The student and school neighbourhood characteristics associated with smoking susceptibility among secondary school students (grades 9 to 12) in Canada
Background

Tobacco kills >6 million people each year.*

Tobacco is still the leading cause of preventable morbidity and death in Canada.
  ◦ 37,000 deaths each year
  ◦ 2 school bus loads (100 deaths) each day

Problem: Teens hooked before understanding consequences
  ▸ In New Brunswick: Among grade 12 students who had tried smoking, smoked first whole cigarette by 14 years.

*WHO, 2014
Prevalence of Canadian adolescent tobacco use (2008/09 YSS/CSTADS)

- Never Smoker, 54%
- Susceptible, 29%
- Non-susceptible, 71%
- Current smoker, 12%
- Experimental smoker, 7%
- Puffer, 15%
- Past experimenter, 10%
- Former smoker, 2%
Prevalence of Canadian adolescent tobacco use (2012/13 YSS/CSTADS)

Susceptible, 30%
Non-susceptible, 70%

Current smoker, 8%
Experimental smoker, 5%
Puffer, 14%
Past experimenter, 10%
Never Smoker, 63%
Smoking prevalence among youth from New Brunswick (NBSWS 2012/13)

- Ever tried smoking: 27%
- Not susceptible: 76%
- Never tried smoking: 73%
- Susceptible: 24%
Why should we be concerned about adolescents?

- Research shows that 88% of established regular adult smokers initiated smoking during their teenage years (by age 18).

- Tobacco industry exploits the teen “identity crisis” stage by sponsoring attractive advertisements (“cool”, “sporty”, “risky”).
Adolescent smoking behaviour consists of distinct smoking stages.

Can categorize teens into 3–6 smoking stages*:

- Being a non-smoker (not susceptible)
- Non-smoker (susceptible)
- Trying smoking
- Experimenter
- Becoming a regular & established smoker

Public health priority to prevent smoking initiation and disrupt progression beyond initial use.

*Mayhew et al. (2000)
Chassin et al. (2009)
To examine which **school** and **student**–level characteristics differentiate susceptible never smokers from non–susceptible never smokers among a nationally representative sample of Canadian students in grades 9–12.
Smoking susceptibility has been found to be a strong predictor of experimental smoking.*

Understanding the factors that differentiate a susceptible never smoker from a non-susceptible never smoker is critical in shaping future tobacco control programs that will dissuade students who are never smokers from initiating smoking.

Why concerned about youth who are susceptible to smoking?

- Susceptible youth are more vulnerable to personal, social and environmental influences that encourage them to experiment with tobacco.

- They are also vulnerable to tobacco marketing strategies and pro-smoking messages compared to youth who are not susceptible to smoking.

*Unger et al, 1998*
LITERATURE REVIEW
THE BASICS OF THE THEORY OF TRIADIC INFLUENCE

*Flay & Petratis, 1994; Flay et al, 1999

susceptible never smoker
Factors related to smoking susceptibility

**Intrapersonal /Student factors**
- Being younger,
- Lower grade,
- Positive attitudes towards smoking,
- Consuming alcohol/drugs
- Low self-esteem

**Social Context**
Friends/family who smoke
No smoking bans at home

**Family/Friends**

**School-level factors**
- Density of tobacco retailers
- Student smoking in periphery of school
- School with her prevalence of tobacco use

**Neighbourhood**

**Basic personality and biological make up**

**GENETICS**
Gaps in knowledge on susceptibility

What is the influence of:

- School location (rural versus urban)?
- Socioeconomic status (SES) of the neighbourhood surrounding a school?
- Density of tobacco retailers surrounding a school?
METHODS
Sample

- 29,296 Canadian secondary youth (Grade 9–12) from the 2008/2009 Youth Smoking Survey (YSS/CSTADS) data. 133 Secondary schools.

- YSS/CSTADS is a machine-readable, pencil and paper nationally representative school-based survey used to measure the determinants of youth smoking behaviour.
Parental consent was required for student participation.
Administered during 1 class period.
Survey tools took 30–40 minutes.
Ensure confidentiality—no names, envelopes sealed and put in larger classroom envelope.
Linked data files

- 2008/09 YSS/CSTADS data set.

- 2006 Census data set.
  - Rural/Urban location.
  - SES status of the neighbourhood in which schools were located.

  - Tobacco retailers within a 1–km radius of each school.
**Student Intrapersonal Factors**
gender, age, attitudes, substance use and self-esteem

**Student Social Context Factors**
Peers and family who smoke and home smoking rules

**School Factors**
SES, location and density of tobacco retailers

**Outcome**
susceptible never smoker

*Flay & Petrakis, 1994; Flay et al, 1999*
"Never Smoker"
- Never smoked a cigarette, not even a puff.

"Susceptible never smoker" *
Never smoked (not even a puff)
- Answered "Definitely not" to:
  1. do you think in the future you might try smoking cigarettes?
  2. if any of your best friends were to offer you a cigarette, would you smoke it?
  3. at any time during the next year, do you think you will smoke a cigarette?

*Pierce et al., 1996
Statistical analyses

1. Descriptive statistics for total sample & sub-sample (of susceptible non-smokers).

2. Bivariate and multivariate analysis.

RESULTS
Student–level Findings
1. 51% of the sample were male, 49% female.

2. The prevalence of susceptible never smokers was not different by gender.

3. Prevalence was different by grade – with students from the lower grades having a higher prevalence of susceptible never smokers.
1. The average prevalence of susceptible never smokers within a school was 28% (range 0% to 58%).

2. 69 out of 133 secondary schools were located in urban areas.

3. Mean number of tobacco retailers within a 1–km radius of each secondary school was about 6 (SD 10 and range was 0 to 49).
Result #1: Susceptibility to smoking among Never Smokers

- All 100%
  - Never Smokers (55%)
  - Ever Smokers (45%)
  - Susceptible (29%)
  - Not Susceptible (71%)
Implication #1: Susceptibility

If $\frac{1}{3}$ of never smokers are susceptible to smoking in the future.

- We still need tobacco use prevention programs, in spite of declining prevalence in Canada.
Result #2: What Student intrapersonal factors are linked to susceptibility?

- Low self-esteem.
- Holding positive attitudes towards smoking.
- Using alcohol or marijuana.
Implications #2: Intrapersonal factors related to susceptibility

- Need to target never smokers with low self-esteem, who feel positive about tobacco or use alcohol or marijuana.

- Need to emphasize comprehensive multifaceted strategies that target multiple factors to improve students' self-esteem, increase knowledge regarding harms of tobacco use and resist substance use. A good example is the New Brunswick Student Wellness Strategy.
Result #3: What student social context factors are linked to susceptibility?

- Having close friends who smoked.
- Coming from homes without a total ban on smoking.
Implications #3: Social context factors related to susceptibility

- Ensure students have skills to resist direct and indirect pressures from peers who smoke.

- Also target smoking peers and home smoking rules.
School-level Findings
Result #4: School–level factors related to susceptibility

- The Multi–level analysis showed that the percentage of susceptible never smokers varies between schools.

- This means that the school a student attends is related to the likelihood of a never smoker becoming susceptible to smoking.
Implication #4a: School-level factors related to susceptibility contd...

- Important to consider school characteristics beyond/plus individual characteristics to paint a clear picture of susceptibility (multi-level analysis encouraged).
While we know schools influence susceptibility, we need further information (research) to understand what about them makes a difference.
Result #5: School-level factors related to susceptibility contd...

Contrary to other research,

- Retailer density,
- Socio-economic status of neighbourhood,
- Rural/Urban location,

were not linked to smoking susceptibility.
Implication #5: School–level factors related to susceptibility contd...

While we know that the 3 school factors we tested were not related to susceptibility,

- We need to explore and evaluate other types of school–level data (e.g. school based tobacco control programs/policies). This would help shed light on the unexplained variability.
Best practices guidelines on smoking prevention recommend comprehensive or multi-pronged approach* including:

- school-based programs and/or policies,
- mass media counter-advertising,
- community-based strategies,
- tax policies,
- smoke-free environments,
- cessation and tobacco industry denormalization.

*CDC, 2007
Strengths of the study

- Provides nationally representative evidence of the importance of multi-level factors for Canadian adolescent smoking behaviors.
- Examines the factors among adolescents in different smoking stages.
- Guided by a relevant theory TTI.
- Uses an appropriate analysis method (Multi-level logistic regression) that captures other factors beyond the individual.
Potential study limitations

- YSS and Census data are cross-sectional.
- Use of secondary data limits one on what variables to use.
- Use of Census data as the only proxy measure for school SES.
- There is no information on the reliability and validity of the DMTI–EPOI data.
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Any Questions?
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