1 (3.4, 4.9)

^aOther non-Hispanic race/ethnicity includes non-Hispanic Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and multi-race.

^bConventional tobacco products include cigarettes, cigars/cigarillos/little cigars, or smokeless tobacco. Ever use was defined as tried at least one conventional tobacco product one or more times. Current use was defined as used at least one conventional tobacco product on at least 1 of the past 30 days.

^cEver smoked only conventional cigarettes was defined as a response of yes to ever trying cigarette smoking, even one or two puffs, and never trying any other tobacco product (excluding hookah). Current cigarette-only smoking was defined as having smoked cigarettes on at least 1 of the past 30 days and not using any other tobacco product (excluding hookah).

^dOther non-conventional tobacco products include e-cigarettes, snus, or dissolvables. Ever use was defined as tried at least one non-conventional product one or more times. Current use was defined as used at least one non-conventional tobacco product on 1 or more of the past 30 days.

^eEstimate not shown because the relative SE was 40% or greater or denominator less than 50.

Discussion

The findings of this study indicate that awareness of e-cigarettes, hookah, snus, and dissolvables is high among U.S. middle and high school students. Nearly two thirds of all students were aware of one or more of these non-conventional tobacco products, and 3.9 million were ever users of one or more of these products. Half of all students reported being aware of e-cigarettes, and 6.8%, or 1.8 million students, had ever used them. Although awareness of hookah was lower compared to that for e-cigarettes, more students reported ever use of hookah. Relative to e-cigarettes and hookah, fewer students are aware of and use snus and dissolvables.

Consistent across all four products, students who were ever or current users of conventional products, current cigarette-only smokers, and ever or current users of other non-conventional products were more likely than non-users to be aware of and use these non-conventional products. This study also found that many ever users of non-conventional products had never used conventional products.

Awareness and ever use of e-cigarettes among middle and high school students are higher than those found in most nationally representative surveys among U.S. adults in 2010.^{21,22,25,26} The only similar estimates were reported from a 2011 national adult web-based survey that found nearly 58% of adults had ever heard of e-cigarettes, and 6.2% had ever used them.²¹ The higher

estimates among middle and high school students in 2012 probably reflect the rapidly increasing popularity of e-cigarettes in recent years. It has been reported that ever use of e-cigarettes among U.S. adults more than quadrupled from 2009 (0.6%) to 2010 (2.7%)²² and nearly doubled during 2010–2011.²¹ Ever and current use of e-cigarettes among U.S. middle and high school students doubled during 2011–2012.²

Nationwide, the prevalence of ever (8.9%) and current (3.6%) hookah use among U.S. middle and high school students in 2012 is much higher than that (7.3% for ever use and 2.6% for current use) in 2011,⁴¹ with a 22% and 38% increase over 1 year, respectively. The prevalence of ever and current hookah use among U.S. high school students in 2012 is lower than estimates reported among high school students in New Jersey and California in 2011,^{44–46} possibly due, in part, to a higher percentage of these states' populations with an Arab background, which is associated with a tradition of hookah use.^{44–49}

Compared with e-cigarettes and hookah, awareness and use of snus and dissolvables are lower. Although the reasons for these lower rates are uncertain, limited market penetration and varying promotional strategies may have played a major role. The NYTS questions on snus included Camel and Marlboro snus as brand examples. These two products were not marketed nationwide until 2009 and 2010, respectively.^{50,51} Moreover,

Table 4. Prevalence of awareness, ever use, and current use of snus, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI)

Characteristics	Awareness	Ever use	Current use
OVERALL	32.0 (30.5, 33.6)	5.3 (4.6, 6.0)	1.7 (1.5, 2.1)
Sex			
Female	28.5 (27.1, 30.0)	3.1 (2.6, 3.6)	0.8 (0.6, 1.0)
Male	35.5 (33.6, 37.5)	7.4 (6.4, 8.6)	2.7 (2.2, 3.3)
Race/ethnicity			
White, non-Hispanic	38.2 (36.4, 40.1)	6.6 (5.6, 7.7)	2.2 (1.8, 2.8)
Black, non-Hispanic	15.6 (13.5, 18.0)	2.1 (1.4, 3.1)	0.5 (0.3, 0.9)
Hispanic	28.9 (26.8, 31.0)	4.6 (3.9, 5.4)	1.6 (1.3, 2.0)
Other non-Hispanic ^a	30.5 (27.7, 33.4)	4.5 (3.5, 5.9)	1.2 (0.8, 1.8)
Ever used conventional tobacco products^b			
Yes	43.3 (40.5, 46.2)	16.5 (14.9, 18.3)	5.4 (4.7, 6.2)
No	26.9 (25.7, 28.2)	0.0 (0.0, 0.1)	— ^c
Currently use conventional tobacco products^b			
Yes	51.7 (48.3, 55.1)	26.2 (23.9, 28.7)	11.9 (10.4, 13.6)
No	28.9 (27.5, 30.3)	1.8 (1.5, 2.1)	0.1 (0.0, 0.1)
Ever smoked only conventional cigarettes^d			
Yes	29.1 (25.6, 32.9)	6.3 (4.9, 8.0)	0.5 (0.3, 1.0)
No	32.4 (30.9, 33.9)	5.2 (4.5, 6.0)	1.8 (1.5, 2.1)
Currently smoke only conventional cigarettes^d			
Yes	43.2 (37.1, 49.6)	14.0 (10.9, 17.9)	3.7 (2.3, 6.0)
No	31.9 (30.4, 33.4)	5.0 (4.3, 5.8)	1.7 (1.4, 2.0)
Ever used other non-conventional tobacco products^e			
Yes	57.1 (53.8, 60.3)	26.4 (23.8, 29.3)	10.0 (8.7, 11.5)
No	28.1 (26.8, 29.6)	2.1 (1.7, 2.5)	0.5 (0.4, 0.7)
Currently use other non-conventional tobacco products^e			
Yes	58.6 (54.8, 62.4)	28.8 (25.3, 32.7)	16.6 (14.1, 19.5)
No	30.5 (28.9, 32.1)	3.8 (3.2, 4.4)	0.9 (0.7, 1.1)
MIDDLE SCHOOL	26.3 (24.7, 28.0)	2.1 (1.7, 2.6)	0.8 (0.6, 1.0)
Sex			
Female	23.6 (21.9, 25.4)	1.7 (1.2, 2.4)	0.6 (0.4, 0.9)
Male	29.0 (26.9, 31.2)	2.5 (1.9, 3.1)	1.0 (0.7, 1.4)
Race/ethnicity			
White, non-Hispanic	29.9 (28.1, 31.7)	2.2 (1.7, 2.9)	0.7 (0.5, 1.1)
Black, non-Hispanic	15.8 (13.4, 18.6)	— ^c	— ^c
Hispanic	24.4 (21.4, 27.6)	2.2 (1.7, 3.0)	1.1 (0.7, 1.7)
Other non-Hispanic ^a	28.3 (24.4, 32.7)	2.3 (1.4, 3.7)	— ^c

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Table 4. Prevalence of awareness, ever use, and current use of snus, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI) (continued)

Characteristics	Awareness	Ever use	Current use
Ever used conventional tobacco products^b			
Yes	38.1 (34.6, 41.8)	12.4 (10.7, 14.3)	4.5 (3.6, 5.6)
No	24.2 (22.6, 25.9)	— ^c	— ^c
Currently use conventional tobacco products^b			
Yes	43.2 (38.7, 47.7)	21.7 (18.5, 25.4)	12.9 (10.4, 16.0)
No	25.3 (23.6, 27.2)	0.9 (0.7, 1.3)	0.1 (0.0, 0.1)
Ever smoked only conventional cigarettes^d			
Yes	31.3 (23.8, 40.0)	5.6 (3.4, 9.3)	— ^c
No	26.2 (24.6, 27.8)	1.9 (1.5, 2.4)	0.7 (0.5, 0.9)
Currently smoke only conventional cigarettes^d			
Yes	42.5 (30.1, 56.0)	— ^c	— ^c
No	26.2 (24.5, 27.9)	1.9 (1.5, 2.4)	0.7 (0.5, 0.9)
Ever used other non-conventional tobacco products^e			
Yes	52.4 (46.4, 58.2)	22.3 (18.0, 27.3)	9.4 (7.2, 12.2)
No	24.9 (23.3, 26.6)	1.0 (0.7, 1.3)	0.3 (0.2, 0.4)
Currently use other non-conventional tobacco products^e			
Yes	51.5 (42.5, 60.4)	21.5 (16.1, 28.2)	14.2 (9.7, 20.2)
No	25.9 (24.2, 27.6)	1.5 (1.2, 2.0)	0.4 (0.3, 0.6)
HIGH SCHOOL	36.5 (34.2, 38.9)	7.7 (6.7, 8.9)	2.5 (2.0, 3.0)
Sex			
Female	32.3 (30.1, 34.7)	4.2 (3.5, 5.0)	0.9 (0.7, 1.3)
Male	40.6 (37.7, 43.4)	11.2 (9.6, 13.0)	3.9 (3.2, 4.9)
Race/ethnicity			
White, non-Hispanic	44.3 (41.8, 46.7)	9.8 (8.3, 11.5)	3.4 (2.7, 4.2)
Black, non-Hispanic	15.4 (12.3, 19.0)	2.5 (1.6, 4.0)	0.6 (0.3, 1.2)
Hispanic	32.5 (29.9, 35.2)	6.4 (5.3, 7.8)	1.8 (1.3, 2.5)
Other non-Hispanic ^a	32.1 (28.1, 36.4)	6.3 (4.7, 8.4)	1.6 (1.1, 2.5)
Ever used conventional tobacco products^b			
Yes	44.8 (41.3, 48.3)	17.7 (15.6, 20.0)	5.6 (4.7, 6.7)
No	30.1 (28.1, 32.1)	— ^c	— ^c
Currently use conventional tobacco products^b			
Yes	53.4 (49.5, 57.2)	27.1 (24.2, 30.2)	11.6 (9.8, 13.6)
No	32.1 (30.0, 34.3)	2.6 (2.1, 3.1)	0.1 (0.0, 0.1)
Ever smoked only conventional cigarettes^d			
Yes	28.2 (23.7, 33.1)	6.6 (5.0, 8.6)	— ^c
No	37.3 (35.0, 39.6)	7.8 (6.7, 9.1)	2.6 (2.1, 3.2)

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Table 4. Prevalence of awareness, ever use, and current use of snus, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI) (continued)

Characteristics	Awareness	Ever use	Current use
Currently smoke only conventional cigarettes^d			
Yes	43.4 (36.8, 50.1)	14.9 (11.5, 19.2)	3.4 (1.9, 6.1)
No	36.4 (34.0, 38.8)	7.4 (6.4, 8.7)	2.4 (1.9, 3.0)
Ever used other non-conventional tobacco products^e			
Yes	58.0 (54.5, 61.4)	27.2 (24.1, 30.6)	9.9 (8.3, 11.8)
No	31.2 (28.9, 33.5)	3.1 (2.6, 3.7)	0.8 (0.6, 1.0)
Currently use other non-conventional tobacco products^e			
Yes	60.2 (55.9, 64.4)	30.3 (25.9, 35.1)	16.8 (13.7, 20.4)
No	34.3 (31.9, 36.8)	5.6 (4.8, 6.6)	1.3 (1.0, 1.6)

^aOther non-Hispanic race/ethnicity includes non-Hispanic Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and multi-race.

^bConventional tobacco products include cigarettes, cigars/cigarillos/little cigars, or smokeless tobacco. Ever use was defined as tried at least one conventional tobacco product one or more times. Current use was defined as used at least one conventional tobacco product on at least 1 of the past 30 days.

^cEstimate not shown because the relative SE was 40% or greater or denominator less than 50.

^dEver smoked only conventional cigarettes was defined as a response of yes to ever trying cigarette smoking, even one or two puffs, and never trying any other tobacco product (excluding snus). Current cigarette-only smoking was defined as having smoked cigarettes on at least 1 of the past 30 days and not using any other tobacco product (excluding snus).

^eOther non-conventional tobacco products include hookah, e-cigarettes, or dissolvables. Ever use was defined as tried at least one non-conventional product one or more times. Current use was defined as used at least one non-conventional tobacco product on 1 or more of the past 30 days.

except for Ariva and Stonewall (discontinued in December 2012), most dissolvables have only been test marketed in a few states since 2009.

Youth awareness and use of these non-conventional tobacco products could have been influenced by multiple factors, including tobacco industry marketing, peer influence, product appeal based on novelty and flavors, perceived social acceptability, perceptions about harm relative to conventional tobacco products, and lack of regulation for e-cigarettes and hookah.^{21,49,52,53} Longitudinal studies consistently suggest that exposure to tobacco advertising and promotion is associated with the likelihood that adolescents initiate smoking,⁵⁴ and there is a causal relationship between depictions of smoking in the movies and smoking initiation among youth.⁵⁵

In recent years, e-cigarette manufacturers have dedicated considerable resources to market the products in a variety of media, including magazines, Internet and manufacturers' websites, social networking and video-sharing sites, banner advertisements on Internet search engine sites, industry-supported online forums, and via TV advertisements that feature celebrity endorsements.^{19,20} The widespread marketing of e-cigarettes in recent years may have contributed, at least in part, to e-cigarette use among youth.

A primary public health concern with the increased diversity of tobacco products is the potential to increase the overall number of youth who initiate tobacco use by attracting those who may not have otherwise initiated tobacco use with a conventional tobacco product.

Consistent with patterns found in previous studies,^{22,44–46,56,57} across all four product types, awareness and use were highest among youth who also reported use of conventional tobacco products.

However, use of non-conventional products was also reported by up to one in five students who had not used conventional tobacco products. For these youth, use of non-conventional tobacco products may be their first exposure to tobacco, which puts them at risk for nicotine dependence and could lead to use of other tobacco products. Among students who reported use of both non-conventional and conventional tobacco products, it is important to understand how use of one type of product influences use of another, including transitions between products, as well as polytobacco use. Similarly, it is important to understand the implications of use of non-conventional products for nicotine dependence.

This study is subject to six limitations. First, given the cross-sectional design, it is not possible to evaluate trajectories of product use or examine the chronological sequence of youth tobacco use (i.e., transitions from conventional to non-conventional product use or the converse). Second, the NYTS does not gather data from students attending alternate, special education, vocational, or Department of Defense–operated schools or those who were not enrolled in school. Nonetheless, data from the Current Population Survey indicate that 98.5% of U.S. youth aged 10–13 years and 97.1% of those aged 14–17 years were enrolled in a traditional school in 2011.⁵⁸

Table 5. Prevalence of awareness, ever use, and current use of dissolvable tobacco products, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI)

	Awareness	Ever use	Current use
OVERALL	19.3 (18.1, 20.5)	2.0 (1.7, 2.4)	0.7 (0.6, 0.9)
Sex			
Female	18.6 (17.4, 19.8)	1.7 (1.4, 2.1)	0.5 (0.4, 0.7)
Male	19.9 (18.5, 21.5)	2.3 (1.9, 2.7)	0.9 (0.7, 1.2)
Race/ethnicity			
White, non-Hispanic	20.5 (19.3, 21.9)	1.9 (1.5, 2.3)	0.5 (0.4, 0.7)
Black, non-Hispanic	11.2 (9.7, 12.8)	1.2 (0.8, 2.0)	0.6 (0.3, 1.0)
Hispanic	20.5 (18.7, 22.3)	3.0 (2.3, 3.8)	1.3 (1.0, 1.8)
Other non-Hispanic ^a	20.9 (18.9, 23.0)	2.0 (1.4, 2.8)	0.7 (0.4, 1.2)
Ever used conventional tobacco products^b			
Yes	22.8 (20.9, 24.7)	6.3 (5.4, 7.2)	2.2 (1.8, 2.6)
No	17.6 (16.4, 18.9)	— ^c	0.0 (0.0, 0.1)
Currently use conventional tobacco products^b			
Yes	24.0 (21.3, 26.8)	8.7 (7.2, 10.4)	4.3 (3.5, 5.3)
No	18.4 (17.3, 19.7)	0.9 (0.7, 1.1)	0.1 (0.1, 0.2)
Ever smoked only conventional cigarettes^d			
Yes	18.6 (14.9, 22.9)	5.0 (3.6, 6.9)	— ^c
No	19.3 (18.1, 20.4)	1.8 (1.6, 2.2)	0.7 (0.6, 0.9)
Currently smoke only conventional cigarettes^d			
Yes	19.3 (14.5, 25.3)	5.0 (3.1, 7.9)	3.1 (1.7, 5.5)
No	19.3 (18.1, 20.5)	1.9 (1.6, 2.2)	0.6 (0.5, 0.8)
Ever used other non-conventional tobacco products^e			
Yes	29.5 (27.0, 32.1)	9.8 (8.3, 11.5)	3.9 (3.3, 4.7)
No	17.4 (16.2, 18.6)	0.7 (0.6, 0.9)	0.2 (0.1, 0.3)
Currently use other non-conventional tobacco products^e			
Yes	31.1 (27.2, 35.3)	12.7 (10.0, 16.1)	7.0 (5.5, 8.8)
No	18.4 (17.3, 19.6)	1.3 (1.1, 1.5)	0.3 (0.2, 0.5)
MIDDLE SCHOOL	18.2 (16.4, 20.2)	1.4 (1.1, 1.8)	0.5 (0.4, 0.8)
Sex			
Female	18.0 (16.5, 19.7)	1.4 (1.0, 1.9)	0.4 (0.2, 0.6)
Male	18.4 (16.0, 21.1)	1.5 (1.1, 2.0)	0.7 (0.4, 1.1)
Race/ethnicity			
White, non-Hispanic	19.4 (17.8, 21.1)	1.0 (0.7, 1.4)	0.4 (0.2, 0.7)
Black, non-Hispanic	11.7 (9.5, 14.4)	— ^c	— ^c
Hispanic	18.6 (15.8, 21.7)	2.3 (1.6, 3.3)	1.0 (0.6, 1.6)
Other non-Hispanic ^a	19.6 (16.3, 23.5)	1.5 (0.8, 2.8)	— ^c

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Table 5. Prevalence of awareness, ever use, and current use of dissolvable tobacco products, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI) (continued)

	Awareness	Ever use	Current use
Ever used conventional tobacco products^b			
Yes	27.2 (23.5, 31.3)	8.6 (7.0, 10.6)	3.0 (2.1, 4.4)
No	16.5 (14.7, 18.5)	— ^c	— ^c
Currently use conventional tobacco products^b			
Yes	29.5 (23.7, 36.2)	14.7 (10.9, 19.6)	8.4 (5.5, 12.4)
No	17.4 (15.6, 19.4)	0.7 (0.4, 1.0)	— ^c
Ever smoked only conventional cigarettes^d			
Yes	22.3 (13.6, 34.3)	6.6 (3.6, 11.6)	— ^c
No	18.0 (16.3, 19.8)	1.2 (0.9, 1.6)	0.5 (0.3, 0.7)
Currently smoke only conventional cigarettes^d			
Yes	27.1 (14.8, 44.3)	— ^c	— ^c
No	18.1 (16.3, 20.1)	1.3 (1.0, 1.6)	0.4 (0.3, 0.6)
Ever used other non-conventional tobacco products^e			
Yes	39.8 (34.4, 45.6)	15.0 (11.3, 19.7)	6.3 (4.4, 9.0)
No	16.8 (15.0, 18.8)	0.6 (0.5, 0.9)	0.2 (0.1, 0.4)
Currently use other non-conventional tobacco products^e			
Yes	39.7 (29.7, 50.6)	19.7 (13.4, 28.0)	11.3 (7.3, 17.0)
No	17.6 (16.0, 19.4)	0.9 (0.7, 1.2)	0.3 (0.2, 0.4)
HIGH SCHOOL	20.0 (18.8, 21.4)	2.5 (2.0, 3.0)	0.8 (0.6, 1.0)
Sex			
Female	18.9 (17.5, 20.4)	2.0 (1.5, 2.6)	0.6 (0.4, 0.9)
Male	21.1 (19.4, 23.0)	2.9 (2.4, 3.6)	1.0 (0.8, 1.4)
Race/ethnicity			
White, non-Hispanic	21.4 (19.7, 23.1)	2.5 (2.0, 3.2)	0.6 (0.5, 0.9)
Black, non-Hispanic	10.7 (8.6, 13.2)	1.0 (0.6, 1.6)	0.7 (0.4, 1.3)
Hispanic	21.9 (20.2, 23.8)	3.4 (2.5, 4.5)	1.4 (1.0, 2.1)
Other non-Hispanic ^a	21.8 (19.4, 24.4)	2.2 (1.5, 3.3)	0.7 (0.4, 1.4)
Ever used conventional tobacco products^b			
Yes	21.5 (19.6, 23.4)	5.5 (4.6, 6.6)	1.8 (1.5, 2.3)
No	18.9 (17.7, 20.3)	— ^c	— ^c
Currently use conventional tobacco products^b			
Yes	22.7 (20.1, 25.6)	7.3 (5.9, 9.0)	3.3 (2.6, 4.2)
No	19.3 (18.1, 20.6)	1.1 (0.9, 1.4)	0.2 (0.1, 0.3)
Ever smoked only conventional cigarettes^d			
Yes	16.9 (13.5, 20.9)	4.3 (2.9, 6.3)	— ^c
No	20.2 (18.9, 21.6)	2.3 (1.9, 2.9)	0.8 (0.7, 1.1)

(continued on next page)

Table 5. Prevalence of awareness, ever use, and current use of dissolvable tobacco products, U.S. students, 2012 National Youth Tobacco Survey, % (95% CI) (continued)

	Awareness	Ever use	Current use
Currently smoke only conventional cigarettes^d			
Yes	17.6 (12.8, 23.7)	4.2 (2.4, 7.2)	1.9 (0.9, 3.9)
No	20.1 (18.8, 21.5)	2.4 (1.9, 2.9)	0.7 (0.6, 1.0)
Ever used other non-conventional tobacco products^e			
Yes	27.3 (24.8, 29.9)	8.5 (7.0, 10.4)	3.2 (2.6, 4.0)
No	17.9 (16.6, 19.2)	0.8 (0.7, 1.0)	0.2 (0.1, 0.4)
Currently use other non-conventional tobacco products^e			
Yes	28.8 (25.3, 32.6)	10.8 (8.4, 13.8)	5.6 (4.1, 7.4)
No	19.1 (17.8, 20.4)	1.6 (1.3, 2.0)	0.4 (0.2, 0.6)

^aOther non-Hispanic race/ethnicity includes non-Hispanic Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and multi-race.

^bConventional tobacco products include cigarettes, cigars/cigarillos/little cigars, or smokeless tobacco. Ever use was defined as tried at least one conventional tobacco product one or more times. Current use was defined as used at least one conventional tobacco product on at least 1 of the past 30 days.

^cEstimate not shown because the relative SE was 40% or greater or denominator less than 50.

^dEver smoked only conventional cigarettes was defined as a response of yes to ever trying cigarette smoking, even one or two puffs, and never trying any other tobacco product (excluding dissolvables). Current cigarette-only smoking was defined as having smoked cigarettes on at least 1 of the past 30 days and not using any other tobacco product (excluding dissolvables).

^eOther non-conventional tobacco products include hookah, snus, or e-cigarettes. Ever use was defined as tried at least one non-conventional product one or more times. Current use was defined as used at least one non-conventional tobacco product on 1 or more of the past 30 days.

Third, tobacco use was self-reported, which could introduce reporting bias. Although studies have confirmed the validity of self-reported smoking,⁵⁹ the validity of self-reported use of non-conventional tobacco products is unknown. Fourth, the estimates are based on bivariate analyses; observed differences may be driven by demographic or tobacco use characteristics that were not adjusted for. Fifth, sample sizes for certain subpopulations of tobacco users were relatively small, resulting in imprecise estimates that were not reported.

Finally, the categories used to differentiate between products in this analysis (i.e., conventional and non-conventional tobacco products) do not necessarily account for other meaningful differences that exist between products grouped in the same category, including whether they are combusted (e.g., hookah) or non-combusted (e.g., dissolvables).

Conclusions

Millions of U.S. middle and high school students are aware of and use non-conventional tobacco products, including e-cigarettes and hookah. Use of non-conventional tobacco products is especially high among those who use conventional tobacco products, causing concern about polytobacco use. Moreover, use of non-conventional tobacco products among students who do not use conventional tobacco products raises serious concerns about risks for initiating tobacco use and potential nicotine dependence.

Implementing evidence-based interventions can reduce tobacco use among youth.^{56,60}

These findings indicate that full implementation of comprehensive tobacco control programs at CDC-recommended funding levels is warranted to reduce all forms of tobacco use among U.S. youth.⁶⁰ In addition, these findings underscore the importance of continued tobacco product surveillance in conjunction with efforts to reduce and prevent all tobacco use, as well as research to understand how non-conventional product use relates to initiation, cessation, and concurrent use of conventional tobacco products among youth.

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