MISPERCEPTION OF E-CIGARETTE HARM GROWING AMONG AMERICAN ADULTS, 2013-2015


T. Verron, M. Guo, B. Varignon, G. O’Connell, T. Walele, X. Cahours
AGENDA

- Population Assessment of Tobacco and Health (PATH) Study
- Perceptions of the Relative Harm of Electronic Cigarettes
  - US Population
  - Age and gender
  - Cigarette smokers perception
  - E-cigarette users perception
- Impact of risk perception on switching and cessation
- Risk perception forecast
• The Population Assessment of Tobacco and Health (PATH) Study is a nationally representative longitudinal study of tobacco use and health in the United States. A collaboration between the National Institutes of Health (NIH), National Institute on Drug Abuse (NIDA) and the U.S. Food and Drug Administration (FDA) Center for Tobacco Products.

• The study was launched in 2011, started the first wave of data collection in 2013, and completed its fourth wave in late 2017.

• The present study focussed on the PATH data contained in the adult interviews obtained in 2013 (Wave 1) and again in 2015 (Wave 2).
PATH AIMS

• Examine what makes people susceptible to using a tobacco product
• Evaluate initiation and use patterns, including the:
  • use of newer products, such as e-cigarettes
  • use of multiple products
  • switching from one product to another
• Study patterns of tobacco product use, cessation, and relapse
• Track potential behavioral and health impacts, including biomarkers of exposure and harm
• Assess differences in tobacco-related attitudes, behaviors, and health conditions among racial/ethnic, gender, and age subgroups
In both waves, adults and youth were asked about seven main types of tobacco products*

The majority of the questions fit into one of the following categories.

- Ever use
- Recency of use
- Frequency of use
- Amount of use
- Brands used
- Purchase details

Additional topics included

- Polyuse
- Nicotine dependence
- Packaging and health warnings
- Risk and harm perceptions
- Secondhand smoke exposure
- Marketing and advertising
- Media use
- Demographics
- Health
- Psychosocial and mental health
- Substance use
- Cessation
- Peer and family influences

*Bidis and kreteks were additional types asked about on the Youth Interview, but were not asked on the Adult Interview.
• The Wave 1 targets population of the PATH Study is the civilian **household population** 18 years of age or older and youth 12 to 17 years old in the U.S. (the 50 states and the District of Columbia).

• About 46,000 people aged 12 years and older, including tobacco users and non-users, were included in the first wave of the PATH Study.

• The Wave 1 sample for the PATH Study was selected using a **four-stage, stratified probability sample design**.
A FOUR-STAGE, STRATIFIED PROBABILITY SAMPLE DESIGN

1st stage
A stratified sample of 156 geographical primary sampling units (PSUs) was selected

2nd stage
Smaller geographical segments (6,049 second-stage sampling units)

3rd stage
Residential addresses in the US Postal Service Computerised Delivery Sequence Files (166,088)

4th stage
Persons from the sampled households (76,526 SPs)

Constraint: They used higher selection probabilities for young adults, African-Americans and tobacco users, based on the information provided by the household informant.

Sample is not representative of the US population

To make inference on US population, need to use weights
WEIGHTING

Analysis of data from complex sample designs, involves weighting to compensate for different probabilities of selection, non-response and possible deficiencies in the sampling frame (e.g., over or under-coverage of certain population groups).

Weights and replicate weights (based on BRR approach) enable the data to be analysed are provided in the database.
Question AE1099 “Is using an e-cigarette less harmful, about the same, or more harmful than smoking cigarettes?”

- R01_AE1062: Use / used e-cigarettes because: They might be less harmful to me than cigarette
- R01_AE1075: Use / used e-cigarettes because: They might be less harmful to people around me than cigarettes
“Is using an e-cigarette less harmful, about the same, or more harmful than smoking cigarettes?”

In 2013, more than 50% of the U.S. population thought that e-cigarette is about the same, or more harmful than cigarette.
“Is using an e-cigarette less harmful, about the same, or more harmful than smoking cigarettes?”

In 2013 (Wave 1)

- Less Harmful: 41%
- Same or More Harmful: 54%

In 2015 (Wave 2)

- Less Harmful: 31%
- Same or More Harmful: 65%

Between 2013 and 2015, a growing proportion of the U.S. public and smokers does not recognise that e-cigarettes are less harmful than smoking.
Risk perception according to age and gender

Risk perception trend is independent of the class of age

Risk perception trend is independent of the Gender
RISK PERCEPTION FOR CIGARETTE SMOKERS

“Is using an e-cigarette less harmful, **about the same, or more harmful** than smoking cigarettes?”

<table>
<thead>
<tr>
<th></th>
<th>Never Smoker (n=4768)</th>
<th>Experimental Smoker (n=6575)</th>
<th>Current Smoker (n=8895)</th>
<th>Former Smoker (n=3852)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1</td>
<td>63%</td>
<td>53%</td>
<td>43%</td>
<td>51%</td>
</tr>
<tr>
<td>W2</td>
<td>72%</td>
<td>65%</td>
<td>57%</td>
<td>63%</td>
</tr>
</tbody>
</table>
RISK PERCEPTION FOR E-CIGARETTE USERS

“Is using an e-cigarette less harmful, **about the same, or more harmful** than smoking cigarettes?”

<table>
<thead>
<tr>
<th>User Type</th>
<th>W1</th>
<th>W2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never User (n=14792)</td>
<td>58%</td>
<td>68%</td>
</tr>
<tr>
<td>Ever User (n=9374)</td>
<td>39%</td>
<td>52%</td>
</tr>
<tr>
<td>Experimental User (n=7518)</td>
<td>43%</td>
<td>56%</td>
</tr>
<tr>
<td>Current User (n=1298)</td>
<td></td>
<td>16%</td>
</tr>
<tr>
<td>Former User (n=546)</td>
<td></td>
<td>30%</td>
</tr>
</tbody>
</table>
Impact of risk perception on switching and cessation

❖ Does the risk perception impact smoking cessation?

Among smokers who stopped smoking between 2013 and 2015, 50% thought that the e-cigarette was less harmful than the cigarette, and 50% thought the opposite.

❖ Does the risk perception related to switching from cigarette to e-cigarette?

≈95% of people who switched from cigarette to e-cigarette between 2013 and 2015, thought that it was less harmful than smoking.
Risk perception forecast

What will happen in 5 years, if nothing is done, positively or negatively, to change the risk perception?

**Observations**

<table>
<thead>
<tr>
<th>W1</th>
<th>W2</th>
</tr>
</thead>
<tbody>
<tr>
<td>57% Less Harmful</td>
<td>43% Same or More Harmful</td>
</tr>
<tr>
<td>14% Same or More Harmful</td>
<td>86% Less Harmful</td>
</tr>
</tbody>
</table>

**Model**

Dynamic Population Model based on Markov chains

**Transition matrix**

<table>
<thead>
<tr>
<th></th>
<th>W2</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1</td>
<td>Less</td>
</tr>
<tr>
<td>Less</td>
<td>57%</td>
</tr>
<tr>
<td>Same or More</td>
<td>14%</td>
</tr>
</tbody>
</table>

**Predictions**

\[ \approx 70\% (+27\%) \text{ of the US smokers will perceive e-cigarette as same or more harmful than cigarette} \]
The proportion of adult US smokers who believed e-cigarettes were just as, or more, harmful than smoking increased substantially from 43% in 2013 to 57% in 2015.

If nothing is done this proportion could reach up to 70% in the five next years.

Nevertheless, 95% of smokers who switched from cigarette to e-cigarette thinks that the e-cigarette is less harmful than the cigarette.

Therefore misperceptions of the relative harm of e-cigarettes compared with conventional cigarettes need to be urgently addressed, particularly among smokers who may benefit from switching to e-cigarettes.
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