Electronic cigarette use among high school students in Quebec

Annie Montreuil
Institut national de santé publique du Québec
January 27, 2015, webinar organized by the New Brunswick Anti-Tobacco Coalition
Conflict of interest disclosure

- No affiliation, financial interest or interest of any kind with a commercial company
- No remuneration, fees or research grants received from a commercial company
Acknowledgements

- Benoît Lasnier, INSPQ, Co-author
- Michèle Tremblay, INSPQ, Collaborator
- Réal Morin, Johanne Laguë, Christine Stich, Catherine Gannon, INSPQ
- Canadian Cancer Society – Quebec Division
- Ministère de la Santé et des Services sociaux du Québec (Ministry of Health and Social Services of Quebec)
- Propel Center for Population Health Impact, University of Waterloo
- Health Canada
Outline

• Background
• Objectives of the Study
• Data Sources and Variables
• Results
• Discussion

Background
Major investment in tobacco control in the last 15 years in Quebec

- Important increase in budget and human resources from 1998 to 2014
- Annual media campaigns
- Prevention programs

TOBACCO MAKES ITS VICTIMS SUFFER
BEFORE IT KILLS THEM
Comprehensive interventions to promote smoking cessation

• Reimbursement for cessation medication by public and private health insurance since 2000
• Mobilization of health professionals to optimize counseling practices (activities and training tools)
• Free smoking cessation services
  • iQuitnow helpline
  • iQuitnow website (adult and teenager versions)
  • Quit Smoking Centers (~160)
  • SMAT - Text messaging service for smoking cessation

Tremblay, M. (2013, mai). Les adolescents et l’usage de tabac... Présentation orale à l’atelier Strengthening the links between research, practice and policy to reduce the burden of smoking in youth, Montréal.

- Indoor smoking bans in public locations and workplaces
- Smoking ban within 9 meters of specific locations (colleges, universities, health facilities, etc.)
- Sponsorship bans
- Bans of direct and indirect advertising

Tremblay, M. (2013, mai). Les adolescents et l’usage de tabac... Présentation orale à l’atelier *Strengthening the links between research, practice and policy to reduce the burden of smoking in youth*, Montréal.
Restrictive Legislation ... that limits youth access to tobacco

- Smoking bans on school grounds
- Prohibited to supply minors with tobacco in school buildings or on school grounds
- Decrease in number of locations selling tobacco: 19,500 to 7,500
- Ban on displaying tobacco products by vendors (2008)
- Tax increase on tobacco products (2012, 2014)

Tremblay, M. (2013, mai). Les adolescents et l’usage de tabac... Présentation orale à l’atelier Strengthening the links between research, practice and policy to reduce the burden of smoking in youth, Montréal.
Cigarette smoking among high school students is declining

Source: Youth Smoking Survey, 2006-2007 à 2012-2013

Smoking of cigars / cigarillos among high school students is declining

Source: Youth Smoking Survey, 2006-2007 à 2012-2013

A new product hits the market: Electronic Cigarette (or e-cig)

- A new device that mimics the gesture and feeling of smoking
- Contains a liquid cartridge, an atomizer, a battery and a microprocessor
- Does not contain tobacco; a liquid solution is heated which then produces an aerosol
  - Main ingredients: propylene glycol and glycerol
  - Liquid may or may not contain nicotine
- Disposable or reusable/refillable
Use of e-cig by youth in schools

- Appeared on the Quebec market in 2011
  - February 2012: school principals began to report the use of e-cig by students inside school
- E-cig is not subject to the Tobacco Act
  - With nicotine: falls under the Food and Drugs Act (requires authorization from Health Canada)
  - Without nicotine: consumer product
- Widely available, in specialty shops and on the Internet
A less harmful alternative for smokers

- Scientific evidence suggests lesser toxicity of e-liquid and vapor than tobacco cigarette
- Little is know about long-term health effects
  - Repeated deep inhalation of propylene glycol
- Many smokers and healthcare providers report e-cigs are helpful in quitting smoking but efficacy as a cessation device is lacking scientific evidence

(Callahan-Lyon, 2014; Farsalinos & Polosa, 2014; Franck et al., 2014; Grana et al., 2014; Hajek et al., 2014; McRobbie et al., 2014; Poirier, 2013)
A gateway to smoking for youth?

- No evidence yet to support or disconfirm this risk
- Arouses curiosity among youth
- Technology and flavors are attractive to youth
- Possible use of illicit psychoactive substances (marijuana, other drugs)

(Bunnell et al., 2014; Durmowicz, 2014; Hajek et al., 2014; Grana et al., 2014)
Different reasons youth try e-cigs

- To quit or reduce consumption of tobacco products
- Because of lower long-term costs in comparison to smoking
- To avoid exposing others to tobacco smoke
- For fun/pleasure
- Because of curiosity

(Czoli et al, 2014; Société canadienne du cancer-Division Québec, 2013)
E-cig use among youth is on the rise

- United States, 12-19 years old (2011 to 2012)
  - Ever use: 4% to 7%
  - Use in past 30 days: 1% to 2%
- Poland, 15-19 years old (2010-11 to 2013-14)
  - Ever use: 6% to 62%
  - Use in past 30 days: 5% to 30%
  - Use of cigarettes in past 30 days: 24% to 38%
  - Polish context:
    - Earlier implementation of e-cig on the market; aggressive advertisement; less comprehensive tobacco control policy

(Corey et al., 2014; Goniewicz et al., 2014)
Data is limited for estimating the use of e-cig among Canadian youth

- **Canada, 16-30 years old (2012)**
  - Ever use: **16%**
  - Use in past 30 days: **6%**

- **Ontario, high school students (2013)**
  - Ever use: **15%**

- **Québec, 15-19 years old (2013)**
  - Ever use: **35%**

(Czoli et al., 2014; Hamilton et al, 2014; document interne, Institut de la statistique du Québec, 2014)
Objectives of the study

- Assess awareness, ever use, and use of e-cig in past 30 days among high school students in Quebec
- Assess association between use of e-cig, and use of alcohol and marijuana
- Assess susceptibility to use e-cig in the future
Data source and variables
The Youth Smoking Survey (YSS), 2012-2013

- Survey conducted across Canada
- 1994, 2002, every 2 years since 2004
- Data collected in schools
- Paper questionnaires completed by students in class
- Students in grades 6-11 (Secondary 5) in Quebec, grades 6-12 in the other provinces
- Provides cross-Canada and provincial representation
- n= 6 158 students in Quebec and 47 203 students Canada-wide
An insert on e-cig

- Added to the 2012-2013 YSS questionnaire in Quebec
- Funded by the Quebec Division of the Canadian Cancer Society
- Complimentary to YSS data
- n= 5 880 Quebec students completed the e-cig insert
Variables

- Awareness of e-cig
- Ever use of e-cig
- Use of e-cig in past 30 days
- Susceptibility to use e-cig in the future
- Ever use of cigarettes
- Use of cigarettes in past 30 days
- Susceptibility to smoke cigarettes in the future
- Ever use of flavoured tobacco products
- Alcohol and marijuana use (past 12 months)
Results
Most students are aware of e-cig

Students who have heard of e-cig

<table>
<thead>
<tr>
<th>Grade</th>
<th>High school students</th>
<th>Boys (h.s.)</th>
<th>Girls (h.s.)</th>
<th>grade 6</th>
<th>grade 7</th>
<th>grade 8</th>
<th>grade 9</th>
<th>grade 10</th>
<th>grade 11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>83</td>
<td>86</td>
<td>80</td>
<td>55</td>
<td>77</td>
<td>84</td>
<td>84</td>
<td>83</td>
<td>88</td>
</tr>
</tbody>
</table>

Source: Youth Smoking Survey 2012-2013
1 in 3 high school students report ever using e-cig: 143,300 students

Students who report ever using e-cig

<table>
<thead>
<tr>
<th>Grade</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 6</td>
<td>9</td>
</tr>
<tr>
<td>Grade 7</td>
<td>22</td>
</tr>
<tr>
<td>Grade 8</td>
<td>35</td>
</tr>
<tr>
<td>Grade 9</td>
<td>36</td>
</tr>
<tr>
<td>Grade 10</td>
<td>38</td>
</tr>
<tr>
<td>Grade 11</td>
<td>41</td>
</tr>
</tbody>
</table>

Source: Youth Smoking Survey 2012-2013
6% of students used an e-cig past 30 days: 24,100 students

Use of e-cig in past 30 days

Source: Youth Smoking Survey 2012-2013

CV between 16.6% and 33.3%, use with caution
Ever use of e-cig more prevalent among certain students

- 76% of students who ever smoked a whole cigarette
- 76% of students who ever used flavoured tobacco product
- 75% of students who smoked marijuana (past 12 months)
- 55% of students who report an episode of binge drinking (past 12 months)
- These students also more likely to report e-cig use in past 30 days
- Similar findings have been reported in the United States and in France (Corey et al., 2014; Dautzenberg et al., 2013)
Ever use among never smokers is not marginal

Among high school students who have never taken a puff from a cigarette

• 18% report ever using e-cig
• 2% report using e-cig in past 30 days
Susceptibility to try e-cig in the future

- 31% high school students who never used e-cig do not exclude the possibility of trying it in the future
  - 84,400 students

Based on a combination of responses to the two following questions:

1. If one of your best friends was to offer you an electronic cigarette (or e-cigarette), would you smoke it?
2. At any time during the next year do you think you will use an electronic cigarette (or e-cigarette)?

Response choices:
- Definitely yes
- Probably yes
- Probably not
- Definitely not - Does not exclude the possibility of trying e-cig in the future
- Excludes the possibility of trying e-cig in the future
Among lifetime never smokers/never puffers

- 46% of students who have used e-cig do not exclude the possibility of trying a tobacco cigarette in the future
  - 21,800 students
- 25% of students who have never used e-cig do not exclude the possibility of trying a tobacco cigarette in the future
- These findings are very similar to those obtained with U.S. students in 2013 (Bunnell, Israel, Apelberg, Caraballo, King, Arrazola et al., 2014)
Discussion
Interest in e-cig is widespread among high school students in Quebec

<table>
<thead>
<tr>
<th></th>
<th>YSS insert 2012-2013</th>
<th>ETADJES 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever e-cig use</td>
<td>34%</td>
<td>28%</td>
</tr>
<tr>
<td>Use of e-cig in past 30 days</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Ever e-cig use among never cigarette smokers</td>
<td>18%</td>
<td>20%</td>
</tr>
</tbody>
</table>

ETADJES 2013: Enquête québécoise sur le tabac, l’alcool, la drogue et le jeu chez les élèves du secondaire, 2013

- These rates are higher than those found in the U.S. and in France (Corey et al., 2014; Dautzenberg et al., 2013)
- Ever use: 7-8 % in the U.S and in France (2012) compared to 34% in Québec (2012-13)
Some students are more likely than other to use e-cig

- Ever use and use in past 30 days more prevalent among:
  - Male students
  - Students who smoked cigarettes (tobacco) and used flavoured tobacco products
  - Students who drank alcohol (12 months)
  - Students who report binge drinking (12 months)
  - Students who smoked marijuana (12 months)
More students could try e-cig in the future

- One third of high school students who never used e-cig do not exclude the possibility to try it in the future
- Susceptibility to smoke cigarette is higher among ever users of e-cig compared with never users
- These results do not confirm nor infirm the gateway hypothesis; non-smokers interested in smoking cigarettes could start by trying e-cig
Study limitations

- Questions do not specify if e-cigs contain nicotine or not
- These findings exclude youth:
  - who do not attend school, who attend a non-regular program or special schools
  - who have been institutionalized
  - who live on a First Nations reserve
The e-cig market is booming

- E-cig design is moving away from mimicking the look of the traditional cigarette and allow customers to personalize their e-cig (Zhu et al., 2014)
- Explosion of brands (466 in January 2014) and flavours (> 7000 listed on the Internet) (Zhu et al., 2014)
- Young people perceive flavoured products as being more pleasant and less harmful than non-flavored products, this is particularly true of high-sensation seekers (Manning et al., 2009)
- Youth and young adults in the US are largely exposed to advertisement of e-cig on television (Duke et al., 2014)
American advertisements promoting e-cigs
Cigarette électronique

Les spécialistes sonnent l’alarme

Sarah St-Denis – De plus en plus populaire, la cigarette électronique demeure un produit potentiellement dangereux disent les experts.

Il y a quatre ou cinq ans maintenant, un nouveau produit faisait son apparition sur le marché. Vendue majoritairement dans les dépanneurs de la province, la cigarette électronique a vu récemment son nombre d’acheteurs augmenter. Bien que seule la version de la cigarette électronique ne contenant pas de nicotine soit légale au Canada, sa vente ne bénéficie d’aucun encadrement du gouvernement.

Depuis les dix-huit derniers mois environ, la majorité des grandes compagnies de tabac ont racheté des fabricants de cigarettes électroniques et ont... Accès, 5 février 2014, page 12

Effet contraire
La Direction de santé publique également que ce nouvel engouement vient contre la lutte au tabagisme.

Un danger, quoi qu’en dise la santé publique

«Aucun danger, quoi qu’en dise la santé publique» - Le Dr Gaston Ostiguy

Le Dr Gaston Ostiguy du Centre universitaire de santé McGill, figure parmi les plus ardents défenseurs de la cigarette électronique dans le milieu médical, particulièrement sur la question de l’arrêt tabagique.

Essayer de bannir la cigarette électronique, c’est un peu comme Don Quichotte qui se bat contre les moulins à vent. Celles avec nicotine, interdites au Québec, ne posent aucun danger; quant à celles sans nicotine, elles contiennent des composés toxiques. Les cigarettes électroniques sont légales en Europe.

Leur popularité, par ailleurs, n’en finit pas de croître sur le Vieux Continent... Le Réveil, 11 février 2014, page 2
Point of consensus: prohibiting e-cig access to youth

- A consensus is emerging that e-cigs should be prohibited for youth under the age of 18, and that advertising, promotion and display must be overseen accordingly.
- The Minister for Public Health has expressed her intention to revise the Tobacco Act and to include terms that limit youth access to e-cigs.
- Pending revisions to the Act, certain institutions are taking the initiative to ban the use of e-cigs (school boards, colleges and universities, public transport).
Thank you for your time and attention.

annie.montreuil@inbpq.qc.ca