

Frequency of Tobacco Use Among Middle and High School Students — United States, 2014

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The use of tobacco products during adolescence increases the risk for adverse health effects and lifelong nicotine addiction (1,2). In 2014, an estimated 4.6 million middle and high school students were current users of any tobacco product, of whom an estimated 2.2 million were current users of two or more types of tobacco products (3). Symptoms of nicotine dependence are increased for multiple tobacco product users compared with single-product users (4,5). CDC and the Food and Drug Administration (FDA) analyzed data from the 2014 National Youth Tobacco Survey (NYTS) to determine how frequently (the number of days in the preceding 30 days) U.S. middle school (grades 6–8) and high school (grades 9–12) students used cigarettes, e-cigarettes, cigars, and smokeless tobacco products. Among current users (≥ 1 day during the preceding 30 days) in high school, frequent use (≥ 20 days during the preceding 30 days) was most prevalent among smokeless tobacco users (42.0%), followed by cigarette smokers (31.6%), e-cigarette users (15.5%), and cigar smokers (13.1%); a similar pattern was observed for those who used during all 30 days. Among current users in middle school, frequent use was greatest among smokeless tobacco users (29.2%), followed by cigarette smokers (20.0%), cigar smokers (13.2%) and e-cigarette users (11.8%). Current use of two or more types of tobacco products was common, even among students who used tobacco products 1–5 days during the preceding 30 days: 77.3% for cigar smokers, 76.9% for cigarette smokers, 63.4% for smokeless tobacco users, and 54.8% for e-cigarettes users. Preventing youths from initiating the use of any tobacco product is important to tobacco use prevention and control strategies in the United States (1,2). Monitoring the frequency and patterns of tobacco use among youths, including the use of two or more tobacco products, is important to inform

evidence-based interventions to prevent and reduce all forms of tobacco use among youths (2).

NYTS is a cross-sectional, school-based, pencil-and-paper questionnaire administered to U.S. middle school and high school students. Information is collected to monitor the impact of comprehensive tobacco control policies and strategies and to inform FDA's regulatory actions (6). A three-stage cluster sampling procedure was used to generate a nationally representative sample of U.S. students in grades 6–12 who attend public and private schools. Of the 258 schools

INSIDE

- 1066 Flavored Tobacco Product Use Among Middle and High School Students — United States, 2014
- 1071 Q Fever Outbreak Among Travelers to Germany Who Received Live Cell Therapy — United States and Canada, 2014
- 1074 Estimated Lifetime Medical and Work-Loss Costs of Fatal Injuries — United States, 2013
- 1078 Estimated Lifetime Medical and Work-Loss Costs of Emergency Department–Treated Nonfatal Injuries — United States, 2013
- 1083 Ebola Virus Disease in Health Care Workers — Guinea, 2014
- 1088 Measles Outbreak Associated with Vaccine Failure in Adults — Federated States of Micronesia, February–August 2014
- 1094 QuickStats

Continuing Education examination available at http://www.cdc.gov/mmwr/cme/conted_info.html#weekly.



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selected for the 2014 NYTS, 207 (80.2%) participated, with a sample of 22,007 (91.4%) among 24,084 eligible students; the overall response rate was 73.3%. Current use (use ≥ 1 day during the preceding 30 days) was assessed for nine products: cigarettes, cigars (defined as cigars, cigarillos, or little cigars), smokeless tobacco (defined as chewing tobacco, snuff, or dip), e-cigarettes, hookahs, tobacco pipes, snus, dissolvable tobacco (dissolvables), and bidis. Frequency of use (number of days during the preceding 30 days) was asked exclusively for four products: cigarettes, cigars, smokeless tobacco, and e-cigarettes; response options were 0 days, 1–2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, and all 30 days. Estimates of multiple tobacco product use were determined by assessing preceding 30-day use of only one other tobacco product or the use of two or more other tobacco products among current cigarette, e-cigarette, cigar, and smokeless tobacco users. Data were weighted to account for the complex survey design and to adjust for nonresponse. National prevalence estimates were computed with 95% confidence intervals and population estimates rounded down to the nearest 10,000.

In 2014, among middle and high school students who used at least one of these four products, an estimated 480,000 middle school and high school students smoked cigarettes, 390,000 used smokeless tobacco, 340,000 used e-cigarettes, and 170,000 smoked cigars on ≥ 20 of the preceding 30 days (Table). Among high school students who were current users, 42.0% of smokeless tobacco users, 31.6% of cigarette smokers, 15.5% of e-cigarettes users, and 13.1% of cigar smokers

reported using the product during ≥ 20 of the preceding 30 days (Table); the proportion who used the product during 1–2 of the preceding 30 days was 52.0% for cigar smokers, 45.4% for e-cigarette users, 37.0% for cigarette smokers, and 26.6% for smokeless tobacco users. Among middle school students who were current users, 29.2% of smokeless tobacco users, 20.0% of cigarette smokers, 13.2% of cigar smokers, and 11.8% of e-cigarette users used the product on ≥ 20 of the preceding 30 days; the proportion who used the product during 1–2 of the preceding 30 days was 54.5% for e-cigarette users, 44.3% for cigar smokers, 43.2% for cigarette smokers, and 38.4% for smokeless tobacco users.

Among middle school and high school students who reported using cigarettes, e-cigarettes, cigars, or smokeless tobacco on 1–5 days during the preceding 30 days, the percentages using multiple tobacco products were 77.3% for cigar smokers, 76.9% for cigarette smokers, 63.4% for smokeless tobacco users, and 54.8% for e-cigarette users (Figure).

Discussion

In 2014, among middle and high school students who used at least one of these four products, an estimated 480,000 middle school and high school students smoked cigarettes, 390,000 used smokeless tobacco, 340,000 used e-cigarettes, and 170,000 smoked cigars on ≥ 20 of the preceding 30 days. The frequency of tobacco use among current users varied by school level and by type of tobacco product. High school students were more frequent users of tobacco products than

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TABLE. Frequency of current use of cigarettes, e-cigarettes, cigars, and smokeless tobacco among middle and high school students,* by number of days of use during the preceding 30 days — National Youth Tobacco Survey, United States, 2014

Days of use	Tobacco product											
	Cigarettes			E-cigarettes			Cigars			Smokeless tobacco		
	%	(95% CI)	Estimated no. of users [†]	%	(95% CI)	Estimated no. of users [†]	%	(95% CI)	Estimated no. of users [†]	%	(95% CI)	Estimated no. of users [†]
High school												
1–2 days	37.0	(34.0–40.0)	500,000	45.4	(41.9–49.0)	910,000	52.0	(46.9–57.0)	620,000	26.6	(23.0–30.6)	220,000
3–5 days	12.3	(10.1–14.9)	160,000	16.2	(14.0–18.5)	320,000	18.7	(16.0–21.8)	220,000	11.1	(8.3–14.6)	90,000
6–9 days	9.7	(7.5–12.5)	130,000	12.0	(10.0–14.3)	240,000	7.5	(5.7–9.8)	90,000	8.2	(5.7–11.6)	60,000
10–19 days	9.4	(7.4–11.9)	120,000	10.9	(9.1–13.0)	220,000	8.8	(6.6–11.6)	100,000	12.2	(8.9–16.6)	100,000
20–29 days	9.0	(7.1–11.4)	120,000	5.8	(4.5–7.5)	110,000	4.6	(3.3–6.3)	50,000	11.2	(8.4–14.7)	90,000
All 30 days	22.6	(19.2–26.5)	310,000	9.7	(7.5–12.5)	190,000	8.5	(6.6–10.8)	100,000	30.8	(26.5–35.4)	250,000
Middle school												
1–2 days	43.2	(32.4–54.7)	120,000	54.5	(49.5–59.3)	240,000	44.3	(36.2–52.7)	90,000	38.4	(23.6–55.6)	70,000
3–5 days	17.9	(12.1–25.8)	50,000	17.3	(13.7–21.6)	70,000	14.3	(9.6–20.8)	30,000	13.2	(8.0–21.1)	20,000
6–9 days	10.1	(6.3–15.7)	20,000	9.2	(7.0–12.0)	40,000	15.0	(9.2–23.4)	30,000	13.0	(7.8–20.9)	20,000
10–19 days	8.7	(5.7–13.2)	20,000	7.3	(5.2–10.1)	30,000	13.2	(7.4–22.5)	20,000	6.2 [§]	(2.8–12.8)	10,000
20–29 days	5.8 [§]	(2.9–11.2)	10,000	3.9 [§]	(2.1–7.3)	10,000	3.3 [§]	(1.5–6.9)	<10,000	11.3 [§]	(4.1–27.6)	20,000
All 30 days	14.2	(9.0–21.8)	40,000	7.9	(5.4–11.4)	30,000	9.9	(6.2–15.6)	20,000	17.9	(11.1–27.7)	30,000

Abbreviation: CI = confidence interval.

* Frequency of current use of cigarettes, e-cigarettes, cigars (defined as cigars, cigarillos, or little cigars), and smokeless tobacco (defined as chewing tobacco, snuff, or dip) was determined by asking participants on how many days they used each of these tobacco products during the preceding 30 days.

[†] Estimated number of users was rounded down to the nearest 10,000.

[§] Data are statistically unreliable because the sample size was <50 or the relative standard error was >30%.

middle school students, which is consistent with trajectories of initiation and escalation of use during adolescence; for example, the average age of first use of cigarettes is 15 years, and the average age of beginning daily cigarette use is 18 years (1). Studies have shown that early age of onset of cigarette smoking increases the risk for heavier use, long-term use, and greater difficulty quitting (4,7). The impacts of early initiation also might hold true for users of other tobacco products, given that exposure to nicotine is the main cause of tobacco product dependence (1). Studies have documented that even among U.S. adolescent tobacco users who only used a single tobacco product on 1–2 days during the previous month, many reported symptoms of tobacco dependence, including strong cravings (14%), irritability and restlessness when not using tobacco (11%), strong desire to use the product (6%), and wanting to use the tobacco product within 30 minutes of awakening (1%) (5).

This report highlights the importance of understanding not only frequency of tobacco product use, but also patterns of using multiple products. A high level of multiple tobacco product use was observed, even among students using e-cigarettes, cigarettes, cigars or smokeless tobacco on 1–5 of the preceding 30 days. The prevalence of reporting symptoms of dependence is 2–3 times higher for multiple product users than for single-product users (4,5). The use of multiple tobacco products among adolescents increases exposure (inhalation or oral absorption) to nicotine and other harmful by-products contained in these tobacco products (2).

Summary

What is already known on this topic?

The use of tobacco products during adolescence increases the risk for adverse health effects and lifelong nicotine addiction. Symptoms of nicotine dependence are increased for multiple tobacco product users compared with single-product users.

What is added by this report?

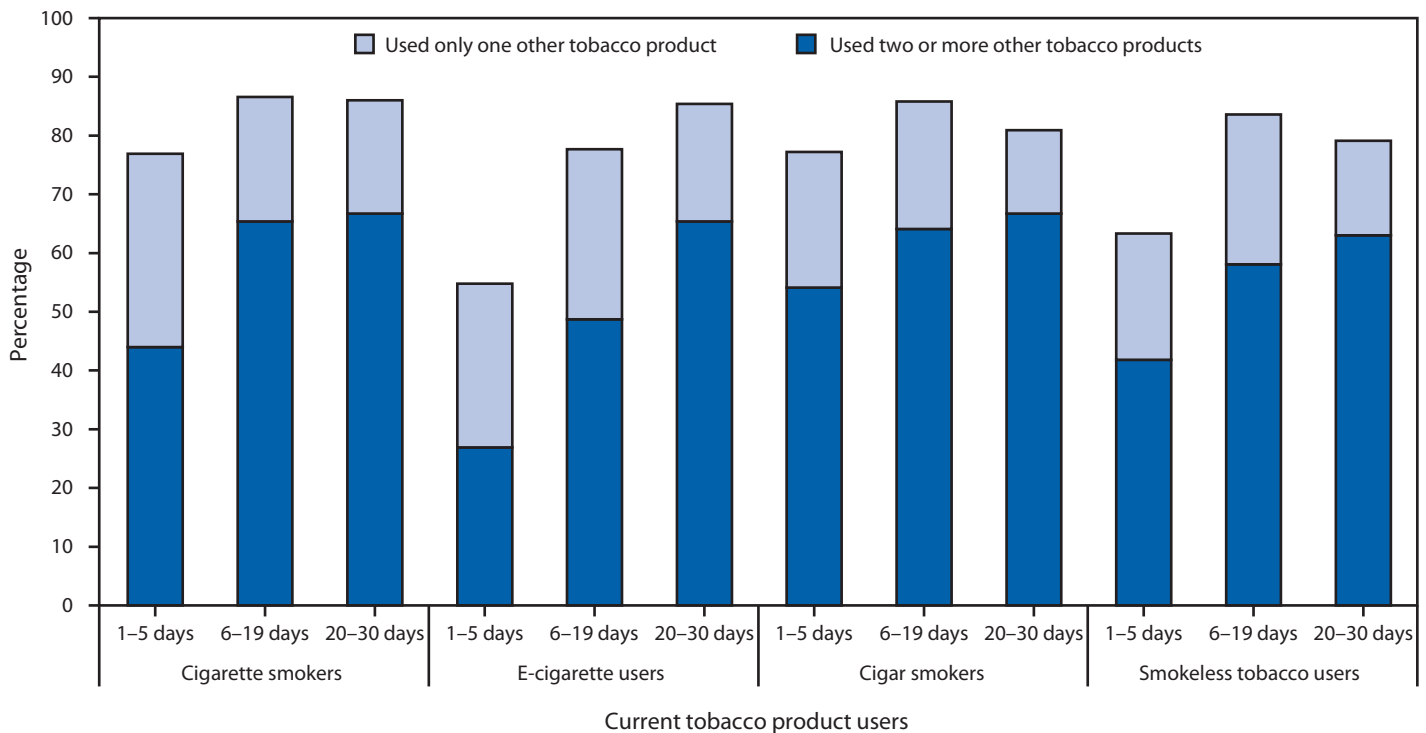
In 2014, among high school students who were current users of each respective product, 42.0% of smokeless tobacco users, 31.6% of cigarette smokers, 15.5% of e-cigarettes users, and 13.1% of cigar smokers used the product on ≥20 of the preceding 30 days. Among middle and high school students who reported using cigarettes, e-cigarettes, cigars, or smokeless tobacco on 1–5 days during the preceding 30 days, the percentages using multiple tobacco products were 77.3% for cigar smokers, 76.9% for cigarette smokers, 63.4% for smokeless tobacco users, and 54.8% for e-cigarette users.

What are the implications for public health practice?

Use of tobacco in any form by youths is unsafe. Greater understanding of the types of tobacco products and patterns of use of these products among youths is important to sustaining proven tobacco prevention and control strategies, including increasing tobacco product prices, adopting comprehensive smoke-free laws, and implementing public education media campaigns.

The findings in this report are subject to at least four limitations. First, all the data were self-reported and might be subject to recall bias or social desirability bias. Second, the data were

FIGURE. Percentage of middle and high school students who reported using more than one type of tobacco product,* by number of days used during the preceding 30 days, among current cigarette smokers, e-cigarette users, cigar smokers, and smokeless tobacco users† — National Youth Tobacco Survey, United States, 2014



* Current use was assessed for nine types of tobacco products: cigarettes; cigars (defined as cigars, cigarillos, or little cigars); smokeless tobacco (defined as chewing tobacco, snuff, or dip); e-cigarettes; hookahs; tobacco pipes; snus; dissolvable tobacco (dissolvables); and bidis. Current use for each product type was defined as use on ≥ 1 days during the preceding 30 days.

† Use of one or two or more of the other eight types of tobacco products was assessed among current cigarette smokers, e-cigarette users, cigar smokers, and smokeless tobacco users.

collected from students who attended either public or private schools, and might not be generalizable to all U.S. middle and high school-aged youths. Third, frequency of use was estimated by the number of days the respondent reported using the tobacco product during the preceding 30 days; however, the pattern of use, primary product used, or which products were used on specific days, could not be obtained from these data. Therefore, the extent to which products were used together on the same days could not be determined. Finally, frequency of use of hookahs, tobacco pipes, snus, dissolvables, and bidis was not collected; therefore, the frequency of use of these tobacco products could not be assessed.

Preventing youths from beginning use of any tobacco product is important to tobacco use prevention and control strategies in the United States (2). Most adult cigarette smokers start smoking before age 18 years, and nearly all transition from occasional to daily smoking occurs before age 26 years (1,2). Use of tobacco in any form by youths is unsafe (1). Therefore, the increased use of emerging tobacco products, such as e-cigarettes and hookahs, and the use of multiple types

of tobacco products, is a public health concern. Greater understanding of the types of tobacco products and patterns of use of these products among youths is important for ensuring that proven tobacco prevention and control strategies, including increasing tobacco product prices, adopting comprehensive smoke-free laws, and implementing public education media campaigns, address the diverse types of tobacco products used by youth (8–10).

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