

CORRESPONDENCE

Adolescent Vaping and Nicotine Use in 2017–2018 — U.S. National Estimates

TO THE EDITOR: A rapid increase in the prevalence of vaping among adolescents has aroused public health concern. Adolescents who “vape” use a device such as an electronic cigarette to inhale a heated aerosol, which typically contains nicotine. In 2017, vaping was the most common use of any tobacco-like product among adolescents.¹ This is a rapid rise from a near-zero prevalence of vaping in 2011.² We assessed whether the prevalence of nicotine vaping increased among adolescents from 2017 to 2018.

Data for our study came from Monitoring the Future,¹ which annually surveys nationally representative, independent samples of students in the 12th, 10th, and 8th grades. Analyses were based

on a total of 13,850 respondents. A randomly selected half of the 12th-grade respondents in this study answered a group of questions on vaping as well as on six common forms of tobacco use, which allowed for the assessment of overall nicotine use with any nicotine product. (For all survey measures and question wording, see the Supplementary Appendix, available with the full text of this letter at NEJM.org.)

There was a sharp increase in the prevalence of nicotine vaping — 10.0 percentage points among 12th-graders, 7.9 percentage points among 10th-graders, and 2.6 percentage points among 8th-graders (Table 1). The increases were similar in the combination measure of adolescents who

Table 1. Prevalence of Vaping in the Past 30 Days, According to Substance, School Grade, and Year.*

Substance and School Grade	Prevalence in 2017 (95% CI)	Prevalence in 2018 (95% CI)	Change from 2017 to 2018 (95% CI)
	percent		percentage points
Vaped nicotine			
12th grade	11.0 (9.2–13.0)	20.9 (17.7–24.6)	10.0 (6.5–13.4)
10th grade	8.2 (6.6–10.2)	16.1 (14.0–18.6)	7.9 (5.6–10.2)
8th grade	3.5 (2.9–4.2)	6.1 (5.1–7.4)	2.6 (1.4–3.8)
Vaped flavoring			
12th grade	9.7 (8.4–11.0)	13.5 (11.8–15.4)	3.8 (1.8–5.9)
10th grade	9.2 (7.7–10.8)	13.1 (11.5–15.0)	3.9 (1.8–6.1)
8th grade	5.3 (4.5–6.3)	8.1 (6.8–9.6)	2.8 (1.2–4.3)
Vaped nicotine or flavoring†			
12th grade	15.2 (13.3–17.4)	25.0 (21.6–28.7)	9.8 (6.1–13.4)
10th grade	12.0 (10.2–14.1)	20.3 (17.9–22.9)	8.3 (5.6–11.0)
8th grade	6.3 (5.4–7.3)	9.7 (8.2–11.4)	3.4 (1.7–5.1)

* Because of rounding, the estimates of absolute difference may differ slightly from the differences between the annual estimates. The 95% confidence intervals (CIs) have not been adjusted for multiple comparisons, and inferences drawn from these intervals may therefore not be reproducible. The unweighted sample sizes varied slightly according to outcome: among 12th-graders, the range is from 4063 to 4271 survey respondents; among 10th-graders, from 4420 to 4696; and among 8th-graders, from 4473 to 4883.

† The estimates of vaping nicotine or flavoring can serve as an upper boundary for estimates of nicotine vaping. These estimates would be the nicotine-vaping prevalence levels under the assumption that all youths who vaped “just flavoring” were unknowingly vaping nicotine.

reported vaping nicotine or “just flavoring” (or both) — a measure that captures data regarding youths who may unknowingly vape nicotine.

The overall use of nicotine with any product increased significantly, by 5.2 percentage points from 23.7% to 28.9%, in the sample of 12th-graders who answered questions on both vaping and use of tobacco products. This increase was driven solely by nicotine vaping, given that the use of each of the other six nicotine products declined (although not significantly).

The 1-year increases in the prevalence of nicotine vaping translate into approximately 1.3 million additional adolescents who vaped in 2018, as compared with 2017. This estimate was calculated on the basis of approximately 16 million youths³ in grades 9 through 12, with interpolation of the increases in grades 9 and 11 as the mean of the increases in the adjacent grades. Put in historical context, the absolute increases in the prevalence of nicotine vaping among 12th-graders and 10th-graders are the largest ever recorded by Monitoring the Future in the 44 years that it has continuously tracked dozens of substances.

These results indicate that the policies in place as of the 2017–2018 school year were not sufficient to stop the spread of nicotine vaping among adolescents. The rapid entry of new vaping devices on the market, the latest example of which is the Juul,⁴ will require continual updates and modification of strategies to keep adolescents from vaping and its associated negative health effects.⁵

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