

## School-based smoking prevention curricula: Evidence and implications for public health

### Review on which this evidence summary is based:

Thomas, R. E., McLellan, J., & Perera, R. (2015). Effectiveness of school-based smoking prevention curricula: Systematic review and meta-analysis. *BMJ Open*, 5(3).

### Review Focus

- P** Children and adolescents who have never smoked (aged 5 to 18)
- I** School-based prevention curricula (information, social influences, social competence, combined social influences/competence and multimodal curricula) intended to deter tobacco use among children and adolescents
- C** No curriculum, usual practice, information and homework, physician talk on smoking (if requested), or mailed booklets on changes in adolescents
- O** Continuing to be a never-smoker at follow-up

**Review Quality Rating:** 8 (strong) *Details on the methodological quality are available [here](#).*

### Considerations for Public Health Practice

#### Conclusions from Health Evidence

This is a review and meta-analysis of 50 randomized controlled trials (RCTs) mostly at low or unclear risk of bias. There were a total of 143,495 participants included in the trials, all of whom were never-smokers between the ages of 5-18.

Five different types of curricula were examined in the trials: 1) information only curricula; 2) social competence curricula; 3) social influence curricula; 4) combined social competence and social influences curricula; and 5) multimodal curricula. Some trials included 'other' interventions, such as school-wide antismoking policies, motivations to smoke, classroom good behaviour.

At follow-up greater than 1 year, there was a **statistically significant effect** that favoured all curricula in comparison to the control groups, leading to a 12% decline in the onset of smoking. Statistically significant curriculum types at the longest follow-up were social competence curricula and the combined social competence/social influence curricula.

**No overall effect** was found for all of the school-based curricula with a follow-up of 1 year or less. Of these trials, only the combined social competence/social influences curricula had a significant effect.

Social influences, information only and multimodal curricula had **no effect** on smoking prevention.

Regardless of length, school-based curricula deterred female children/adolescents from smoking, but had no effect on males. Adult-led curricula implemented for longer than a year had a significant effect on smoking prevention, whereas peer-led programmes did not.

Multifocal social competence and multifocal combined social competence/influence curricula lasting longer than a year had a significant effect. There was an effect for tobacco only

#### General Implications

##### Public health programs should encourage:

- School-based smoking prevention curricula that use social competence and combined social competence/social influence curricula lasting longer than a year
- Adult-led smoking prevention curricula
- Social competence and combined social competence/influence curricula lasting longer than a year
- Curricula lasting over a year with or without booster sessions

##### Public health programs should not encourage:

- School-based smoking prevention using information only, social influences alone or multimodal curricula
- Peer-led smoking prevention curricula
- Curricula with 1 year or less follow-up, with the exception of combined social competence and social influences
- Booster sessions after the main curriculum with follow-up of one year or less
- Tobacco only curricula implemented for 1 year or less

##### Strengths/limitations of this study:

- There was low heterogeneity between the trials and consistent results after sensitivity analyses. For this podcast we reported the 50 trials of baseline never-smokers.
- However, many trials did not report outcomes on cohorts of baseline never-smokers, but reported change data between two time points or point

curricula when implemented for over a year, but no effect  $\leq 1$  year. Lastly, booster sessions after main curriculum had no effect when implemented for one year or less, but did have a positive effect when implemented after combined social competence/social influences curricula with follow up greater than one year.

prevalence data (mixing never-smokers, experimenters and triers), which were not meta-analysable.

## Evidence and Implications

*Evidence points are not in order of the strength of the evidence.*

What's the evidence?*	Implications for practice and policy
<p><b>Social curricula greater than 1 year follow-up</b> (50 trials, 74 curriculum arms)</p> <ul style="list-style-type: none"> <li>Overall, school curricula with 1 year or longer follow-up had a <u>statistically significant effect</u> on smoking prevention (OR 0.88, 95% CI 0.82 to 0.95; <math>I^2=12\%</math>)</li> <li>Social competence curricula (5 trials/7 arms) had a <u>statistically significant effect</u> on smoking prevention in comparison to control groups (OR 0.65, 95% CI 0.43 to 0.96, <math>I^2=0\%</math>)</li> <li>Combined social competence/social influence curricula (9 trials/11 arms) also had a <u>statistically significant effect</u> on smoking prevention (OR 0.60, 95% CI 0.43 to 0.83, <math>I^2=0\%</math>)</li> <li><u>No impact</u> for information only curricula, social influences curricula and multimodal programmes</li> <li>Other interventions (school-wide antismoking policies, motivations to smoke, classroom good behaviour) also had <u>no impact</u></li> </ul>	<p><b>Social curricula greater than 1 year follow-up</b></p> <ul style="list-style-type: none"> <li>Public Health should support the implementation of school-based prevention curricula with follow-up longer than a year to deter tobacco use among children and adolescents. Specifically, interventions should focus on social competence and combined social competence/social influences curricula.</li> </ul>
<p><b>School-based curricula 1 year or less in follow-up</b> (26 trials, 41 curriculum arms)</p> <ul style="list-style-type: none"> <li>School curricula with follow-up 1 year or less had <u>no overall effect</u> (OR 0.91, 95% CI 0.82 to 1.01; <math>I^2=19\%</math>)</li> <li>The only curriculum in this group that showed a <u>statistically significant effect</u> in preventing the onset of smoking was the combined social competence/social influences curricula (7 C-RCTs; OR 0.59, 95% CI 0.41 to 0.85; <math>I^2=0\%</math>)</li> <li><u>No impact</u> for social influences curricula (16 RCTs), information only curricula (1 small trial), and the multimodal curricula (3 RCTs)</li> <li>No RCT tested a social competence curricula versus control with follow-up of 1 year or less</li> </ul>	<p><b>School-based curricula 1 year or less in follow-up</b></p> <ul style="list-style-type: none"> <li>Public Health should not implement school-based smoking prevention curricula with 1 year or less follow-up, with the exception of combined social competence/social influences curricula.</li> </ul>
<p><b>Subgroup Analysis – Gender</b></p> <ul style="list-style-type: none"> <li>For the small number of trials that included data by gender at 1 year follow-up, there was a <u>statistically significant effect</u> for females (5 trials/ 7 arms; OR 0.68, 95 % CI 0.50 to 0.93; <math>I^2=0\%</math>). There was <u>no significant effect</u> for males (4 trials).</li> <li>At follow-up greater than 1 year, there was again a <u>statistically significant effect</u> for females (7 trials/ 9 arms; OR 0.80, 95% CI 0.66 to 0.97) and <u>no significant effect</u> for males (6 trials)</li> </ul>	<p><b>Gender</b></p> <ul style="list-style-type: none"> <li>School-based curricula, regardless of length, are effective in deterring female children/adolescents from smoking. They are not however, effective at deterring male children/adolescents from smoking. Public Health should consider other school-based smoking prevention interventions that target males.</li> </ul>

<p><b>Subgroup Analysis – Adult-led vs. Peer-led</b></p> <ul style="list-style-type: none"> <li>• Adult-led curricula with follow-up of 1 year or less (21 trials/ 30 arms) had <u>no significant effects</u>, with the exception of combined social competence/social influences curricula (OR 0.58; 95% CI 0.40 to 0.85; I<sup>2</sup>=0%). Peer-led curricula (6 trials/ 8 arms) had <u>no overall effect</u> in comparison to controls in follow-up of 1 year or less</li> <li>• At follow-up greater than 1 year, adult-led curricula had <u>significant overall effects</u> (42 trials/ 57 arms; OR 0.87, 95% CI 0.81 to 0.94; I<sup>2</sup>=23%). There were <u>significant effects</u> for adult-led social competence curricula (5 trials/ 7 arms; OR 0.62, 95% CI 0.40 to 0.96; I<sup>2</sup>=0%) and for combined social competence/social influences (7 trials/8 arms; OR 0.58, 95% CI 0.42 to 0.82; I<sup>2</sup>=0%). <u>No effect</u> was found for adult-led social influences or multimodal curricula at follow-up greater than 1 year</li> <li>• <u>No overall impact</u> for peer-led programmes greater than 1 year (8 trials/ 11 arms) compared with controls.</li> </ul>	<p><b>Adult-led vs. Peer-led</b></p> <ul style="list-style-type: none"> <li>• Public Health should support the implementation of adult-led social competence curriculums that are longer than a year. Combined social competence/social influences curriculums at any length time should also be supported. Peer-led curricula should not be implemented.</li> </ul>
<p><b>Subgroup Analysis – Tobacco only vs. multifocal curricula</b></p> <ul style="list-style-type: none"> <li>• <u>No overall effect</u> for multifocal curricula compared with control, regardless of length. A <u>significant effect</u> was found at follow-up greater than 1 year for multifocal social competence curricula (5 trials/7 arms; OR 0.65, 95% CI 0.43 to 0.96; I<sup>2</sup>=0%) and for multifocal combined social competence/influences (5 trials/6 arms; OR 0.53, 95% CI 0.34 to 0.83; I<sup>2</sup>=0%)</li> <li>• Curricula that focused on tobacco only (16 trials/27 arms) had <u>no effect</u> for follow-up ≤1 year. There was an effect for tobacco only curricula at follow up over a year (28 trials/43 arms; OR 0.89, 95% CI 0.81 to 0.97; I<sup>2</sup>=24%)</li> <li>• <u>No effect</u> for multifocal, social influences or combined social competence/social influences curricula compared with control at any length.</li> </ul>	<p><b>Tobacco only vs. multifocal curricula</b></p> <ul style="list-style-type: none"> <li>• Multifocal social competence and multifocal combined social competence/influences curricula lasting longer than a year should be supported by Public Health. Curricula focusing on tobacco only should not be implemented for a year or less.</li> </ul>
<p><b>Subgroup Analysis – Adding booster sessions after main curriculum</b></p> <ul style="list-style-type: none"> <li>• <u>Significant effect</u> for curricula without booster sessions at longest follow up (45 trials/67 arms; OR 0.90, 95% CI 0.83 to 0.96; I<sup>2</sup>=10%), but <u>no effect</u> for curricula without booster sessions at follow-up 1 year or less (24 trials) compared with controls</li> <li>• <u>Significant effect</u> for all curricula with booster sessions at follow-up greater than 1 year (6 trials/7 arms; OR 0.73, 95% CI 0.55 to 0.97; I<sup>2</sup>=21%) compared with controls, but <u>no effect</u> for curricula with booster sessions 1 year or less (3 trials).</li> <li>• <u>Positive effect</u> for combined social competence/social influences curricula at follow-up ≤1 year with booster sessions (2 trials; OR 0.50, 95% CI 0.26 to 0.96; I<sup>2</sup>=0%). Also a positive effect for this curricula with booster sessions at follow up greater than one year (3 trials; OR 0.56, 95% CI 0.33 to 0.96; I<sup>2</sup>=0%).</li> </ul>	<p><b>Adding booster sessions after main curriculum</b></p> <ul style="list-style-type: none"> <li>• Public Health does not need to add booster sessions after the main curriculum with one year or less follow-up. Booster sessions after the main curriculum of combined social competence/social influences implemented longer than a year may be effective.</li> </ul>

**Legend:** P – Population; I – Intervention; C – Comparison group; O – Outcomes; OR – Odds Ratio; CI – Confidence Interval \*For definitions please see the [healthevidence.org glossary](http://healthevidence.org/glossary) [www.healthevidence.org/glossary.aspx](http://www.healthevidence.org/glossary.aspx)

**\*\* Note:** Only the primary outcomes from each study are addressed in this evidence table.

## Why this issue is of interest to public health in Canada

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Most cigarette smokers begin using tobacco products before the age of 18, which can have long lasting health effects.<sup>1</sup> Smoking is linked to an increased risk of many diseases, cancers, and respiratory infections.<sup>2</sup> Canadian youth who smoke are more likely to make use of illicit drugs and alcohol in comparison to youth and adults who do not smoke.<sup>2</sup> Use of cigarettes, illicit drugs, or alcohol can be linked to both mental and physical health issues.<sup>2</sup> Though there has been a decline in the number of Canadian youth who smoke, the numbers remain significant.<sup>2</sup> The results of the Canadian Tobacco, Alcohol and Drugs Survey found that 11% of youth between the ages of 15 to 19 as well as 18% of older youth between the ages of 18 to 19 were current smokers in the year 2013.<sup>3</sup>

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<sup>1</sup> World Health Organization. (2015). *About youth and tobacco*. Retrieved from <http://www.who.int/tobacco/research/youth/about/en>

<sup>2</sup> Davis, C. G. (2006). *Risks associated with tobacco use in youth aged 15-19*. Retrieved from <http://www.ccsa.ca/Resource%20Library/ccsa-011346-2006.pdf>

<sup>3</sup> Statistics Canada. (2015). *Summary of results for 2013: Canadian tobacco, alcohol and drugs survey (CTADS)*. Retrieved from <http://healthy Canadians.gc.ca/science-research-sciences-recherches/data-donnees/ctads-ectad/summary-sommaire-2013-eng.php>

**Other quality reviews on this topic are available on [healthevidence.org](http://healthevidence.org)**

## Suggested citation

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Thomas, R.E., McLellan, J., Perera, R., Sully, E.P. & Dobbins, M. (2015). School-based smoking prevention curricula: Evidence and implications for public health. Hamilton, ON: McMaster University. Retrieved from [http://healthevidence.org/documents/byid/28703/Thomas2015\\_EvidenceSummary\\_EN.pdf](http://healthevidence.org/documents/byid/28703/Thomas2015_EvidenceSummary_EN.pdf).

*This evidence summary was written to condense the work of the authors of the review referenced on page one. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.*

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