YOUTH USE OF ELECTRONIC CIGARETTES

Presented by
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Deputy Director for Research
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OVERVIEW

- U.S. Prevalence Data
- Global Prevalence Data
- Association with Cigarette Smoking – Youth and Young Adults
- Summary

No financial disclosures
U.S. PREVALENCE DATA
PAST 30 DAY TOBACCO PRODUCT USE, U.S. HIGH SCHOOL STUDENTS, NYTS 2011-2015

**Student prevalence**

<table>
<thead>
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<tbody>
<tr>
<td>Cigarettes</td>
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<td>14.0</td>
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<td>E-cigarettes</td>
<td>9.2</td>
<td>4.5</td>
<td>2.8</td>
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<td>5.4</td>
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<tr>
<td>Hookah</td>
<td>9.3</td>
<td>7.2</td>
<td>5.2</td>
<td>7.2</td>
<td>6.7</td>
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<tr>
<td>Cigars</td>
<td>11.6</td>
<td>12.6</td>
<td>11.9</td>
<td>11.6</td>
<td>11.9</td>
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<tr>
<td>Smokeless tobacco</td>
<td>7.3</td>
<td>6.4</td>
<td>5.7</td>
<td>5.5</td>
<td>5.6</td>
</tr>
</tbody>
</table>

*Significant change 2014 to 2015*

Source: [https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm](https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm)
PAST 30 DAY TOBACCO PRODUCT USE, U.S. MIDDLE SCHOOL STUDENTS, NYTS 2011-2015

Student prevalence

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<td>E-cigarettes</td>
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<td>1.1</td>
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<tr>
<td>Hookah</td>
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<td>1.1</td>
<td>2.5</td>
<td>2</td>
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Sources: [https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm](https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm)
PAST 30 DAY U.S. STUDENT CIGARETTE SMOKING BY GRADE, NYTS & MTF 2014-2016

NYTS is National Youth Tobacco Survey; MTF is Monitoring the Future
*2016 NYTS estimates have not been publicly released
Sources: [https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm](https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm) and [http://monitoringthefuture.org/](http://monitoringthefuture.org/)
PAST 30 DAY U.S. STUDENT E-CIGARETTE USE BY GRADE, NYTS & MTF 2014-2016

NYTS is National Youth Tobacco Survey; MTF is Monitoring the Future
*2016 NYTS estimates have not been publicly released

Sources https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm and http://monitoringthefuture.org/
CIGARETTE SMOKING STATUS, AMONG U.S. HIGH SCHOOL CURRENT E-CIG USERS, NYTS 2011-2015

Source: https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm
“Thinking about all types of electronic cigarettes or e-cigarettes, have you used the disposable kind or rechargeable/refillable tank kind?”

- Used e-cigs 1-19 of past 30 days:
  - Disposable only: 40.7%
  - Rechargeable/Refillable only: 9%
  - Both types: 51.8%

- Used e-cigs 20-30 of past 30 days:
  - Disposable only: 3.5%
  - Rechargeable/Refillable only: 51.8%
  - Both types: 44.7%

Source: https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm
YOUTH PREVALENCE AND FREQUENCY OF USE, THE PATH STUDY WAVE 1*

Frequent use is defined as: use of a product on 20 or more of the past 30 days; frequent use of “any tobacco” product reflects only those who used a particular product on 20 or more of the past 30 days; daily use of “any tobacco” product reflects daily use of a particular product.

*September 2013 – December 2014
GLOBAL PREVALENCE DATA
GLOBAL YOUTH TOBACCO SURVEY (GYTS)

- School-based survey of students aged 13–15 years
- Multistage sample design with schools selected proportional to enrollment size
- Classrooms chosen randomly within selected schools
- All students in selected classes eligible for participation
- Anonymous and confidential self-administered questionnaire
- Countries may add questions to the questionnaire
- Computer-scannable answer sheets level

Source: https://www.cdc.gov/tobacco/global/
CURRENT E-CIGARETTE USE AMONG STUDENTS AGED 13-15 YEARS, GYTS, 2013

Source: https://nccd.cdc.gov/GTSSDataSurveyResources/Ancillary/DataReports.aspx?CAID=1
E-CIGARETTE USE AMONG STUDENTS IN POLAND, 2014-2015

- Poland GYTS - adapted
- “socially disadvantaged rural area”
- 3,552 students
- 13-19 years

E-CIGARETTE USE AMONG STUDENTS IN FRANCE, 2014

- 3,319 middle and high school students
- 80% of youth who ever tried smoking had tried e-cigarettes
- 16% of never smokers had tried e-cigarettes

ASSOCIATION WITH CIGARETTE SMOKING
– YOUTH AND YOUNG ADULTS
CIGARETTE SMOKING AMONG YOUTH AND YOUNG ADULT E-CIGARETTE USERS – LONGITUDINAL STUDIES*

Meich R et al. Tob Control 2017;0:1-6
Unger J et al. Drug & Alcohol Dep 2016; 163: 261-264

* All statistically significant except Spindle - current
** Among e-cig users not susceptible to cigarette smoking
*** Relative risk; others are odds ratios
<table>
<thead>
<tr>
<th>Authors</th>
<th>Begin of Study</th>
<th>Place</th>
<th>Age or Grade</th>
<th>Study Length</th>
<th>Sample of nonsmoker e-cig users</th>
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</thead>
<tbody>
<tr>
<td>Wills, et al. (2016)</td>
<td>2013</td>
<td>Schools in Oahu, Hawaii</td>
<td>14-16 years</td>
<td>12 months</td>
<td>215 - ever</td>
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<tr>
<td>Barrington-Trimis, et al. (2016)</td>
<td>2014</td>
<td>Southern California</td>
<td>11th &amp; 12th graders (avg. 17.4)</td>
<td>16 months</td>
<td>146 – ever; 94 (non-susceptible)</td>
</tr>
<tr>
<td>Meich, et al. (2017)</td>
<td>2014</td>
<td>National</td>
<td>12th graders</td>
<td>12 months</td>
<td>54 - ever</td>
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<tr>
<td>Primack, et al. (2015)</td>
<td>2012/2013</td>
<td>Derived from a national sample</td>
<td>16-26 years (avg. 19.5)</td>
<td>12 months</td>
<td>16 (non-susceptible)</td>
</tr>
<tr>
<td>Unger, et al. (2016)</td>
<td>2014</td>
<td>Southern California</td>
<td>Avg. 22.7 years</td>
<td>12 months</td>
<td>42 current</td>
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<tr>
<td>Spindle, et al. (2017)</td>
<td>2014</td>
<td>Mid-Atlantic U.</td>
<td>Avg. 18.5 years</td>
<td>12 months</td>
<td>153 - ever; 45 -current</td>
</tr>
<tr>
<td>Authors</td>
<td>Tobacco Measures</td>
<td>Covariates in addition to sociodemographics</td>
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<td>------------------------------</td>
<td>--------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Leventhal, et al (2015)</td>
<td>Ever e-cig use to any smoking in prior 6 months</td>
<td>Family and peer smoking, depression, substance use, impulsivity, delinquent behavior, susceptibility</td>
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<tr>
<td>Barrington-Trimis, et al (2016)</td>
<td>Ever e-cig use to ever smoking;</td>
<td>Friend smoking, friend influences, susceptibility</td>
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<tr>
<td>Spindle, et al (2017)</td>
<td>Ever e-cig use to ever smoking</td>
<td>Impulsivity, depression, anxiety, marijuana, peer deviance, recent stressful life events</td>
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</tr>
</tbody>
</table>
FACTORS TO CONSIDER WHEN ASSESSING YOUTH E-CIGARETTE USE*

- Smoking and other tobacco use
- Peer use/influences
- Parent and family use/influences
- Intrapersonal, e.g., depression, anxiety, sensation-seeking
- Advertising
- Appeal, e.g., flavors, ease of use, cloud tricks
- Perceptions of health risks/effects
- Alcohol, marijuana, and other substance use
- Nicotine concentration

* Not an exhaustive list
E-cigarette use among U.S. youth has increased since 2011
  - Pattern from 2014-2016 less clear
  - Differences between NYTS and MTF
Wide variation in current youth e-cigarette use in countries surveyed
  - 2.8% in Greece (2013) to 27% in Poland (2015)
  - Higher among boys than girls
Association with cigarette smoking
  - Seven longitudinal studies with positive associations
  - No studies have shown a protective effect of e-cigarette use preventing cigarette smoking
  - Variation in make-up of populations (age, race/ethnicity), geographic locations, tobacco use measures, covariates, and confidence intervals
THANK YOU