Public Health Promise or Peril?

The Rise of Electronic Tobacco Products and Implications for Tobacco Control Policy and Practice

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Patterns of Use

Health Effects

Hot Topics

Policy Options
The Ever Changing Tobacco Product Landscape

Source: Tobacco Situation and Outlook Report, U.S. Department of Agriculture, U.S. Census
Note: Among persons >18 years old. Beginning in 1982, fine-cut chewing tobacco was reclassified as snuff.
The Evolving Tobacco Product Landscape

- Smokeless
- Snus
- Bidis
- Kreteks
- Cigarettes
- Cigars, Cigarillos, Little Cigars
- Pipes
- Hookah
- Dissolvables
- ENDS
E-cigarettes
Ever Use of E-cigarettes Among Adults, by Cigarette Smoking Status—U.S., 2010-2017

Source: CDC. Styles Survey. 2010-2016
Percentage of U.S. Adults Aged ≥18 Who Reported E-cigarette Use “Every Day” or “Some Days”, 2015

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Overall</td>
<td>3.5</td>
</tr>
<tr>
<td>Male</td>
<td>4.3</td>
</tr>
<tr>
<td>Female</td>
<td>2.6</td>
</tr>
<tr>
<td>18-24</td>
<td>5.2</td>
</tr>
<tr>
<td>25-44</td>
<td>4.3</td>
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<tr>
<td>45-64</td>
<td>3.3</td>
</tr>
<tr>
<td>≥65</td>
<td>1.1</td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>4.1</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>1.9</td>
</tr>
<tr>
<td>Non-Hispanic Asian</td>
<td>2.3</td>
</tr>
<tr>
<td>Non-Hispanic AIAN</td>
<td>** Relative standard error ≥30% **</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2</td>
</tr>
<tr>
<td>Non-Hispanic Multirace</td>
<td>7.1</td>
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A majority of adult e-cigarette users also smoke conventional cigarettes: “dual use.”

Cigarette smoking status among current adult e-cigarette users, by age group

E-cigarette Use Frequency Among Current Adult Users

Patterns of E-cigarette Use Frequency - National Adult Tobacco Survey, 2012-2014. Sharapova SR\textsuperscript{1}, Singh T\textsuperscript{2}, Agaku IT\textsuperscript{3}, Kennedy SM\textsuperscript{4}, King BA\textsuperscript{3}.

Primary Reasons for Using E-cigarettes Among Current Adult Users

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

E-cigarette Use Among US Youth

E-CIGARETTES ARE NOW THE MOST COMMONLY USED TOBACCO PRODUCT AMONG U.S. YOUTH.

In 2016, more than 2 MILLION U.S. middle and high school students used e-cigarettes in the past 30 days, including:

- 4.3% MIDDLE SCHOOL STUDENTS
- 11.3% HIGH SCHOOL STUDENTS

In the U.S., youth are more likely than adults to use e-cigarettes.
Trends in Use Among US Youth

**High School**
- 2011: 1.5
- 2012: 2.8
- 2013: 4.5
- 2014: 13.4
- 2015: 16.0
- 2016: 11.3

**Middle School**
- 2011: 0.6
- 2012: 1.1
- 2013: 1.1
- 2014: 3.9
- 2015: 5.3
- 2016: 4.3

**Source:** Centers for Disease Control and Prevention & U.S. Food and Drug Administration. National Youth Tobacco Survey.
Reasons for Youth E-cigarette Use

- Friend or family member used them: [VALUE]0
- Some other reason: 31.6%
- They are available in flavors, such as mint, candy, fruit, or chocolate: [VALUE]0
- They are less harmful than other forms of tobacco, such as cigarettes: 17.1%
- To try to quit using tobacco products such as cigarettes: 7.8%
- They can be used in areas where other tobacco products, such as cigarettes are not allowed: [VALUE]0
- They are easier to get than other tobacco products such as cigarettes: 4.8%
- They cost less than other tobacco products such as cigarettes: 3.2%
- Famous people on TV or in movies use them: 1.5%

Frequency of Youth E-cigarette Use

1-2 DAYS: 54.5% (Middle School), 45.4% (High School)
3-5 DAYS: 17.3% (Middle School), 16.2% (High School)
6-9 DAYS: 9.2% (Middle School), 12% (High School)
10-19 DAYS: 7.3% (Middle School), 10.9% (High School)
20-29 DAYS: 3.9% (Middle School), 5.8% (High School)
ALL 30 DAYS: 7.9% (Middle School), 9.7% (High School)

Conclusion 16-2. Among youth and young adult e-cigarette users who ever use combustible tobacco cigarettes, there is moderate evidence that e-cigarette use increases the frequency and intensity of subsequent combustible tobacco cigarette smoking.
What Factors Lead to Youth Smoking?

- Youth-appealing flavors
- Youth-resonating themes
- Low prices/price promotions
- Ease of access & product use
- Exposure to ads
- Health claims

“E-cigarettes are marketed by promoting flavors and using a wide variety of media channels and approaches that have been used in the past for marketing conventional tobacco products to youth and young adults.”
Flavored E-cigarette Use Among Youth

85% of e-cigarette users ages 12-17 use flavors:
- menthol
- alcohol
- candy
- fruit
- chocolate
- sweets
Youth Exposure to E-cigarette Advertising

E-CIGARETTE ADS REACH NEARLY 4 IN 5 U.S. MIDDLE AND HIGH SCHOOL STUDENTS

More than 20 million youth saw e-cigarette ads in 2016.

PERCENT OF STUDENTS EXPOSED TO E-CIGARETTE ADS

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent</th>
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<tbody>
<tr>
<td>2014</td>
<td>68.9</td>
</tr>
<tr>
<td>2015</td>
<td>73.0</td>
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<tr>
<td>2016</td>
<td>78.2</td>
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YOUTH EXPOSURE TO E-CIGARETTE ADS, 2016

- **Retail Stores**: 68.0% (17.7 million)
- **Television**: 37.7% (9.7 million)
- **Internet**: 40.6% (10.6 million)
- **Newspapers & Magazines**: 23.9% (6.2 million)

Efforts to reduce youth exposure to e-cigarette ads are important to prevent and reduce youth use of these products.

Source: National Youth Tobacco Survey
E-cigarette Marketing Uses Traditional Tactics

1940’s / 1950’s

2010’s

Source: www.tobaccodocuments.org.
Marketing for Nicotine Replacement Therapy

Text on patch:
"I wear it because I'm a 69-year old basketball player. And I plan on being an 80-year old basketball player."

Sources: Sports Illustrated; Blu eCigs; NJOY.
Marketing for E-cigarettes

Sources: Sports Illustrated; Blu eCigs; NJOY.
E-cigarettes could have negative and positive individual and population health impact

“This shift in patterns of tobacco use could have a number of potential impacts, ranging from the positive effect of accelerating the rate at which smokers quit smoking cigarettes completely to a negative effect of slowing down the decrease in the use of all tobacco products, especially cigarettes”

Chapter 15, Page 859
Is there a potential benefit for e-cigarettes?
Answer: Under certain circumstances

- Complete long term substitution by established smokers
- Assist in rapid transition to a society with little or no use of combustible products
- Short-term use if shown to produce successful & permanent cessation of combustible products

However, “Cutting back” is not enough—even a few cigarettes per day is dangerous
“Cutting back” is not enough—even a few cigarettes per day is dangerous

<table>
<thead>
<tr>
<th>RISKS FOR DUAL USERS OF CIGARETTES AND E-CIGARETTES</th>
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<tr>
<td>- Smoking just five cigarettes a day doubles the risk of dying from heart disease.</td>
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<td>- Heavy smokers who reduce their cigarette use by half do not reduce their risk of early death by half.</td>
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<tr>
<th>BENEFITS OF QUITTING SMOKING COMPLETELY</th>
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<tr>
<td>- Heart disease risk is cut in half one year after quitting and continues to drop over time.</td>
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<tr>
<td>- Even quitting at age 50 cuts your risk in half for early death from a smoking-related disease.</td>
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E-Cigarette Use As A Smoking Cessation Tool Among Adults

“The long-term safety of e-cigarettes is unknown.”

“There is evidence from two trials that e-cigarettes help smokers to stop smoking in the long term compared with placebo e-cigarettes. However, the small number of trials, low event rates and wide confidence intervals around the estimates mean that our confidence in the result is rated 'low' by GRADE standards.”

“Overall, the USPSTF found the evidence on the use of ENDS as a smoking cessation tool in adults, including pregnant women, and adolescents to be insufficient.”

E-cigarette Potential for Harm if:

1. Leads to initiation of combustible tobacco use among non-smokers, particularly children.
2. Leads to relapse among former smokers.
3. Diminishes the chances that a smoker will quit.
4. Discourages smokers from using proven quit methods.
5. Exposes children, pregnant women, and non-users to secondhand aerosol.
6. Glamorizes or renormalizes tobacco use.
7. Results in poisonings among users or non-users.
Conclusion 5: E-cigarette aerosol is not harmless. It can contain harmful and potentially harmful constituents, including nicotine.
Nicotine Poses Unique Dangers to Young People

Chapter 3
Conclusion 1, 2, & 5

1. Nicotine exposure during adolescence can cause addiction and can harm the developing adolescent brain.

2. Nicotine can cross the placenta and has known effects on fetal and postnatal development. Therefore, nicotine delivered by e-cigarettes during pregnancy can result in multiple adverse consequences, including sudden infant death syndrome, and could result in altered corpus callosum, deficits in auditory processing, and obesity.

5. Ingestion of e-cigarette liquids containing nicotine can cause acute toxicity and possibly death if the contents of refill cartridges or bottles containing nicotine are consumed.
Are Youth Using E-cigarettes with Nicotine?

Self-reported nicotine consumption among youth may be subject to bias:

- Youth may not know what nicotine is, let alone whether it is in their e-cigarette.
- Youth who access e-cigarettes from peers may not see packaging.
- Some e-cigarette labels obscure nicotine content.
- Question asked respondents to choose only one response option.

Percentage of products that contained nicotine

- 99.6% of disposable e-cigarette sales
- 100% of rechargeable sales
- 99.5% of refill sales

Percentage that contained nicotine by product type

- 99.6% of all e-cigarette products sold
- 99.4% of flavored e-cigarette products
- 99.9% of non-flavored e-cigarette products

Flavorings

75% of e-cigarette flavors tested contain diacetyl

Diacetyl is associated with bronchiolitis obliterans, a respiratory disease known as “popcorn lung.”
Some e-cigarette manufacturers claim flavorings are safe because they meet the FDA definition of “Generally Recognized as Safe” (“GRAS”).

Your Gut Can Handle More Than Your Lungs

GRAS does not apply to products that are not food
Conclusion: E-cigarette products can be used as a delivery system for cannabinoids and potentially for other illicit drugs.”
The Rise of JUUL

An increasingly popular e-cigarette, called JUUL, is shaped like a USB flash drive.

JUUL craze getting teens hooked on high levels of nicotine, health officials fear

‘I Can’t Stop’: Schools Struggle With Vaping Explosion

Juuling, ‘peanut butter cup’-flavored vapes: Young adults experiment with e-cigarettes

Juul emerges as vape of choice among teens

The U.S. Surgeon General warns e-cigarette use is a growing public health concern. Sean Dowling (@seandowlings) has more. Buzz60
Top Selling E-cigarettes in the U.S.

Source: Nielsen Total US xAOC/Convenience Database and Wells Fargo Securities, LLC
“Heat Not Burn” Products

- Contain Tobacco
- “Throat-Hit” similar to cigarettes
- Positioned to appeal to smokers who have tried and rejected e-cigarettes

Above: Revo Cigarettes

Above: Eclipse Cigarettes
The battery case contains and charges the IQOS holder after each use.

A “HeatStick” is inserted into the holder. An electronically powered blade within the holder pierces the HeatStick and heats up the tobacco inside to roughly 570 degrees.

The HeatStick contains tobacco powder and a hollow area to cool down the air being inhaled. Because tobacco is heated instead of burned, there is no smoke and fewer carcinogens, the company says.

Source: The Washington Post and Phillip Morris International
A scientific advisory committee met to discuss the MRTP application in January 2018.

Philip Morris International submitted applications to FDA for approval to:
- Market iQOS (“Premarket Tobacco Product Application” or PMTA)
- Make health claims (“Modified Risk Tobacco Product” application or MRTP)
Ever Use of Heat-Not-Burn Products Among U.S. Adults, 2017

Patterns of Use

Health Effects

Hot Topics

Policy Options
Barriers to Reducing Tobacco Use

- Tobacco easily accessible
- Smoking in public legal
- Unfettered advertising
- Poor access to cessation help

Individual

Tobacco Addiction

Society
Major Conclusion

“Action can be taken at the national, state, local, tribal, and territorial levels to address e-cigarette use among youth and young adults. Actions could include incorporating e-cigarettes into smoke-free policies, preventing access to e-cigarettes by youth, price and tax policies, retail licensure, regulation of e-cigarette marketing likely to attract youth, and educational initiatives targeting youth and young adults.”
Stakeholders Who Can Take Action

- Individuals, parents, and families
- Teachers, coaches, and other youth influences
- Civic and community leaders
- Public health and health care professionals
- Researchers
- Federal government
- State, local, tribal, and territorial governments
- E-cigarette manufacturers, distributors, and retailers
- Voluntary health agencies, non-governmental organizations, and other community and faith based organizations
Public Health Actions to Address E-Cigarettes

Federal Regulation

*Family Smoking Prevention and Tobacco Control Act*

- Signed into law on June 22, 2009
- Granted FDA the authority to regulate tobacco products
- Enhances the ability to intensify policy to reduce tobacco industry influence
  - Manufacturing
  - Marketing
  - Sale

State, Local, Territory

*Potential Sub-National Action:*

- Including e-cigarettes in smokefree indoor air policies
- Restricting youth access to e-cigarettes in retail settings
- Licensing retailers
- Establishing specific package requirements
- Setting price policies
New FDA Manufacturer Requirements:

- Registering manufacturing establishments and providing product listings to the FDA
- Reporting ingredients, and harmful and potentially harmful constituents
- Requiring premarket review and authorization of new tobacco products by the FDA
- Placing health warnings on product packages and advertisements
- Not marketing newly deemed tobacco products (including e-cigarettes) with modified risk claims unless authorized by the FDA.
States With & Without Laws Prohibiting Smoking & Use of E-cigarettes in Indoor Areas of Private Worksites, Restaurants, & Bars – U.S., December 2017

Source: Centers for Disease Control and Prevention. STATE System. 2016.
Tobacco Control Hurdles

- Evolving Landscape
- Disparities
- Industry Influence
- Limited Resources
The tobacco epidemic was initiated and has been sustained by the aggressive strategies of the tobacco industry, which has deliberately misled the public on the risks of smoking cigarettes.

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<th>Takeaways</th>
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<td><strong>1</strong> Youth use of tobacco products in any form, including electronic tobacco products, is unsafe.</td>
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<td><strong>2</strong> Adult smokers must completely quit to realize benefits from e-cigarettes. E-cigarettes are not currently an FDA approved quit aid.</td>
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<tr>
<td><strong>3</strong> Recently, the electronic product landscape has diversified to include new products, including JUUL and heated tobacco products.</td>
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<tr>
<td><strong>4</strong> The tobacco product landscape continues to diversify, and it’s critical to modernize tobacco control strategies to adapt to these changes.</td>
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For more information, contact CDC
1-800-CDC-INFO (232-4636)

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.