

Daily e-cigarette use rising despite slight decline in current use among youngest adults

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While overall current electronic cigarette use (meaning use within the past 30 days) fell slightly in 2020 from previous years, daily e-cigarette use has been steadily increasing among U.S. adults, according to new

research supported by the American Heart Association's Tobacco Center of Regulatory Science and published today in *JAMA Network Open*.

"This analysis reflects self-reported e-cigarette use among adults in the U.S. between 2017 and 2020 and we were glad to see a modest decline in overall e-cigarette use during this time. That was driven mostly by a decline in the current use of e-cigarettes, meaning use within the past 30 days, among our youngest adults, those aged 18 to 20 years," said senior study author Michael J. Blaha, M.D., M.P.H., director of clinical research at Johns Hopkins Ciccarone Center for Prevention of Cardiovascular Disease in Baltimore. "However, it was alarming to see that, overall, there was an increase in daily e-cigarette use among adults, with the largest increase among those aged 21 to 24 years."

The study authors used data from the 2017 to 2020 Behavioral Risk Factor Surveillance System to study e-cigarette use among more than 429,000 U.S. adults in 2017; more than 280,000 adults in 2018; and nearly 285,000 adults in 2020. Among the things they examined: national estimates of current use of e-cigarettes (meaning use within the past 30 days) and daily e-cigarette use, current (past-30-day) e-cigarette use for each state or territory and state-level trends between 2017 and 2020.

The researchers found:

- There was a modest decline in current e-cigarette use (meaning use within the past 30 days) among U.S. adults from 5.5% in 2018 to 5.1% in 2020. The decrease was mainly driven by declines among young adults aged 18 to 20 years in current e-cigarette use, which the authors noted is the group impacted by the Tobacco-21 legislation, which raises the minimum age for e-cigarette sales from 18 to 21 years. The American Heart Association strongly supported this legislation.

- The decline in past-30-day e-cigarette use between 2018 and 2020 was not similar across all states. Some states recorded significant declines in past 30-day e-cigarette use. For example, in Connecticut past 30-day e-cigarette use went from 5.6% to 4.5%. Past 30-day e-cigarette use also fell in Massachusetts, New York and North Dakota. But other states and territories recorded increases in e-cigarette use, including an alarming increase in Guam, where past 30-day e-cigarette use went from 5.9% to 11.4%. Utah, Kansas and Tennessee also had higher increases in e-cigarette use in the past 30 days.
- Of public health concern, daily e-cigarette use, which represents a transition to more nicotine dependence, has steadily increased. Among current e-cigarette users, the proportion who reported daily use increased notably from 34.5% in 2017 to 44.4% in 2020. The authors pointed out that between 2018 and 2020, the prevalence of daily e-cigarette use among young adults aged 21 to 24 years increased from 4.4% to 6.6%.

"Evidence on the long-term cardiovascular effects of using only e-cigarettes is limited, but acute exposure studies have shown e-cigarettes to have harmful effects on the cardiovascular system, including increased [heart rate](#) and blood pressure. More importantly, the use of e-cigarettes along with combustible cigarettes represents a problematic use pattern with an increased risk of cardiovascular and lung disease," said Blaha, who is the principal investigator of the Cardiovascular Effects of Tobacco Products in Community-based Cohorts project funded by the American Heart Association's Tobacco Center of Regulatory Science through federal grants. "Prior studies have found dual-use of these products to be associated with worse tobacco-related health consequences compared with non-use and sole combustible cigarette use."

Blaha noted that it's crucial to monitor how the patterns of e-cigarette

use are changing among different population subgroups, including youth, tobacco naïve people and people who use combustible cigarettes, to determine the effectiveness of regulations and initiatives aimed at improving [public health](#) by reducing the use of all nicotine products, including e-cigarettes as well as combustible cigarettes.

"Recent studies have shown that e-cigarette use among youth has decreased. That, coupled with the finding from this study of a modest decline in current use among young adults aged 18 to 20 years, might be an early indication that recently implemented federal and state policies, including the Tobacco-21 legislation and e-cigarette flavor restrictions, could be having an effect," said study co-author Ellen Boakye, M.D., M.P.H., a research fellow at Johns Hopkins Ciccarone Center for Prevention of Cardiovascular Disease. "It's also possible that the extensive public education and increased public awareness that accompanied the 2019 e-cigarette or vaping product use-associated lung injury (EVALI) outbreak may have played a role."

The authors noted, however, that while some of these factors might have contributed to changes in e-cigarette use, this study did not determine if factors, such as legislation, actually had an impact.

Differences in e-cigarette use by state might also reflect differences in state-level policies and their implementation, according to Blaha.

"For instance, the significant reductions in e-cigarette use in Massachusetts and New York correlated with the reported declines in e-cigarette sales in these states following their state-wide restrictions on flavored e-cigarette sales," he said.

Boakye noted the rise in daily e-cigarette use is a concern because it could represent a transition from occasional or experimental e-cigarette use to more nicotine dependence, associated addiction and increased

health risk. Additionally, although current e-cigarette use among young adults aged 18 to 20 years has declined, a considerable proportion, 15.6%, still report using these devices.

"Therefore, there is a need for stricter enforcement of the Tobacco-21 legislation and measures that discourage the social sharing of e-cigarettes. Also, measures that make e-cigarettes less appealing to [young adults](#) are needed. Additionally, there is the need for continued surveillance of the patterns of e-cigarette use, particularly daily use, as this represents a concerning emerging pattern of use with a greater risk of nicotine addiction and subsequent combustible cigarette initiation," Blaha said.

Future studies that assess the factors that predict the transition from occasional to frequent or daily e-cigarette use are needed to help inform policies aimed at discouraging these transitions. The authors add that health care professionals should feel comfortable discussing e-cigarette use with patients to screen them for [e-cigarette](#) and other tobacco product use, educate patients and support efforts to quit.

A limitation of this work is that not all states provided information on [e-cigarette use](#) in 2018 and 2020, so estimates for those years may not be nationally representative.

More information: Ellen Boakye et al, Assessment of Patterns in e-Cigarette Use Among Adults in the US, 2017-2020, *JAMA Network Open* (2022). [DOI: 10.1001/jamanetworkopen.2022.23266](https://doi.org/10.1001/jamanetworkopen.2022.23266)

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