

## EVIDENCE BRIEF

# Interventions to Improve Smoke-Free Vape-Free Compliance on School Property

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## Key Messages

- Based on a library-directed search strategy, there is limited evidence available to address school-based interventions that support smoking and/or vaping policy/legislation compliance on school property in the youth population (18 years and younger). Four relevant studies focused on cigarette smoking, with no studies available that focused on vaping.
- Compliance was not clearly defined across the included studies; however, there were reported changes to tobacco smoking on school property, but the extent of the behaviour changes was mixed. All studies acknowledged the importance of comprehensive strategies, intentional implementation, ongoing monitoring and enforcement to support compliance and overall policy effectiveness.

## Note on Terminology

Any reference to tobacco in this document refers to commercial use of tobacco, which is not associated with the sacred and traditional uses of tobacco, which Indigenous peoples have been using for thousands of years. Traditional or sacred tobacco differs from commercial tobacco both in the way that it is harvested and in the way it is used in ceremony and prayer, often for healing and purifying.

## Issue and Research Question

There have been issues and concerns with youth vaping on school property across Ontario. Effective interventions to reduce vaping on school property have not been identified. The Ministry of Education has responded to concerns with updated guidance and some additional resources to support school boards address vaping in schools.

The [\*Smoke-Free Ontario Act \(SFOA\), 2017\*](#) outlines restrictions around smoking and vaping, in indoor spaces, on outdoor grounds including playgrounds and fields, and within 20 metres of school property.<sup>1,2</sup> The [\*SFOA, 2017\*](#) legislation applies at all times to staff, students, parents, and visitors on school property, and includes parking lots, vehicles, and athletic fields. School staff and administration are charged with enforcing these regulations, with local public health units having a role in inspections and response to smoking and vaping complaints. Penalties, including charges and fines, can be issued for failing to comply with the *SFOA, 2017*.

School staff, students, parents and health officials have been very vocal over vaping concerns at schools.<sup>3,4</sup> School staff have also expressed challenges with attempting to manage use and reinforce compliance of smoking and vaping restrictions in schools. Media reports across the country have cited these concerns and strategies that staff are implementing to address these issues.<sup>3,6,7</sup> There were some Ontario schools that decided to explore additional supports to help manage compliance in and on school property, with the installation and implementation of vaping detectors in areas of the schools that were known to have the highest rates of non-compliance among students.<sup>8,9</sup>

The Ministry of Education issued [Policy/Program Memorandum 128 \(PPM 128\), The Provincial Code of Conduct and School Board Codes of Conduct](#) on June 25, 2024, to take effect as of September 1, 2024.<sup>10,11</sup> Through the release of this policy/program memorandum, the Ministry of Education acknowledged the concerns and challenges that schools are facing to prevent vaping on school property. In addition to added direction on how schools and school boards should be addressing vaping on school property in the upcoming school year, the Ministry also announced additional funding for school boards to purchase and install vape detectors.<sup>8,9</sup> Given that the development and use of vape detectors is a very new intervention, there is no available evidence of their effectiveness for schools at the time of writing (refer to [Evidence Brief Vape Detector Effectiveness for School Property](#)). Therefore, there was a need to explore what evidence was available to help inform school level interventions to support reducing use of vaping devices on school property.

This document summarizes the best available evidence for school-based interventions that support smoking and/or vaping policy/legislation compliance on school property in the youth population (18 years and younger), and the impact on compliance and improvement of compliance on school property. The primary purpose of this evidence brief is to answer the question: **What interventions support and/or improve compliance of smoke-free and/or vape-free policies on school property?**

## Methods

A rapid review was conducted to facilitate timely response for decision making, feasibility, and to keep the review question within scope.<sup>12</sup> PHO Library Services designed and executed scientific literature searches June 13, 2024, limiting the search to English language articles published 2015 to the present.

One PHO staff member screened titles and abstracts for relevance with the content lead validating inclusions in full-text. Sources were eligible for inclusion if they: were a primary study or review that evaluated school-based interventions aimed at supporting or improving compliance, and assessed compliance (success/effectiveness) in school-aged populations 18 years or younger. This may include legislative policy and outcomes measured in reduction of tickets/infractions, reduction in complaints, etc. Evaluation papers without compliance outcomes, or outcomes focused on prevalence or quit attempts were excluded. Lastly, sources published in English that provided results from Organization for Economic Co-operation and Development member countries were eligible.

One PHO staff member extracted relevant data. Two reviewers made independent assessments of quality and resolved uncertainties via discussion. Data extraction was done by one reviewer for each included paper with validation by the content lead.

# Main Findings

## Characteristics of Included Studies

Four papers published in the span of 2018–2023 met inclusion criteria for this synthesis; two were studies from The Netherlands with the same first author, two other papers were studies conducted in Denmark and Italy. Three of the four papers focused on adolescents 11–13,<sup>13-15</sup> and one paper included adolescents in a broader age range of 10–18.<sup>16</sup> All four of the included papers focused on tobacco smoking and did not explicitly use the term vaping; only one paper specified “conventional cigarettes” and another included e-cigarettes and water pipe use in addition to use of the term ‘smoking’.

Three of the four studies (in the Netherlands and Denmark) were started in advance of an incoming school grounds smoking ban, with the Danish ban involving *all* smoking during school hours, whether on *or off* school property, for completely ‘smoke-free school time’.<sup>14-16</sup> The fourth study published out of Italy was conducted in the environment of a broad and pre-existing smoke-free legislation aimed at decreasing second-hand smoke (SHS) exposure in public places to improve the health of non-smokers in Italy.<sup>13</sup> Rozema et al indicate that 23% of all adolescents (aged 12–16 years) in the Netherlands say they have smoked at least once in their lives. However, the included papers did not describe the social norms around smoking within the schools and focused only on school demographic reporting as part of these studies.

None of the papers defined compliance (and one paper did not use the term, but the concept was identified during screening so that paper was included). Compliance, in the ways it was operationalized, was not linked to smoking intention or ‘getting busted’ but linked to observations of smoking/vaping either by self-report (students) or by a school staff. Compliance was operationalized in the studies as smoking on and off school property **prevalence and frequency**,<sup>16</sup> **smoking prevalence, onset, and use of alternative tobacco products**<sup>15</sup>, and **frequency of smoking among students at different locations** (at, or just outside school premises, or in other places).<sup>14</sup> Smoking frequency was evaluated in categories (every school day; multiple times a week; seldom or never) with categories then dichotomized into 1=daily or weekly and 2=seldom or never.<sup>14</sup> Actual compliance was operationalized as perception of compliance of the smoking ban.<sup>13</sup> Only one paper failed to report smoking status at baseline for the sample.<sup>14</sup> The remainder did report whether the population studied use tobacco/vape at baseline.<sup>13,15,16</sup>

Only one paper among the four reported a potential co-intervention, describing a recent (January 2021) national law with several initiatives, i.e., higher tobacco prices, standardized tobacco packaging, and a ban on student smoking during school hours.<sup>14</sup> The study did not evaluate the impact of these potential co-interventions on outcomes. All four included papers were low in methodological quality. Time frames for the included studies ranged from 6 months<sup>16</sup> to a maximum of 3 years.<sup>14</sup>

## Findings Reported in the Included Studies

One study of schools that implemented outdoor school ground smoking bans reported a higher **probability to start smoking among students** over time compared to the schools that did not implement smoking bans ( $I^2 = 1.42$ , 95% BCI \* = 0.21-2.96).<sup>15</sup> In contrast, another study that looked at school ground bans on **smoking behaviour and location(s) for use**, found students reported smoking less on school property or just outside the school grounds in the surrounding community, declining from 22% at baseline to 16% three years later, and declining from 11% to 0% on school premises during school hours.<sup>14</sup> However, Kjeld (2023) also reported that students smoking at ‘other places’ during school hours increased from 13% at baseline to 22% at the last follow-up. A third study reported no significant interaction effects between time (6 months post implementation) and smoking policy on student smoking prevalence or student’s frequency of smoking as a result of smoking restrictions implemented on school property.<sup>16</sup>

The fourth study found significant differences between an individual that smokes tobacco versus one that does not smoke and their **perception of student and school staff smoking in the school environment** ( $p=0.001$ ).<sup>13</sup> More students who identified as smoking cigarettes themselves, stated that students and staff smoke in the (school) garden or courtyard, whereas fewer smoke-free students reported this.<sup>13</sup> This cross-sectional study suggests that when students witness others smoking in their school environment, that may influence their own risk for smoking, through social modeling.<sup>13</sup>

## Implementation Fidelity

Three of the four papers reported implementation fidelity; two described how it was operationalized and one presented fidelity measurements.<sup>14-16</sup> The third paper reported that smoking rules and enforcement increased over the time frame of the study (3 years), and smoking locations also changed over time (smoking behaviour moved off school property) but did not indicate that they measured implementation fidelity.<sup>14</sup> For all three papers reporting implementation fidelity and enforcement, relevant data were collected by school staff. We note that while school staff are likely in an ideal position to monitor and make observations, they may also have a vested interest in reporting strong enforcement/implementation fidelity. The included studies did not assess or report students' understanding of the consequences of non-compliance to the smoke-free school property policy. None of the studies clearly describe how and whether there was enforcement as part of the implementation.

## Equity Considerations

Equity was not an intended focus of the included studies. However, three of the four included papers considered equity via relevant demographic data for their respective participants.<sup>14-16</sup> For the three papers assessing some equity considerations, this was reported in terms of migration background and education level<sup>15,16</sup>, proportion of students identifying with ethnic minority groups, wealth of community (wealthy, on average, not wealthy) and type of school (public/private).<sup>14</sup> Backhaus et al (2021) did not explicitly address equity in their data collection or description of school and student-level data, yet they did speculate that socioeconomic status (SES) could have mediated their results.

## Limitations and Strengths

While we acknowledge external policies outside the school environment have impact, we only included school-level and school environment-focused policy. We did not locate any papers explicitly focused on vaping and instead they commented on policy toward smoking and smoking as an outcome. The four included papers did not describe in detail whether or how school restrictions were promoted, and whether or how they were or were not enforced. We acknowledge that the promotion and enforcement of any of these activities could impact the success of or compliance with policy.

Study time frames ranged from six months, to 16 months and 18 months, to the maximum time frame of three years, and authors suggest that shorter time frames (e.g., 6 months) may be too short to observe significant effects of an outdoor school ground smoking ban, particularly where bans were relatively recently implemented.<sup>16</sup> The study designs used may not have allowed for conclusions like increasing the probability of starting smoking. However despite limitations of the literature itself, this evidence brief is the result of a comprehensive search of published literature that was systematically reviewed and appraised, and represents the current best available evidence.

## Conclusion

The included papers did describe changes in enforcement over time. The study with the longest follow up of three years showed that enforcement only changed from about two thirds (68%) at baseline to three out of four (75%) at the end of the three-year period.<sup>14</sup> While rules became stricter, enforcement did not change dramatically, and smoking decreased on school property (but moved to other settings off school property instead).<sup>14</sup> However, none of the included studies clearly describe how and whether there was enforcement as part of the implementation.

In terms of implications, having school staff who are on site and can closely monitor fidelity and enforcement, as in these studies, may not be feasible in all situations. For example, in Ontario where public health units are called on to enforce the Smoke-Free Ontario Act, a health units' requirement is to complete one inspection per school year for each secondary school in their jurisdiction and respond to any complaints on school property or within the 20 metre perimeter of public areas outside school property. Any additional enforcement taking place is then based on compliance and or speciality programs established between the school board, school and the local health unit.

The role of the jurisdiction's policy environment, (e.g., programs in place) may also play a role in the success/compliance of any policy legislation. Success is more likely to occur in a jurisdiction that has smoke-free/vape-free policies in other areas of their communities, plus restrictions around advertising, minimum age of purchase, for example under the SFOA, display and promotion of vaping products is limited to speciality vape stores that are restricted to anyone under the age of 19.

These results therefore come with the provision that a single intervention like a policy/legislation is often not effective on its own, takes time to demonstrate success or is unable to see the impact at a population level. This highlights the importance of comprehensive strategies and programing in tobacco and vaping control work.

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