TRENDS IN EMERGING TOBACCO PRODUCT USE IN THE UNITED STATES

The E-Cigarette Summit • April 29, 2019
THE EVOLUTION OF E-CIGARETTES

1st Generation

2nd Generation

3rd Generation

4th Generation
<table>
<thead>
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<tbody>
<tr>
<td>Biennial</td>
<td>Annual</td>
<td>Annual</td>
<td>2009-2010</td>
<td>2012-2013</td>
<td>2013-2014</td>
<td>Annual</td>
<td>Biennial</td>
<td>Every 3-4 years</td>
<td>Annual</td>
<td>Annual</td>
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<tr>
<td>H.S. students</td>
<td>Adults</td>
<td>6th through 12th graders</td>
<td>Adults</td>
<td>All ages from birth</td>
<td>Adults</td>
<td>Adults and Youth</td>
<td>Adults and Youth</td>
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<tr>
<td></td>
<td>&gt;18 years</td>
<td>&gt;12 years</td>
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<td>&gt;12 years</td>
<td>&gt;12 years</td>
<td>&gt;12 years</td>
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<tr>
<td>~16,000</td>
<td>~400,000</td>
<td>~18,000</td>
<td>~75,000</td>
<td>~35,000 interviewed, ~10,000 examined</td>
<td>~240,000 nationally</td>
<td>~70,000</td>
<td>~4,000</td>
<td>~46,000</td>
<td>~4,000 adults, ~1,000 youth</td>
<td>~45,000</td>
<td>Ranges from 1,000 to 3,400 per state</td>
</tr>
<tr>
<td>CDC (DASH)</td>
<td>CDC (DPH)</td>
<td>CDC (OSH), FDA (CTP)</td>
<td>CDC (OSH), FDA (CTP)</td>
<td>CDC (NCHS)</td>
<td>NCI, 2014-2015 co-sponsored by FDA (CTP)</td>
<td>SAMHSA</td>
<td>NCI, FDA (2015+)</td>
<td>NIH (NIDA), FDA (CTP)</td>
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~46,000
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Ranges from 1,000 to 3,400 per state
1. Adult Data
2. Youth Data
3. Rapid Response Surveillance
4. Gaps and Future Directions
Adult Data

Youth Data

Rapid Response Surveillance

Gaps and Future Directions
TOBACCO PRODUCT USE AMONG U.S. ADULTS, BY TOBACCO PRODUCT AND SEX, 2017

PERCENTAGE OF U.S. ADULTS REPORTED E-CIGARETTE USE “EVERY DAY” OR “SOME DAYS”, 2017

- **Overall**: 2.8%
- **Male**: 3.3%
- **Female**: 2.4%
- **18-24**: 5.2%
- **25-44**: 3.6%
- **45-64**: 2.4%
- **≥65**: 0.7%
- **Non-Hispanic White**: 3.3%
- **Non-Hispanic Black**: 2.2%
- **Non-Hispanic Asian**: 0.9%
- **Hispanic**: [VALUE]0
- **Non-Hispanic Multirace**: 5.6%

PERCENTAGE OF U.S. ADULTS WHO REPORTED RECENT E-CIGARETTE USE, PATH STUDY, 2013 -2014

CURRENT E-CIGARETTE USE AMONG U.S. ADULTS, NHIS, 2014-2017

Source: National Health Interview Survey 2014-2017
EVER USE OF E-CIGARETTES AMONG CURRENT, FORMER, AND NEVER ADULT CIGARETTE SMOKERS — 2010-2018

Source: CDC licensed data fielded by Porter Novelli Services. Summer Styles Survey, 2010-2018
CIGARETTE SMOKING STATUS AMONG CURRENT ADULT E-CIGARETTE USERS, BY AGE – NHIS, 2015

CURRENT E-CIGARETTE USE AMONG U.S. ADULTS, BRFSS, 2017

* Current use defined as “every day” or “some day” use

- 2.3% – 3.7%
- 3.8% – 4.2%
- 4.3% – 4.7%
- 4.8% – 7.1%
FREQUENCY OF USE AMONG CURRENT U.S. ADULT USERS, 2012-2014

PRIMARY REASONS FOR USING E-CIGARETTES AMONG CURRENT U.S. ADULT USERS, APRIL-JUNE 2014

- Cessation/Health: 24%
- Consideration of Others: 13%
- Convenience: 20%
- Cost: 16%
- Curiosity: 9%
- Flavering: 8%
- Simulation of Cigarettes: 10%

PERCEIVED HARM OF E-CIGARETTES RELATIVE TO CIGARETTES AMONG U.S. ADULTS, 2015

CURRENT TOBACCO PRODUCT USE AMONG U.S. HIGH STUDENTS, BY TOBACCO PRODUCT AND SEX – NYTS, 2018

CURRENTLY TOBACCO PRODUCTS AMONG US HIGH SCHOOL STUDENTS, BY PRODUCT – NYTS, 2011–2018

FREQUENCY OF YOUTH E-CIGARETTE USE - NYTS, 2014

EVER USE OF CANNABIS IN AN E-CIGARETTE AMONG YOUTH E-CIGARETTE USERS - NYTS, 2016

### REASONS FOR YOUTH E-CIGARETTE USE - NYTS, 2016

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friend or family member used them</td>
<td>31.6</td>
</tr>
<tr>
<td>Some other reason</td>
<td>[VALUE]</td>
</tr>
<tr>
<td>They are available in flavors, such as mint, candy, fruit, or chocolate</td>
<td>[VALUE]</td>
</tr>
<tr>
<td>They are less harmful than other forms of tobacco, such as cigarettes</td>
<td>17.1</td>
</tr>
<tr>
<td>To try to quit using tobacco products such as cigarettes</td>
<td>7.8</td>
</tr>
<tr>
<td>They can be used in areas where other tobacco products, such as cigarettes are not allowed</td>
<td>[VALUE]</td>
</tr>
<tr>
<td>They are easier to get than other tobacco products such as cigarettes</td>
<td>4.8</td>
</tr>
<tr>
<td>They cost less than other tobacco products such as cigarettes</td>
<td>3.2</td>
</tr>
<tr>
<td>Famous people on TV or in movies use them</td>
<td>1.5</td>
</tr>
</tbody>
</table>

PERCEIVED RISKS OF E-CIGARETTE USE AMONG YOUTH - NYTS, 2016

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Adult Data</td>
</tr>
<tr>
<td>2</td>
<td>Youth Data</td>
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<tr>
<td>3</td>
<td>Rapid Response Surveillance</td>
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<tr>
<td>4</td>
<td>Gaps and Future Directions</td>
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</tbody>
</table>
THE LANDSCAPE IS EVOLVING.....SO MUST WE

Internet Surveys
Retail Scanner Data
Social Media
63% of JUUL users ages 15-24 did not know nicotine is always in the device

3 in 4 youth who used JUUL say they got the device from a physical retail location

1 in 5 middle and high school students have seen JUUL used at school

INTERNET PANEL SURVEYS OF U.S. YOUTH

E-Cigarette Dollar Sales, United States, 2013-2018

E-Cigarette Market Share, United States, 2013-2018

USE OF ELECTRONIC CIGARETTES SHAPED LIKE USB FLASH DRIVES AMONG US ADULTS, 2018

<table>
<thead>
<tr>
<th>Category</th>
<th>Ever Use</th>
<th>Current (Past 30 Day) Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>7.9%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Male</td>
<td>8.3%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Female</td>
<td>7.5%</td>
<td>34.3%</td>
</tr>
<tr>
<td>Never smoker</td>
<td>1.8%</td>
<td>25.7%</td>
</tr>
<tr>
<td>Former smoker</td>
<td>3.4%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Current smoker</td>
<td>[VALUE]0</td>
<td>[VALUE]0</td>
</tr>
<tr>
<td>Never EVP use</td>
<td>6.8%</td>
<td>35.6%</td>
</tr>
<tr>
<td>Former EVP use</td>
<td>2.4%</td>
<td>45.9%</td>
</tr>
<tr>
<td>Current EVP use</td>
<td>[VALUE]0</td>
<td>34.3%</td>
</tr>
</tbody>
</table>

SOCIAL MEDIA MONITORING

Twitter Posts by Theme, January 1 - July 18, 2018

Source: Gomez Y et al. The Talk of Twitter: A Qualitative Analysis of Tweets Among Youth About JUUL. Poster presented at SRNT Annual Meeting; February 21, 2019; San Francisco, CA.
SOCIAL MEDIA MONITORING

Number of JUUL-related Tweets on Twitter 2015–2017

Source: Huang et al.: how the extraordinary growth and marketing of JUUL transformed the US retail e-cigarette market Tobacco Control Published Online First: 31 May 2018.
1. Adult Data

2. Youth Data

3. Rapid Response Surveillance

4. Gaps and Future Directions
## EXISTING CHALLENGES TO E-CIGARETTE SURVEILLANCE

| The current landscape of ENDS — including product design and availability, sales, marketing, use, and related legislation — is one of rapid change and high variability. | Procedural requirements (e.g. OMB) related to review and approval of survey instruments can limit the ability to modify measures and ensure that they reflect the rapidly dynamic ENDS landscape. |
| — | — |
| “Current” use of ENDS is defined using varying definitions across systems, including past 30 day use, “everyday” or “someday” use, and “everyday”, “someday”, or “rarely” use. | Existing questions on ever and current use of ENDS limit the ability to distinguish between trial or experimental users and more frequent and routine users of various types of ENDS products. |
| Users of ENDS refer to these products by varying terms, including “e-cigarettes”, “e-cigars”, “e-pipes”, “vape pipes”, “vaping pens”, “e-hookahs”, and “hookah pens”, among others. | The validity and reliability of existing questions on ENDS use and related behaviors have not been tested, and there is uncertainty about which measures could serve as “gold standards”. |
| Considerations related to cost, respondent burden, survey length, and other factors limit the extent to which a robust number of questions on ENDS can be included on existing surveillance systems. | All major surveillance systems are cross-sectional, which prevents the ability to assess questions with regard to ENDS, particularly timing of use relative to conventional tobacco products. |

OPPORTUNITIES FOR ENHANCED SURVEILLANCE

Expand number of surveys with e-cigarette content

Increase number of questions on e-cigarettes

Ensure questions address most appropriate constructs

Include diversity of survey modes to obtain most robust data
Most U.S. adult e-cigarette users are current and former cigarette smokers. While e-cigarette use increased among US adults from 2010-2014, use has modestly declined since that time.

Opportunities exist to improve existing surveillance efforts, including adding more robust e-cigarette content to surveillance systems, and identifying the most valid questionnaire measures for key constructs.

Current e-cigarette use is markedly higher among youth than adults. Although declines in use occurred during 2015-2017, an unprecedented surge in youth use occurred in 2018.

The e-cigarette landscape is volatile and rapid response surveillance initiatives will be critical to capture emerging patterns, particularly for novel products.
The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.