Changes from 2017 to 2018 in e-cigarette use and ever marijuana use in e-cigarettes according to smoking status and frequency of use among US adolescents: analysis of the 2017 and 2018 NYTS

Konstantinos Farsalinos, MD, MPH
Researcher
Onassis Cardiac Surgery Center, Greece
University of Patras, Greece
National School of Public Health, Greece
Manuscript to be submitted for publication

Coauthors

Anastasia Barbouni, MD, PhD\textsuperscript{1}, Raymond Niaura, PhD\textsuperscript{2}

\textsuperscript{1} National School of Public Health, Greece
\textsuperscript{2} College of Global Public Health, New York University.
Definitions

**Past 30d use:** any use in the past 30 days (even 1 puff)

**Infrequent use:** use for 1-19 of the past 30 days

**Frequent use:** use for 20-20 of the past 30 days (includes daily use)
Surgeon General Warns Youth Vaping Is Now An 'Epidemic'

Surgeon General's Advisory on E-cigarette Use Among Youth

I, Surgeon General of the United States Public Health Service, VADM Jerome Adams, am emphasizing the importance of protecting our children from a lifetime of nicotine addiction and associated health risks by immediately addressing the epidemic of youth e-cigarette use. The recent surge in e-cigarette use among youth, which has been fueled by new types of e-cigarettes that have recently entered the market, is a cause for great concern. We must take action now to protect the health of our nation's young people.

KNOW THE RISKS. TAKE ACTION. PROTECT OUR KIDS.

The E-cigarette Epidemic Among Youth

U.S. Surgeon General Dr. Jerome Adams said Tuesday that local restrictions, including bans on indoor vaping, are needed to reduce youth e-cigarette use. ERIC BARADAT/AFP/GETTY IMAGES
Smoking in youth in USA - 2017/2018

Smoking in middle school and high school students, USA
NYTS 2017/2018

- Never smoking: 82.0% (2017), 81.5% (2018)
- Past 30d smoking: 5.2% (2017), 5.2% (2018)
- Infrequent smoking: 4.0% (2017), 4.0% (2018)
- Frequent smoking: 1.1% (2017), 1.2% (2018)
E-cigarette use in youth (total population) 2017/2018

E-cigarette use in middle school and high school students, USA
NYTS 2017/2018

<table>
<thead>
<tr>
<th>Category</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never use</td>
<td>77.0%</td>
<td>72.4%</td>
</tr>
<tr>
<td>Past 30d use</td>
<td>7.9%</td>
<td>13.5%</td>
</tr>
<tr>
<td>Infrequent use</td>
<td>6.4%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Frequent use</td>
<td>1.5%</td>
<td>3.5%</td>
</tr>
</tbody>
</table>
E-cigarette use in youth (total population) 2017/2018

Past 30-d e-cigarette use frequency, middle school and high school, USA
NYTS 2017/2018

- 1-2 days: 3.3% (2017), 4.8% (2018)
- 3-5 days: 1.6% (2017), 2.1% (2018)
- 6-9 days: 0.7% (2017), 1.4% (2018)
- 10-19 days: 0.8% (2017), 1.7% (2018)
- 20-29 days: 0.5% (2017), 1.1% (2018)
- 30 days: 1.1% (2017), 2.4% (2018)
E-cigarette use in youth (never smokers)  2017/2018
E-cigarette use in youth (never smokers)  2017/2018

Past 30-d e-cigarette use among never-smoking adolescents  
NYTS 2017/2018

No past 30 days use
- 2017: 95.8%
- 2018: 91.4%

Infrequent use
- 2017: 3.1%
- 2018: 6.3%

Frequent use
- 2017: 0.3%
- 2018: 0.9%

Daily use
- 2017: 0.1%
- 2018: 0.5%
E-cigarette use in youth (never smokers) 2015

Past 30-d e-cigarette use among never smoking adolescents
NYTS 2015

- No past 30-day use: 94.5%
- 1-2 days: 2.7%
- 3-5 days: 0.8%
- 6-9 days: 0.5%
- 10-19 days: 0.3%
- 20-29 days: 0.1%
- 30 days: 0.2%
E-cigarette use in youth (never smokers) 2015/2018

Past 30-d e-cigarette use among never-smoking youth
NYTS 2015/2018

- No past 30-day use: 95% in 2015, 91.4% in 2018
- 1-2 days: 3% in 2015, 3.6% in 2018
- 3-5 days: 1% in 2015, 1.2% in 2018
- 6-9 days: 1% in 2015, 0.8% in 2018
- 10-19 days: 0% in 2015, 0.8% in 2018
- 20-29 days: 0% in 2015, 0.4% in 2018
- 30 days: 0% in 2015, 0.5% in 2018
Marijuana use in e-cigarettes

“Have you ever used marijuana, marijuana concentrates, marijuana waxes, THC, or hash oils in an e-cigarette?”

This was the ONLY question addressing marijuana use in e-cigarettes
Marijuana use in e-cigarettes in youth (never smokers) 2017/2018

Ever marijuana use in e-cigarettes, middle school and high school, USA NYTS 2017/2018

- Past 30d e-cigarette use: 50.3% (2017), 52.7% (2018)
- Infrequent e-cigarette use: 45.4% (2017), 46.8% (2018)
- Frequent e-cigarette use: 70.3% (2017), 69.4% (2018)
Marijuana use in e-cigarettes in never smokers 2017/2018

Ever marijuana use in e-cigarettes among never-smoking youth NYTS 2017/2018

- No past 30d e-cigarette use: 0%
- Infrequent e-cigarette use: 3.9% and 4.9%
- Frequent e-cigarette use: 28.1% and 35.4%
- Daily e-cigarette use: 69.0% and 54.7%

2017: 69.8%
2018: 60.1%
Association between e-cigarette use and smoking status, 2017/2018

Odds ratios (ORs) of being a past 30d e-cigarette user, NYTS 2018

Never smokers

Ever smokers

Past 30d smokers

Infrequent smokers

Frequent smokers
Conclusions

- Has e-cigarette use increased in 2018 compared to 2017?
  - Yes, in all groups, including never smokers
- Still, frequent and daily e-cigarette use among never smokers is rare
- Compared to never smokers, ever, past 30d and frequent smokers have 10 to 17-fold higher odds of being past 30d e-cigarette users.
- High prevalence of ever marijuana use with an e-cigarette
  - About 60% of never-smoking frequent and daily e-cigarette users have ever used marijuana with an e-cigarette
- No difference between 2017 and 2018 in marijuana use with an e-cigarette – the increase in e-cigarette use in 2018 is not attributed to marijuana use
- Questions
  - How many adolescents use e-cigarettes predominantly (or even exclusively) for marijuana use?
    - Unknown, CDC needs to improve the questionnaire design
    - Discussion about flavors may be irrelevant if many never smokers use e-cigarettes for marijuana
  - How does the availability of e-cigarettes affect the prevalence of marijuana use?
  - Is it better for marijuana users to smoke (which is the most popular form of intake) or to vape marijuana?