(Mis-)Perceptions of relative risks:

Tobacco Cigarettes vs Snus/E-cigarettes

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1) How do the general population and the smokers assess the risk difference between combustible cigarettes and non-combustible nicotine products (Snus, E-cigarettes, NRTs)?
2) Are their perceptions of relative risk consistent with medical consensus?
1) Perceived risk: Smokers/general population?

2) Consistent with estimates from medical expert?

3) How do the tobacco control community react when (repeatedly) being made aware of widespread misperceptions?
Perceived health risk on a scale from 1 (small risk) to 7 (huge risk) from daily use
General population aged 16–74 years 2003–2017
Statistics, Norway
Perceived health risk on a scale from 1 (small risk) to 7 (huge risk) from daily use
General population aged 16–74 years 2003–2017
Statistics, Norway
Perceived health risk on a scale from 1 (small risk) to 7 (huge risk) from daily use
General population and daily smokers aged 16-74, 2017
Statistics, Norway

Cigarettes: 6.55 (General population), 6.29 (Daily smokers)
Snus: 5.15 (General population), 5.01 (Daily smokers)
E-cig: 3.76 (General population), 3.84 (Daily smokers)
NRT: 3.53 (General population), 3.39 (Daily smokers)
Perceptions of relative risk (%) on a scale* where cigarettes are given maximum harm

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarettes</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Snus</td>
<td>78,6</td>
<td>79,7</td>
<td>85,5</td>
<td>88,5</td>
</tr>
<tr>
<td>E-cigarettes</td>
<td>57,4</td>
<td>61,0</td>
<td>75,7</td>
<td>63,7</td>
</tr>
<tr>
<td>E-cig without nicotine</td>
<td></td>
<td></td>
<td>47,4</td>
<td></td>
</tr>
<tr>
<td>NRT (gum)</td>
<td>53,9</td>
<td>53,9</td>
<td></td>
<td>55,3</td>
</tr>
<tr>
<td>Chantix</td>
<td></td>
<td></td>
<td></td>
<td>62,3</td>
</tr>
<tr>
<td></td>
<td>(N=1734)</td>
<td>(N=150)</td>
<td>(N=350)</td>
<td>(N=670)</td>
</tr>
</tbody>
</table>

*Treating ordinal scores as linear scores
<table>
<thead>
<tr>
<th>Smokers &amp; general population</th>
<th>Perceived risk relative to cigarettes</th>
</tr>
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<tbody>
<tr>
<td>Snus</td>
<td>78% - 88%</td>
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What do the medical experts think?

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## Framework for assessments of risk

<table>
<thead>
<tr>
<th></th>
<th>Toxicological studies (chemical composition)</th>
<th>Cell-studies (cytotoxicity)</th>
<th>Clinical studies (pharmacokinetics)</th>
<th>Epidemiological studies (long term)</th>
<th>Strength of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarettes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Robust</td>
</tr>
<tr>
<td>Snus</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Strong</td>
</tr>
<tr>
<td>NRT</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Short term</td>
<td>Strong</td>
</tr>
<tr>
<td>E-cigarettes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Moderate</td>
</tr>
<tr>
<td>HnB</td>
<td>Yes</td>
<td>Few</td>
<td>Few</td>
<td>No</td>
<td>Weak</td>
</tr>
</tbody>
</table>
Estimating the Harms of Nicotine-Containing Products Using the MCDA Approach


Annual Review of Public Health

Harm Minimization and Tobacco Control: Reframing Societal Views of Nicotine Use to Rapidly Save Lives

David B. Abrams, Allison M. Glasser, Jennifer L. Pearson, Andrea C. Villanti, Lauren K. Collins, and Raymond S. Niuxra
### What do the medical experts think?

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<th>Medical experts</th>
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<tbody>
<tr>
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<td>Estimated risk relative to cigarettes</td>
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<tr>
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<td>+/- 5%</td>
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<td>+/- 5%</td>
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Possible reasons for the inconsistency:

- Methodological artefact (treating ordinal variables as linear) ?

- Smokers/general population; underestimate risk from smoking ?

- Experts biased on THR; underestimate the risk from snus & e-cig ?

- Media and health authorities misinforming the public ?
Now scientists warn:

**Snus is far more dangerous than we thought**

May cause fatal heart and brain infarction
“Government texts strongly increased snus risk belief errors, and raised already exaggerated beliefs”
Consequences of misperceptions of relative risk

• Smokers less motivated to switch product

• Disproportionate taxation and regulation
Odds ratio of using e-cigarettes in attempts to quit/reduce smoking - across beliefs on relative risk
Help-seeking smokers calling quit-line, 2013-2016 FHI

Currently using e-cig as an aid to quit smoking

<table>
<thead>
<tr>
<th>E-cig</th>
<th>No risk difference</th>
<th>Small risk difference</th>
<th>Huge risk difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

Ever used e-cig as an aid to quit smoking:

<table>
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<th>E-cig</th>
<th>No risk difference</th>
<th>Small risk difference</th>
<th>Huge risk difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>

Beliefs consistent with medical consensus
Consequences of misconceptions of relative risk

• Smokers less motivated to switch

• Support in the population towards disproportionate taxation and regulations
Percent who fully support snus-preventive measures according to beliefs on risk-difference between snus and cigarettes
Non-users of snus (N=4325) aged 16+, 2014, Ipsos/FHI

- **Tax increase**
  - No risk difference: 52%
  - Small risk difference: 31%
  - Huge difference: 58%

- **Plain packs**
  - No risk difference: 40%
  - Small risk difference: 32%
  - Huge difference: 20%

- **Ban flavoring**
  - No risk difference: 49%
  - Small risk difference: 35%
  - Huge difference: 59%
3) How does the **tobacco control community** react when (repeatedly) being made aware of widespread misperceptions?

I'm confused.....

Oh, that’s bad..., should we correct the misperceptions"
Scientific papers from Norwegian researchers demonstrating misperceptions of relative risk; snus vs cigarettes


Huge risk-difference
The Bullshit Asymmetry Principle

The amount of energy needed to refute bullshit is an order of magnitude bigger than produce it.
Range of responses from tobacco control community

“Oh, that’s bad, let’s correct the misconceptions”
Range of responses from tobacco control community

- Suspicion of sender
- Denial
- Silence
- So what?

“Oh, that’s bad, let’s correct the misconceptions”
Range of responses from tobacco control community

Suspicion of sender
Denial
Silence
So what?

But, downgrading of risk may lead to use among non-smokers

“Oh, that’s bad, let’s correct the misconceptions”
E-cigarettes are not risk-free, and may be addictive. Compared to tobacco cigarettes, the risk from e-cigarettes is much lower. E-cigarettes might be an option to smokers who fail to quit smoking.
Take-home message:
• Widespread misconceptions on risk difference
• Caused by (mis-)information from the media and health authorities
• Willingness to correct misconceptions is modest
• Current working conditions for researchers: “The Bullshit Asymmetry Principle”
Conflict of interest:

- KEL is employed by a Government entity answerable to the Ministry of Health and Care Services

- KEL has no ties to pharmaceutical or tobacco industry

E-mail: kelu@fhi.no