



**A pilot project to evaluate the 'CATCH My  
Breath' vaping prevention curriculum in Canada:  
Final Report**



**Canadian  
Cancer  
Society**

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## Executive Summary

Vaping has increased dramatically among youth in Canada. However, there is a lack of evidence for effective school-based prevention approaches targeting vaping, particularly for high school-aged students. The objectives of this pilot study were to 1) identify youth and presenter perceptions of the appeal, appropriateness, and comprehensiveness of the 'CATCH My Breath' (CMB) vaping prevention curriculum; 2) assess short-term changes in knowledge of and attitudes towards vaping after exposure to the curriculum; and 3) examine the feasibility of implementing CMB in high schools in Ontario, Canada.

A convenience sample of 10 high schools across Ontario implemented the CMB curriculum in 28 classes. CMB is an evidence-based vaping prevention curriculum developed in the US. Surveys were given to students before/after exposure to the curriculum to assess changes in vaping knowledge and attitudes. A subgroup of students participated in focus groups and curriculum presenters participated in interviews to provide feedback about the curriculum. Qualitative thematic analyses identified major themes from student focus groups and presenter interviews. McNemar's exact test assessed changes in knowledge and attitudes before/after curriculum delivery.

Curriculum presenters and students highlighted key aspects of the curriculum including the negative health risks of vaping, vaping industry tactics, the development of refusal skills, and engaging activities to keep student interest. While curriculum presenters and students generally thought that the curriculum was appealing, appropriate, and comprehensive, they offered some suggestions for improvement, including revising and adding content, and modifying activities. After exposure to the curriculum, the average knowledge score increased significantly from 5.5/9 to 7.5/9 ( $p < 0.001$ ). At follow-up, more students correctly identified that e-cigarette vapour does not contain mostly water (baseline: 38.5%, follow-up: 82.6%;  $p < 0.001$ ) and fewer students agreed that most people in high school vape (baseline: 83.8%, follow-up: 75.2%;  $p = 0.049$ ).

The 'CATCH My Breath' vaping prevention curriculum was easily delivered in high school classrooms in Ontario. Some modifications to the curriculum are necessary to make it appropriate for high school students. Future studies should evaluate the short- and long-term impacts of exposure to the curriculum on student vaping behaviours.

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# 1. Introduction

Vapes (also called e-cigarettes) have received increasing public attention as their use has increased dramatically among youth populations in Canada<sup>1,2</sup> and the US.<sup>2,3</sup> For example, between 2013 and 2018, the prevalence of current (past 30-day) vaping among Ontario high school students increased from 7.6% to 25.7%,<sup>1</sup> and nationally representative data suggest that the prevalence of current vaping among youth almost doubled between 2017 and 2018.<sup>2</sup> Additionally, almost one third of students are susceptible to (or at higher risk of) using vapes in the future.<sup>4-6</sup> Many students experiment with vaping during high school. Recent longitudinal data indicate that almost one-third of students in grades 9-11 initiated vaping over a one-year period.<sup>7</sup>

Vapes are rapidly evolving devices that deliver nicotine or other substances to the user without combustion.<sup>8</sup> Due to the appealing flavours of vapes, their lack of combustion, and their promotion as a less harmful alternative to smoking cigarettes, youth tend to believe that vapes are a harmless method of taking in nicotine.<sup>9</sup> However, nicotine has a negative impact on the developing adolescent brain<sup>10</sup> and given the addictive nature of nicotine, vapes may draw in a new generation of nicotine users. Evidence suggests that youth who vape are at higher risk of cigarette smoking and using other tobacco products,<sup>11</sup> increasing their risk of developing cancer in the future. As such, the rise in the popularity of vapes among youth in Canada could have profound public health implications.

The school environment is a unique setting of influence where youth from a variety of backgrounds and cultures spend a significant amount of time and where they can be influenced by programs, policies, and peers.<sup>12-14</sup> Recent evidence indicates that many students witness their peers vaping at school (peer influence), increasing their risk of experimenting with vapes.<sup>15,16</sup> Given that the school environment impacts the likelihood that a student will use a variety of tobacco products,<sup>17</sup> including vapes,<sup>18,19</sup> school-based prevention programs have an important role. Tobacco prevention programs motivate students to 'take action' to avoid harmful behaviours, and evidence indicates that these programs reduce the risk of smoking among students.<sup>20</sup> Due to the novelty of vapes, there are very few school-based prevention programs targeting vaping and fewer that have been rigorously evaluated to demonstrate their effectiveness at preventing vaping initiation.<sup>21,22</sup> To date, only 3/8 school-based vaping prevention programs have been evaluated,<sup>23-25</sup> and these evaluations demonstrate that students have increased knowledge of the risks of vaping after exposure to these programs.

Effective school-based substance use prevention programs should be based on theory, should be interactive and allow students to ask questions and practice refusal skills, and should incorporate social norms including correcting misperceptions about the prevalence of substance use among peers and normative expectations about substance use.<sup>21,26</sup> One program that incorporates these components is 'CATCH My Breath' (CMB), an evidence-based vaping prevention intervention for students in grades 5-12 in the US.<sup>27</sup> A pilot test evaluation of CMB among middle school students in the US identified a significant increase in knowledge and a significant 45% decrease in vaping initiation in intervention schools relative to control schools at 16-month follow-up.<sup>27</sup>

Given the demand from Canadian high schools for vaping prevention programming, there is a need to examine the feasibility and effectiveness of CMB in the Canadian context during a period when many initiate risk behaviours. According to implementation science, assessing implementation factors such as feasibility is necessary to support dissemination and scalability of the intervention.<sup>28,29</sup>

## 1.1 Objectives

The aim of this pilot project was to test the implementation of CMB in a sample of high schools in Ontario in order to support its adoption and scalability in high schools across Canada. Specifically, this project fulfilled the following objectives:

**Objective 1:** Identify youth and presenter perceptions about the appeal, appropriateness, and comprehensiveness of the curriculum

**Objective 2:** Assess short-term changes in (i) knowledge of the risks of vaping, and (ii) attitudes towards vaping

**Objective 3:** Examine the feasibility of implementing the full CMB curriculum in Ontario high schools

## 2. Methods

### 2.1 Design

This pilot study collected both quantitative and qualitative data to understand the context for implementing CMB in high schools in Ontario. The use of a multimethod design enabled the researchers to obtain a greater understanding of the program's efficacy by evaluating both the underlying processes and its impact.<sup>30</sup> Moreover, the study's design aligned with an effectiveness-implementation hybrid design,<sup>31</sup> which blends components of clinical effectiveness trials and implementation trials to inform the potential scalability of interventions.

Qualitative interviews with the curriculum presenters (teachers and Public Health Unit staff) and focus groups with students provided in-depth insight into the perceptions of the appeal, appropriateness, and comprehensiveness of the curriculum. Given the many competing demands of teachers and their limited time, it was easier to recruit them for individual interviews rather than focus groups. When conducted appropriately, youth focus groups generate rich data because the interaction amongst the participants yields information that might not be disclosed in individual interviews.<sup>32,33</sup> These qualitative data provided insight into the context for implementing the curriculum, which will positively impact scalability and intervention adoption in other Canadian schools.

Quantitative student-level data were collected using a one-group pretest-posttest design. Specifically, a survey was delivered prior to and after the delivery of the curriculum in order to identify changes in knowledge of the risks and attitudes towards vaping.

### 2.2 Materials

#### 2.2.1 'CATCH My Breath' intervention

CATCH My Breath (CMB) was developed to address the elevated rates of vaping among students in the US.<sup>25</sup> It was designed to be easily accessible for the presenters and to fit into existing class schedules as a stand-alone program or as a module inserted into a tobacco prevention program.<sup>27</sup> CMB is based on best practices from previous school tobacco prevention studies<sup>20,34-37</sup> and incorporates input from experienced curriculum writers and teachers.<sup>27</sup> The program incorporates Social Cognitive Theory<sup>38</sup> to foster social competence and social influence resistance skills, which are known to be important ingredients of successful smoking prevention programs.<sup>20,25</sup>

The CMB program was designed to be delivered through four 35- to 40-minute lessons by a trained presenter and through a range of formats, such as in-person, online synchronous, and asynchronous learning. The presenters were provided access to the necessary materials (e.g., detailed curriculum) and resources (e.g., full click-and-play versions of the lessons, classroom handouts) through the CATCH digital access portal (<https://letsgo.catch.org/>). The CMB lessons informed students of the components of vapes and the known and potential health consequences and addiction risk of vaping; discussed social norms and reasons for vaping; provided students with positive alternatives to vaping and strategies to resist peer influences; helped students to recognize advertising and messaging tactics by the vaping industry; and discussed school, provincial, and national policies for vaping.<sup>25,27</sup> As the original lessons were designed for a US-based audience, slight adaptations were made to the curriculum for the Canadian context prior to delivery (e.g., including Canadian prevalence data, Canadian vaping policies).

Prior to implementing the intervention, the presenters were provided with training through either a one-hour live webinar with a CMB Program Manager or pre-recorded videos and an associated quiz. Additional training videos and materials were also available on-demand to teachers after they completed the training. Previous pilot data indicate that webinar training was preferred by teachers.<sup>25</sup>

For this pilot project, CMB lessons were delivered in 28 classes between October 2022 and April 2023. The curriculum was delivered by teachers, with two exceptions. At two schools (a total of seven classes), the CMB lessons were delivered by the public health nurse, supported by a health promoter, delegated to the participating school. The mean time period between the first and last lesson was 5.17 school days ( $SD = 1.85$ ). The majority of CMB lessons were presented within Grade 9 Phys-Ed classes ( $n = 21$ ). On other occasions, the curriculum was delivered in either Grade 9 Science ( $n = 4$ ) or Grade 9 English classes ( $n = 3$ ). Finally, the CMB lessons were delivered most frequently over 2 days ( $n = 12$ ), followed by 4 days ( $n = 7$ ), 3 days ( $n = 4$ ), and 5 days ( $n = 1$ ; four classes were unknown).

### 2.2.2 Student Survey

To assess short-term changes in knowledge of the risks of vaping and attitudes towards vaping, an online survey was distributed to students who received parental permission and were exposed to the CMB curriculum. Hosted on LimeSurvey,<sup>39</sup> the student survey was provided before (baseline) and after (follow-up) exposure to the CMB curriculum, consisted of the same 38 questions, and was administered during class time (with the exception of one school) up to one week prior to the first lesson and four weeks after the final lesson. Similar to previous research,<sup>40</sup> the first five questions were used to develop a unique code for each respondent that allowed the research team to link baseline/follow-up student data. The remaining items consisted of demographic questions (grade, age, gender, race/ethnicity, amount of spending money), validated vaping measures (ever and current use),<sup>25,41,42</sup> knowledge questions relevant to the curriculum, questions assessing positive and negative attitudes towards vaping, social exposure to vaping (friends, family members), and questions about cigarette smoking and exposure. The survey was designed to be completed within 10-15 minutes to reduce participant burden (mean time to complete: 8.1 min for baseline, 7.6 min for follow-up). A copy of the survey can be found in Appendix A.

### 2.2.3 Interview & Focus Group Guides

The interview and focus group guides were informed by the Consolidated Framework for Implementation Research (CFIR)<sup>43</sup> and explored facilitators and barriers to implementing the CMB curriculum; perceptions of the appeal, appropriateness, and comprehensiveness of the curriculum; and recommendations for future curriculum development. The guides consisted of a series of



primary questions which covered the main content related to the discussed topic.<sup>44</sup> The interview and focus group guides can be found in Appendix B and Appendix C, respectively.

## 2.3 Participants

### 2.3.1 School boards and schools

After obtaining ethical approval from the Research Ethics Board (REB) at Ontario Tech University (#16837, approved April 27, 2022), nine research applications were submitted to Ontario-based school boards: five were approved, three were rejected, and one was still pending upon project completion. A total of 51 schools were contacted about participating in this pilot project. Consistent with the protocol of other large-scale multi-school studies (e.g., COMPASS),<sup>45</sup> schools were offered \$250 for participating in this pilot study. Of these schools, 33 of them were from an approved board and the remaining 18 schools were independent (i.e., private schools). Through these contacts, 15 schools were recruited into the pilot project and 10 participated, including two schools from Northern Ontario and an independent, all-girls school. The rationale provided by the five schools that dropped out included ‘not having enough time to implement the curriculum’, ‘comfortable with current curriculum’, and ‘vaping was addressed to the targeted cohort’. Interest in the project (and the CMB curriculum) grew as the study progressed. The mean estimated student population of the participating schools was 575.5 (SD = 307.4, 130-1020).<sup>1</sup> Table 1 outlines the general characteristics of the schools participating in the CMB pilot project.

**Table 1.** Characteristics of the schools participating the CMB pilot project, n=10

| Characteristic                             | % (n)    |
|--|----------|
| Location (in Ontario)                      |          |
| North                                      | 20.0 (2) |
| East                                       | 30.0 (3) |
| Central                                    | 50.0 (5) |
| Geographic Classification <sup>a</sup>     |          |
| Small                                      | 20.0 (2) |
| Medium                                     | 30.0 (3) |
| Large                                      | 50.0 (5) |
| School Type                                |          |
| Public                                     | 80.0 (8) |
| Catholic                                   | 10.0 (1) |
| Independent/Private                        | 10.0 (1) |
| Time of Project Participation <sup>b</sup> |          |
| Fall                                       | 45.5 (5) |
| Winter                                     | 54.5 (6) |

<sup>a</sup> Small population centres consist of a population between 1,000 and 29,999; medium population centres have a population between 30,000 and 99,999; large population centres consist of a population of 100,000 or more <sup>48</sup>.

<sup>b</sup> One school delivered the CMB lessons in both the Fall and Winter Semesters.

### 2.3.2 Students

In each participating school, students were recruited for two elements: baseline/follow-up surveys and focus groups. The students who were eligible to participate were those individuals completing Grade 9 classes in which the CMB lessons were delivered. While the sample was predominantly Grade 9 students, some older students were present in the classes. Initially, it was intended for the CMB lessons to be delivered in the recruited school’s Grade 9 Health and Physical Education class

<sup>1</sup> The data used were obtained from two publicly available datasets published by the Government of Ontario (2022, 2023)

because the content aligned with the corresponding Ontario curriculum and all students are required to take a physical education class at this grade level. However, during school recruitment some schools chose to deliver the lessons in other required classes for Grade 9 students.

For the baseline/follow-up surveys, either an active or passive consent procedure was implemented, depending on the requirements of the approving school board. During active consent procedures, a study invitation message was sent to the parents/guardians of each eligible student. This message was delivered via the school's blended learning platform (e.g., Google Classroom) and/or an email distributed by the school on the research team's behalf. The invitation contained a brief introduction to the study and a link to the consent form, which was hosted on LimeSurvey.<sup>39</sup> Parents/guardians were given two weeks to complete the consent form, and a reminder was sent to parents/guardians two days before the deadline. Following this two-week time period, a list of eligible students was compiled and provided to those individuals responsible for delivering the baseline survey.

During passive consent procedures, parents/guardians of eligible students were provided a study information letter two weeks prior to the baseline survey. Like the invitation distributed for the active consent procedure, this letter was delivered via the school's blended learning platform (e.g., Google Classroom) and/or an email distributed by the school on the research team's behalf. Furthermore, a paper copy of the document could have been distributed by the school at their own discretion. Within this information letter, each recipient was informed that they had two weeks to remove their student from the study by contacting the Project Manager. A reminder was sent to parents/guardians two days before the deadline. After the conclusion of the allocated time frame, those individuals responsible for delivering the baseline survey were provided a list of students who were not eligible to participate. Table 2 outlines the number of students with permission and the number of completed surveys according to consent procedure. It is evident from these data that passive consent procedures resulted in a higher number of students with permission and a higher number of completed surveys.

**Table 2.** Number of students with permission and number of completed surveys, according to consent procedure

|                                       | Active Consent | Passive Consent | Total            |
|---------------------------------------|----------------|-----------------|------------------|
| Number of schools                     | 8              | 2               | 10               |
| Estimated number of eligible students | 552            | 284             | 836              |
| Number of students with permission    | 215            | 279             | 494              |
| Number of baseline surveys            |                |                 |                  |
| Completed                             | 216            | 243             | 490 <sup>a</sup> |
| Removed                               | 31             | 115             | 177 <sup>a</sup> |
| Total for analysis                    | 185            | 128             | 313              |
| Number of follow-up surveys           |                |                 |                  |
| Completed                             | 136            | 124             | 266 <sup>b</sup> |
| Removed                               | 15             | 10              | 31 <sup>b</sup>  |
| Total for analysis                    | 121            | 114             | 235              |

<sup>a</sup> 31 participants did not indicate the school that they attended in the baseline survey; therefore type of consent could not be determined. These data were removed from the dataset due to a lack of responses.

<sup>b</sup> 6 students did not indicate the school that they attended in the follow-up survey; therefore type of consent could not be determined. These data were removed from the dataset due to a lack of responses.

Active consent procedures were used to recruit participants for the focus groups. A similar procedure to the baseline/follow-up surveys was used. However, unlike the surveys, the total number of students recruited for the focus group was limited to a maximum of 12 participants per session. This restriction in the size of individual focus groups was intended to strike a balance between being able

to obtain a diverse understanding on the investigated topic from the participants and managing the group effectively.<sup>49,50</sup>

A total of six focus groups were conducted at five schools with a total of 40 students. Each session was conducted during school hours. Five of the focus groups were conducted in-person and one focus group was conducted virtually using Google Meet. Prior to the start of the session, the participants were asked to complete an assent form and a short demographic survey. All of the focus groups were guided by an interview schedule (see Appendix C) and facilitated by a moderator team that consisted of a minimum of two members of the research team.<sup>50</sup> Five focus groups were digitally recorded; one focus group was not recorded because a student's parent/guardian did not provide permission during the consent process. During the latter instance, a member of the moderating team took notes about the discussion that occurred during the focus group. The mean length of the focus groups was 36.6 mins ( $SD = 10.6$  mins). Following completion of each session, the participants were provided with a \$10 gift certificate for a local restaurant in appreciation of their time.

### 2.3.3 Intervention Presenter

The individuals involved in the delivery of the CMB curriculum at each school were recruited to complete a one-on-one semi-structured virtual interview. Following the start of the CMB lessons, the intervention presenters were invited via email to participate in the interview. The invitation email contained a brief introduction to the study and a link to the consent form, which was hosted on LimeSurvey.<sup>39</sup> After completing the consent form, a virtual interview was scheduled at a time that was convenient to the interviewer and the interviewee. Two trained Research Assistants (RAs) conducted all interviews using a guide (see Appendix B). Of the 20 potential participants, 13 presenters provided consent and 12 presenters across nine schools completed an interview. One participant withdrew their consent due to time constraints. All interviews were conducted and recorded using Google Meet. The mean length of the interviews was 41.9 mins ( $SD = 19.3$  mins). After completing the interview, each participant was offered \$50 in appreciation of their time.

## 2.4 Data Analysis

### 2.4.1 Qualitative Data

A qualitative thematic analysis identified major themes related to the feasibility of implementing CMB and the appeal, appropriateness, and comprehensiveness of the curriculum from presenter interviews and focus groups with students.<sup>51</sup> For both datasets, the recordings were transcribed verbatim through the transcription option provided by either Google Meet or Microsoft Office 365. The outputs from these electronic transcription processes were then audited by a member of the research team. This step involved the reviewer reading and editing the transcript while carefully listening to the audio recordings. The general purpose of transcript auditing is to improve the accuracy of the data by improving the study's credibility and dependability, which in turn enhances its trustworthiness.<sup>52</sup> The completion of this transcript audit resulted in a total of 160 pages ( $M = 12.3$ ,  $SD = 2.8$ ) for the individual interviews and 94 pages ( $M = 15.7$ ,  $SD = 6.4$ ) for the focus groups.

Transcribed narratives from interviews were analyzed independently by two trained RAs, overseen by the Principal Investigator, using open coding techniques to reflect the core questions in the interview guide and the research objectives. The findings were reviewed repeatedly using the constant comparative method.<sup>53</sup> The Principal Investigator resolved any differences in coding. The qualitative data were managed and analyzed with Dedoose, which is a cloud-based software that allows for collaboration and comparison.<sup>54</sup>

The focus group transcripts were analyzed by the Project Manager. Similar to the individual interviews, open coding techniques were used to ensure that the codes reflected the core questions of the interview guide and the research objectives. Furthermore, a constant comparative method was implemented while reviewing the findings<sup>53</sup> and any variations in coding were resolved by the Principal Investigator. Finally, the data derived from the focus groups were managed and analysed with Dedoose.<sup>54</sup>

The next step for both data sets involved the collation and combination of the established codes into larger groups or themes.<sup>51</sup> During this phase of the analysis, members of the research team engaged in several discussions pertaining to the development of these themes for the topics covered in the interview guide. From this dialogue, the codes in each topic were collated into main themes, each of which were given a title and a short description. For each main theme, quotes were selected that offered the clearest illustration.

#### 2.4.2 Quantitative Data

Data from baseline/follow-up surveys were linked based on the unique codes created by participating students. Significant differences in the demographic characteristics of students who could and could not be linked across the baseline/follow-up surveys were examined using Chi-square tests (Appendix F). McNemar's Chi-square exact tests of paired proportions assessed significant differences in the proportion of students who correctly answered knowledge questions about vapes relevant to the curriculum and who agreed with statements about attitudes and perceptions about vaping before/after exposure to the curriculum. A sensitivity analysis repeated the analysis for significant differences in knowledge and attitudes to vaping in the full, unlinked sample of students using Chi-square tests (Appendix F).

### 3. Results & Findings

#### 3.1 Objective 1

Addressing the first objective of this pilot project (i.e., to identify youth and presenter perceptions about the appeal, appropriateness, and comprehensiveness of the curriculum) was accomplished through the completion of presenter interviews and student focus groups. The findings from these data collection processes are presented below.

##### 3.1.1 Findings from curriculum presenters

The demographic characteristics of curriculum presenters who completed a one-on-one interview are found in Table 3. The participants had been in their role for a mean of 14.8 years ( $SD = 9.2$ , 3.0-29.5) and at the school for an average of 12.1 years ( $SD = 10.0$ , 2.0-29.5).

**Table 3.** Demographic characteristics of the interview participants, n=12

| Characteristic                | % (n)    |
|-------------------------------|----------|
| Role of presenter             |          |
| Teacher                       | 75.0 (9) |
| Public Health Unit Staff      | 25.0 (3) |
| Location (in Ontario)         |          |
| North                         | 25.0 (3) |
| Central                       | 33.3 (4) |
| East                          | 41.7 (5) |
| School Type                   |          |
| Public                        | 75.0 (9) |
| Catholic                      | 16.7 (2) |
| Independent/Private           | 8.3 (1)  |
| Subject of Class <sup>a</sup> |          |
| Physical Education & Health   | 63.6 (7) |
| English                       | 18.2 (2) |
| Science                       | 18.2 (2) |

<sup>a</sup> One presenter delivered the CMB lessons in two classes of differing topics. Two presenters worked together to deliver the curriculum in the same classes.

During one-on-one interviews with the curriculum presenters, five main topics were covered: program delivery, program content, program effectiveness, training, and cost. From a thematic analysis of the collected data, several themes were established within each of these areas (summarized in Appendix D).

#### 3.1.1.1 Program delivery

Emerging from the discussion surrounding the delivery of the CMB curriculum were two main themes: facilitators and challenges.

##### 3.1.1.1.1 Facilitators

Presenters mentioned a number of factors that made delivery of the CMB curriculum easy. These key facilitators included the prepared slides and materials, editable slides, and the notes provided under the slides.

Presenters appreciated the **prepared slides and materials** which meant there was very little planning on their part, any teacher could “pick up and use those lessons” (Teacher, Eastern Ontario). As one presenter said, “I appreciated the fact that the lessons and the slides were all complete. [...] There was very little planning if anything for initial planning at least” (Teacher, Central Ontario). Another presenter jokingly stated that it’s “like a trained monkey could have delivered that program that had so nicely laid out.” (Teacher, Eastern Ontario).

Some presenters found the **editable slides** helpful because it allowed them to adjust the content to make it their own, making them more comfortable delivering it. For instance one presenter stated:

*It's kind of nice that [...] you could take and make it your own and just, you know, even change a wording or something. I definitely was cautious, not to change what the whole message of obviously a slide was, but it was nice that I could just add something in or change it or even add in like a transition or something like that to keep [the students] engaged. (Teacher, Northern Ontario)*

Moreover, the **notes in the slides** also helped a number of presenters. It allowed them to have more information about the topics being covered so that the presenters were more comfortable with the

delivery. For instance, one of the presenters indicated “the notes and the slides are really easy to follow and really easy to provide the presentation to the students” (Public Health Unit staff, Eastern Ontario). Another presenter commented that the instructor notes at the bottom of the slides provided helpful suggestions for how to present the material (Teacher, Northern Ontario).

The **background of presenters** also emerged as a theme that facilitated program delivery. Many of the curriculum presenters were Physical Health and Education teachers who already had background knowledge of vaping products and had “been teaching this stuff for a while” (Teacher, Central Ontario). As a result, they found the material quite simple and easy to follow.

#### 3.1.1.1.2 Challenges

Presenters also mentioned a couple of factors that made delivery of the CMB curriculum difficult. The **length of the lessons** was challenging for some presenters. The original program was designed for middle schools where class periods are shorter (35-40 minutes) than in high school (60-75 minutes). Many presenters combined the material from lessons together in order to fit the content into two class periods. However, some presenters mentioned that the amount of material was not always balanced between the four lessons. A Public Health Unit presenter (Eastern Ontario) mentioned that they kept lesson 1 and lesson 2 separate because these lessons were more content-heavy, but combined lessons 3 and 4 together. Other presenters mentioned that they were not able to complete some activities because of the amount of content that needed to be covered during the class periods. For one Public Health Unit presenter, it “felt like we didn’t have enough time to cover all of the content and do all of the activities that were included. So, we kind of felt like sometimes we were rushing through the information” (Public Health Unit staff, Eastern Ontario). In contrast, other presenters indicated that they took more time to deliver the lessons. For example, one presenter mentioned that students were engaged in the activities, and so they let students “discuss a little bit more and be more involved in the activities. So instead of the 35-40 minutes, I made sure every [lesson] was about an hour long” (Teacher, Northern Ontario).

Another challenge to delivery mentioned by some participants was the **requirement for a classroom setting**. Participants faced challenges because the curriculum was designed for a classroom setting that allowed the presenter to visually show slides and interact effectively with students. Curriculum presenters who mentioned this theme were often teachers who taught Physical Education and Health classes, which are not always delivered in a normal classroom setting. One presenter noted that “they don’t have their own specific class. Because they’re usually outside or in the gymnasium, they don’t actually have a classroom” (Public Health Unit staff, Eastern Ontario), and another presenter indicated that “we had to just deliver it wherever we were. So, if I was scheduled for the gym that day, we did it. If I was in the pool, we didn’t do it. [...] it’s less than ideal for the situations where some of us were teaching the lessons” (Teacher, Central Ontario).

A couple of presenters mentioned that delivering the CMB lessons required **more preparation than they expected**. In these cases, the presenters took time to review the material in advance so that they were knowledgeable about the content and prepared for the activities in the lessons. As one presenter stated: “I’m detail-oriented so I made sure I checked with every aspect of it before I went into each lesson” (Teacher, Central Ontario). Another presenter stated “I like to be prepared. No matter what I teach, I want to make sure that I’m going over it thoroughly and making sure that I understand everything” (Teacher, Northern Ontario).

### 3.1.1.2 Program content

Presenters provided feedback and comments about the content of CMB lessons. Key main themes were the appeal, appropriateness, and comprehensiveness of the content, as well as suggestions for changes.

#### 3.1.1.2.1 Appeal of the program

The content of the CMB program was **appealing** to the presenters. As one presenter said, “I think it’s a good program. I think it should be in the schools” (Teacher, Northern Ontario). During the interviews, presenters noted several specific features that were appealing to them and students. Firstly, presenters commented on the **engaging activities** that were included in the curriculum. One presenter explained how engaging activities are important for this age group because they are “smart and they understand the process of everything, so they want something a little bit more engaging and a little bit more hands on” (Teacher, Central Ontario). This same presenter also mentioned how the activities allowed students to “be creative and show who they are” (Teacher, Central Ontario). Presenters frequently mentioned two specific activities that were well-received by students: role-playing refusal skills and creating posters about the harms of vaping. As one presenter explained, role-playing refusal skills allowed students to move around and interact with each other: “they like the, the exit strategy activities, where they had to mix and mingle, they loved getting up and doing that” (Teacher, Central Ontario). Another Public Health Unit presenter was surprised by the level of engagement of the students in the activities:

*They really got into the activity where they got to do the warning label [...] sometimes Grade 9, you know, they’re just, they aren’t as motivated sometimes. But they really got into it and they really enjoyed it. So I was pleasantly surprised how much they actually participated in the activities. (Public Health Unit staff, Eastern Ontario)*

These interactive and hands-on activities helped the students stay engaged and actively participate in the learning process. Participants also appreciated the **videos** noting that they effectively built upon the content while capturing students’ attention. As one presenter explained about the pre-recorded videos:

*I thought they were pretty effective, you know, they were, they were, I like the fact that they were quite short as I find with student engagement nowadays or student attention span. Anything, you know, that’s a class in our case, a class is an hour and 15 minutes. So, these videos were about, you know, 10 minutes or so, 12 minutes. This way it builds upon the language to talk about and enhance the program. So, I thought it was well done, those, those videos. (Teacher, Central Ontario)*

Presenters frequently mentioned that students enjoyed the video with ice cream cones that illustrated the appealing flavours of vapes. One presenter explained how this video captured the attention of students and led to discussion:

*The one I remember is with the ice cream cones and the different flavours. The kids were like ‘What?’, you know. So, it got their attention right away and it got them discussing, right? (Teacher, Northern Ontario)*

These aspects of the curriculum **promoted discussion** which encouraged student engagement with the material and deeper learning. One presenter explained how the activities are how “you hook kids. That’s where you have the conversations. That’s where conversation or topics come up” (Teacher, Eastern Ontario). A Public Health Unit presenter explained how students “lit up” when discussing the flavours of vapes, which allowed them to make a more clear connection to industry tactics:

*The flavours is a huge, huge thing, like, they couldn't stop talking about mango ice for whatever reason. All of them in this program just kept saying, 'Oh, mango ice. This is the new go-to flavor'. So, and it was funny when they brought that up, because like, so they were talking to all these flavours. And when they started talking about them, they just lit up and they were like, you could just tell how much they were getting into it and I said, 'Do you guys see, like, how excited you just got when you talked about those flavours'. I said 'That is exactly what the tobacco industry wants. Like, they want you to hype it up, they want you to talk about it because that's what creates, you know, the curiosity and the excitement to want to pull you into it'. (Public Health Unit staff, Eastern Ontario)*

Another presenter described how students were shocked to learn about gastrointestinal irritation that can occur from vaping. This acute effect prompted investigation and discussion in their class:

*There's a funny comment I'll share with you is around, I want to say, acute effects of trying vaping. Of, you know, allergic reaction potentially, there can be some gastrointestinal stuff that can happen. So, anyways, one of the kids looked it up, and I guess it is, is an allergic reaction you can have where your gastrointestinal tract gets irritated and you can actually have diarrhea. [...] So one of the kids looked up and they basically said, 'You know, if you poop your pants after vaping, that's quite embarrassing. So, why the heck would I try vaping?' And I went, 'Hey, if that's what it takes, the fear of you pooping your pants on a social setting, don't vape'. And the kids were like, 'I'm not gonna vape. I don't want to poop my pants'. So it's like, hey, like, if that's what it takes [...] Nobody wants diarrhea, so I mean, that was pretty funny. It was a good, it honestly, it really hooked the kids, like that was, like everybody laughed. I was like 'Hey, you're allowed to laugh.' We laughed. We talked it out. And I said does everyone understand like how that can, is a health effect and they're like, 'Yeah we do' so it was good. (Teacher, Eastern Ontario)*

One presenter explained how they extended the length of the lessons because the class was having great discussion and they “didn’t want to cut it off or stop the conversations or the interactions if the students were working together on something” (Teacher, Central Ontario).

However, a few presenters also expressed concerns about the amount of content in the lessons, especially with how the original CMB lessons were combined for high school students. They noted that the abundance of slides made it challenging to maintain student engagement, particularly during the first lesson which included a lot of content. One Public Health Unit presenter suggested that “if there were less slides and content, then there would be more time for the activities” (Public Health Unit staff, Eastern Ontario), which would make the program more appealing for both students and schools.

#### 3.1.1.2.2 Appropriateness of the content

Presenters were asked whether the CMB curriculum targeted the appropriate audience. Three sub-themes were identified relating to the appropriateness of the content for high school students, the appropriateness of the content for all learners, and the alignment of the content to the Ontario curriculum.

The general agreement among presenters was that the CMB program was **suitable for Grade 9 students**. As one presenter stated: “I think for Grade 9 it was right on target” (Teacher, Northern Ontario). Another presenter commented on the program’s ability to address concerns, pressures, and decision-making challenges that adolescents may experience in high school: “I think, you know, like there was an understanding of who teenagers are, the pressures that teenagers face” (Teacher, Eastern Ontario).



The presenters provided valuable insights into the program's appropriateness for various types of learners. Most presenters felt that the content was understandable and **appropriate for all learners**, including those with diverse learning needs and those who were multilingual learners. Images and classroom discussions were highlighted as effective tools for engaging all learners. As one presenter explained:

*I think there's enough images. I think there was enough classroom discussion about the, the pictures and the images. And there was enough of a discussion that they were fine with, with what was going on. (Teacher, Central Ontario)*

Despite the general positive responses, a few concerns were raised that the content may not be appropriate for students with diverse learning needs, suggesting that some students may need accommodations and modifications in order to participate in class discussions.

Participants expressed that the CMB program was **compatible with the current Ontario Health and Physical Education curriculum**. While the Ontario curriculum does not exclusively focus on vaping, participants could see the value of including this topic given its relevance to students. Notably, presenters emphasized the program's ability to effectively engage students in critical discussions about vaping, health, and decision-making that are important curriculum expectations. For example:

*I found the 'CATCH My Breath' resources to be awesome and actually on par completely with, with the 'Healthy Active Living' curriculum. So, what I really liked about it was it tied in decision-making skills which is something that teenagers need a lot of help with, you know, that reasoning part of like, you know, cause-effect. So I really liked that, and I also really liked how the 'CATCH My Breath' program tied in the advertisement and media awareness because often you know, kids don't, are not able again to see that they are the target of advertising. So I really, really liked how, how 'CATCH My Breath' added those two things. (Teacher, Eastern Ontario)*

#### 3.1.1.2.3 Comprehensiveness of the program

Presenters commented on whether the curriculum was complete and covered all of the necessary information. In these discussions, presenters mentioned specific aspects of the curriculum that were important and novel to students, including the fact that vapes produce an aerosol, the risk of addiction, developing media literacy, developing refusal skills, and family participation. Presenters generally thought the curriculum was comprehensive.

A few presenters brought to light an important realization among students: **vapes produce an aerosol**, not a harmless water vapour. The realisation that vaping emits harmful metals and cancer-causing compounds had an impact on students, prompting many to reconsider their attitudes towards vaping. As one presenter said:

*I think the students are surprised to learn that the vape cloud isn't water vapour. I think that's a key point for them to learn. And the fact that there's metals being released, I think that was new information for them. You could genuinely see them going 'oh' and then when they actually saw the chemicals like formaldehyde and things like that that are cancer, are known cancer causing chemicals, I think they start to see it in a different way. (Teacher, Central Ontario)*

Another presenter made a connection between the content from the CMB lessons and what is taught in other science courses:

*Every single student has to take Grade 9 Science, mandatory. Number one thing to be able to do a lab and a Grade 9 science class is to learn your, you know, your chemicals and your safe handling course in regards those chemicals. So let's say a chemical like formaldehyde, all those students associate that with dissection. So, to have that associated with dissection really hit home with them because they couldn't, you know, they couldn't get over that component would be in e-juice. (Teacher, Eastern Ontario)*

Presenters also appreciated the focus on the **risk of addiction** with vaping and its impact on the developing adolescent brain. Presenters commented that students were “really shocked to know how [many] milligrams of nicotine is in one vape and how quickly you can get addicted” (Public Health Unit staff, Eastern Ontario). One Public Health Unit presenter explained that many students are not aware of how much nicotine is in vapes:

*The addiction piece I think is probably one of the most important pieces, you know, really talking about how addiction and nicotine can really, you know, mess with your brain. And I think a lot of students are not aware of that. I don't think they're aware of just how much nicotine is in vaping products. (Public Health Unit staff, Eastern Ontario)*

Presenters applauded the program's integration of **media literacy** and the emphasis on the influence of advertising. These were seen as important features that connected with Ontario's Health and Physical Education curriculum expectations. The difference between direct and indirect marketing was identified as new information for students. Presenters also noted that students were “shocked” and “blown away” by the amount of money that vaping companies spend on advertising. Presenters mentioned that the program explained how students are targeted by advertisements. One presenter explained how the material about advertising helped open up the conversation to advertising more broadly. By making a connection between vaping advertisements and other advertisements students might see, the presenter noticed more engagement and felt like students were able to understand the material better.

*Instead of me focusing it on just vaping, I was able to open up the lesson in terms of just general advertising. [...] The example that I gave was what's a male product? A design for males, that nails down, like sound, music, like show, like the being a celebrity and things like that. And kids immediately got it and they said 'Old Spice'. And everyone knows, everyone knows the 'Old Spice' commercials, that advertisement and I said, 'Perfect. If you know the jingle, or if you know what I'm talking about, that's how they get you.' [...] Opening a generalizing to all advertisements. Then if I nail it down to vaping in the [slide show], the examples of vaping advertisements and why they do the same thing. [...] They're like, 'Oh I get it now. I understand what they're trying to do'. (Teacher, Central Ontario)*

Presenters also noted the importance of developing **refusal skills** through the lessons. This was also seen as an important feature that connected with Ontario's Health and Physical Education curriculum expectations. One presenter felt that before the lessons, students didn't really have a plan in mind about how they could refuse an offer to vape (Teacher, Northern Ontario), so the CMB curriculum provided students with an opportunity to prepare and practice their exit strategies. Another presenter noted that this was a more tangible activity for students to engage in (Teacher, Central Ontario). A Public Health Unit presenter noted that role-playing refusal skills was a unique part of the CMB curriculum:

*I really did like, as I said earlier, the activity around making an excuse or you know, developing those refusal skills [...] And I think there's other programs out there that are missing that piece and so I really like that piece of the program. (Public Health Unit staff, Eastern Ontario)*

Finally, a few presenters commented on the value of **family participation** in the curriculum. One presenter said:

*I did like that there were the opportunities, like, they could go home and interview their parents. So, connecting the, the content and having a discussion at home with their family, I like that. (Teacher, Eastern Ontario)*

Another presenter noted that while they understood the intention of including the adult interview in the curriculum, a lot of students didn't do it, citing that there can be a disconnect between home and school and students forget to do it (Teacher, Central Ontario).

#### 3.1.1.2.4 Suggestions for change

Some presenters provided suggestions about how the CMB curriculum could be modified and improved for future students and presenters. These suggestions could be grouped into four sub-themes: reorganizing content, additional activities, updates to content, and added content.

Some presenters commented on the redundancy and difficulty of combining multiple lessons together in one class period. One presenter noted that the content was repetitive, possibly leading to disengagement among students. As a result, some Public Health Unit presenters suggested **reorganizing the content** by moving some of the information from the first lesson into the second lesson and designing the lessons so that they were a little bit shorter so that they could more easily be delivered in a single class period. Given that the original CMB lessons were originally designed for middle schools, which have shorter class periods, reorganizing the lessons to fit within longer class periods in high schools is warranted.

Other presenters offered suggestions about **additional activities** that could be included to improve student engagement. One presenter suggested including a digital game and online resources in the curriculum, especially since all Ontario high school students have access to a digital device in school:

*Even like a quick Kahoot design or Blooklet design for [lesson four] would be great. Like instead of having students summarize it on a piece of paper [...] I think something digital would be great, like a game to play, for example. [...] So, maybe in the instructions for sharing, instead of using Post-it notes and cue cards, for classrooms that are able to use technology, maybe suggest some online resources where they can do that instead. (Teacher, Central Ontario)*

Other presenters commented that the lessons included statistics and examples that were not Canadian and this **content should be updated**. Many presenters mentioned that students questioned the statistics about the percentage of Canadian adolescents that vaped, noting that they were "older stats" (Teacher, Northern Ontario). Students believed a higher percentage of their peers vaped. As one presenter said: "they didn't believe the percentage of kids. They thought it would be way higher. Maybe it's the area we live in, but they just thought that the stats were like a little bit low" (Teacher, Northern Ontario).

Presenters also pointed out that the statistics about the amount of money that vaping companies spend on advertising was based on data from the US and not Canada. One presenter noted that "it would be nice to know if there's any, any Canadian data on the amount of money that's spent on advertising in Canada, just to make it more relevant again to Canadian students" (Public Health Unit staff, Eastern Ontario). Additionally, the same Public Health Unit presenter noted that the brand Juul is more popular in the US than in Canada, and the inclusion of examples of other brands could be more appropriate:

*The first lesson talks about Juul because that's a very popular vaping brand in the US. But I think if we wanted to make it more Canadian, that would probably perhaps have a slide about STLTH because I think that's the most popular vaping device in Canada, just to make it more relevant for students. (Public Health Unit staff, Eastern Ontario)*

Finally, Public Health Unit presenters noted that the advertisements shown in the lessons tended to be ones that are more visible in the US compared to Canada. There are important differences in regulations between Canada and the US, such that billboard and magazine ads are not seen in Canada. However, these presenters noted that students likely see advertisements and posts by social media influencers, including on YouTube and TikTok. The curriculum could include a greater discussion of the types of advertisements students might see on social media.

Some presenters provided suggestions for **content that could be added** to the curriculum. These were often more unique suggestions, being provided by a single presenter. One suggestion was to add personal testimonials about the consequences of vaping. One presenter thought that this would be a better approach for reaching students rather than having teachers tell them the information.

Other presenters suggested adding information about the long-term health risks of vaping, particularly as our knowledge of health effects has grown. While a Public Health Unit presenter acknowledged that we're not aware of all of the long-term consequences yet, they thought there "are some long-term consequences that I think we are aware of that aren't addressed in this particular program" (Public Health Unit staff, Eastern Ontario).

In addition, a Public Health Unit presenter suggested adding information about how to support those who already vape. This presenter realized that some students in the class may already vape and could benefit from information that supports their efforts to quit or reduce vaping:

*I know that there is a handful of [students who] are vaping already, so maybe just adding in like more of a harm reduction lens to it. Like, you know, if you are vaping like here is the supports you can go to or, you know, if you are vaping a 40 milligram pod, like, try to start decreasing down to like a 20 or 10 kind of thing because I felt, I did see some kids [...] I didn't want them to feel like they were being pointed out or anything because they had already started vaping. (Public Health Unit staff, Eastern Ontario)*

Another Public Health Unit presenter suggested adding information about the parts of vapes (such as the mouthpiece, battery, how it works) and examples of different types of vapes. This presenter made a connection to the training they received, which included an activity where participants had to select the images of objects they thought were vapes. This presenter thought this type of activity would illustrate that some vapes are made to look like regular objects, which would be surprising for some students.

Finally, a presenter suggested including references with the curriculum resources. While this presenter thought that most students will just believe and trust the information that is given, "there may be a couple students that may be curious as to where these numbers come from. I think it will be always nice for the, the teacher to have links to those studies or, or papers, academic papers" (Teacher, Central Ontario).

### *3.1.1.3 Facilitator Training*

Presenters commented on whether the training they received to deliver the curriculum was adequate or inadequate. While presenters thought that the curriculum materials (e.g., lesson plans, slides)

were helpful, many explained that they wanted more training about how to deliver and teach the lessons.

A few presenters, particularly Public Health Unit presenters, thought that the training was **adequate** because they had prior knowledge about the topic. As one Public Health Unit presenter stated: “I’d say the training was minimal, which is fine for a Public Health individual who, I’ve done numerous vaping presentations in the past. So, I feel like I probably already had that background information” (Public Health Unit staff, Eastern Ontario). Another presenter also mentioned that they were knowledgeable about the topic before the training presentation, so they “found it easy to follow” (Teacher, Eastern Ontario). However, these presenters also noted that other individuals without the background content knowledge may have more difficulty following the training presentation and be less prepared to deliver the curriculum. As one Public Health Unit presenter explained:

*I felt comfortable with the content, but for someone like a teacher or, you know, like let’s say like an English teacher that has never done, you know, any like vaping background or anything like that, it might be a little bit more like, a little bit more challenging.* (Public Health Unit staff, Eastern Ontario)

One important reason for perceptions about **inadequate** training was that presenters thought the training was introductory and did not explain the lessons or activities. As one presenter said, the training was “an introduction to what vapes were and the program itself. It was not a training session on how to teach the lesson” (Teacher, Central Ontario). Many presenters expected the training to cover key components of the curriculum and explain some of the activities. As one Public Health Unit presenter suggested: “having the training go through some of the presentation and key components and helping to give them tips for delivering the information would have been helpful” (Public Health Unit staff, Eastern Ontario). Another presenter suggested providing time during the training session for participants to review the website materials and come back with any questions. This participant noted that teachers are busy throughout the day, so they don’t have time to review the materials. Providing 10-15 minutes during the training meeting to make sure they can “pull all the things up, make sure you got whatever you can access, all the work and everything” (Teacher, Northern Ontario) would have been helpful.

#### 3.1.1.4 Cost

Presenters were asked how they felt about the \$300 USD cost of the CMB curriculum. Main themes identified included too costly, worth the cost, and who should pay for the curriculum. Most presenters thought that the curriculum was **too costly**. For example, one presenter noted that the price was excessive and unreasonable: “Okay, I think that’s a bit too much” (Teacher, Central Ontario). The same presenter also suggested that maybe a lower price of \$100 is more appropriate for the curriculum.

Furthermore, other presenters highlighted that they were already teaching some of the content in their classes, making its high cost unjustifiable. As an illustration, one presenter said that “I’d have to talk to my administration about that because we wouldn’t pay it ourselves obviously, but to me it seems a bit much. It’s a good resource, but I had taught some on this topic” (Teacher, Northern Ontario). Moreover, other presenters conveyed their objection to pay for the curriculum, stating that developing lessons falls within the purview of their professional responsibilities. As one presenter said:

*So why would they pay an extra \$300 [...] when I can design my own? You know what I’m saying so I can, I can see our board not doing it again, just because like it’s our job to be able to prepare lessons like this.* (Teacher, Northern Ontario)

In other words, some participants believed that the price of the material was not justified. They felt that certain aspects of the curriculum were already being taught separately, and the bundled curriculum did not warrant the cost of \$300. Re-evaluating the price of the program could make it more attractive to potential users and could contribute to the sustainability of the curriculum in the future.

However, it should be noted that not every presenter felt this way; a few presenters did find the information novel, valuable, and **worth the cost**. For instance, one presenter indicated that “I think it's reasonable to have that” (Teacher, Eastern Ontario), while another presenter explained how purchasing the curriculum would save them a lot of time and effort:

*Like for me to go out and find all this stuff, prepare all the slideshows, to do the videos, to find relevant curriculum, that's so much. That's like my whole summer, right? I mean, that's, I can't do this on a weekend. I can't get the amount of information that has been put together in this short amount of time. Like, if I had to just, all of a sudden I knew I was gonna be teaching grade 9, to be like, 'Oh my gosh. Now, I have to create all this from scratch.' You can't do that. So, \$300 would be worth it. (Teacher, Central Ontario)*

Another common theme that was identified was **who should pay** for the curriculum. Presenters admitted that public schools have limited funding for this type of resource. As a result, presenters thought that the “information should be provided on a bigger scope, a bigger level” (Teacher, Eastern Ontario), often suggesting that the curriculum should be purchased through the school board or the Public Health Unit. Therefore, while some schools may decide to purchase the curriculum, it may be more reasonable to approach school boards and Public Health Units with this resource as they have more funds available to purchase it.

#### 3.1.1.5 Perceived Effectiveness

Presenters were asked whether they thought the curriculum was effective at preventing students from vaping. Key main themes included that the lessons increased student knowledge, the lessons were less effective for students who already vaped, and the content should be provided in earlier grades.

As suggested previously (under the theme of 3.1.1.2.3 Comprehensiveness of the program), many presenters thought that the content in the lessons **increased student knowledge** about the harms of vaping. In particular, it was noted that students were surprised to learn about the chemicals that are present in vapes and the amount of nicotine present in vapes. As a result of this new information about the harms of vaping, presenters thought that the lessons “made students have a second thought about [vaping] and I think that's the goal of it, which was to have students think about it twice before actually doing it” (Teacher, Central Ontario). Another presenter noted that the content helped students think about how vaping affects other dimensions of their life, and not only their health:

*They weren't aware of the cost. They weren't aware of how it affects your life in other ways other than your health. So, I think that was really important, and in their completion of the final day when they had to do that little contract about, you know, I choose not to vape. This is why a lot of them are just saying, like, 'I have goals to achieve', and 'My health', you know, and 'Family to be around'. (Teacher, Central Ontario)*

Some presenters discussed different types of students when thinking about whether or not the program would be effective. For those who did not vape, presenters thought that the program confirmed their reasons for not vaping. For those students who had not made a firm commitment not

to vape, some presenters thought these students would be less likely to try vaping after learning the information in the program:

*There is a handful of students in those classes that have kind of been on the sense of like, you know, 'Maybe I will start vaping, maybe I won't'. And I think that this program would be enough to tip them over to the 'maybe I won't try' [side]. (Public Health Unit staff, Eastern Ontario)*

A few presenters thought that the program was **less effective for students who already vaped**, because “they’re going to do what they want to do”, although “sometimes you have to plant the seed and give it time to let it grow” (Teacher, Central Ontario). Often it takes repetition of the same message before students hear and accept the information. Ultimately, one presenter noted that “even if it hit one kid and they really said, ‘You know what? This is not something for me and I didn’t realize the negative effects of it’. I think that’s beneficial” (Teacher, Northern Ontario).

Public Health Unit presenters commented on the need to **provide this information in earlier grades**. They felt that “by grade 9, most students have probably already made a decision” (Public Health Unit staff, Eastern Ontario). One presenter noted that some high schools in their area include students in grades 7 and 8, so those students have already been exposed to older students that vape by the time they enter grade 9. As a result, these presenters felt that the program needed to be provided before students enter high school in order to be more effective.

### 3.1.2 Findings from students

Table 4 outlines the demographic characteristics and vaping status of students who participated in the focus groups. During these sessions, several topics were discussed that were related to the CMB curriculum, such as what stood out to them, what was appealing and unappealing, the appropriateness of the lessons, who was the target of the program, the credibility of the information, the comprehensiveness of the program, the program’s effectiveness, and suggestions for changing the lessons. Following a similar format as the previous section, the themes established through the analysis of the collected data are divided according to these areas of discussion (summarized in Appendix E).

**Table 4.** Demographics characteristics and vaping status of focus group participants, n=39 a

| Characteristic                                | % (n)      |
|---|------------|
| Grade   |            |
| 9   | 97.4 (38)  |
| 10  | 2.6 (1)    |
| Age, mean (stdev)                             | 14.2 (0.5) |
| Gender  |            |
| Girl  | 53.9 (21)  |
| Boy   | 38.5 (15)  |
| Other   | 7.7 (3)    |
| Ethnicity                                     |            |
| White   | 63.6 (28)  |
| Other/Mixed                                   | 36.4 (16)  |
| Vaping status <sup>b</sup>                    |            |
| Never vaped, not susceptible to future vaping | 28.2 (11)  |
| Never vaped, susceptible to future vaping     | 48.7 (19)  |
| Tried vaping (used at least once)             | 23.1 (9)   |
| School location (in Ontario)                  |            |
| North   | 9.8 (4)    |
| Central                                       | 41.5 (17)  |
| East  | 48.8 (20)  |

<sup>a</sup> 2 students did not provide demographic information about themselves

<sup>b</sup> Students classified as “not susceptible to future vaping” responded “Definitely not” to survey questions about being curious about vaping, vaping if their best friend offered them a vape, and vaping during the next year. Students classified as “susceptible to future vaping” responded “Probably not”, “Probably yes”, or “Definitely yes” to these questions.

### 3.1.2.1 What stood out?

From the discussion of what stood out from the lessons or what grabbed their attention, the participants’ responses can be divided into five main themes. One theme that emerged was the **ingredients found within vapes**, which was elucidated through such comments like “the thing that stood out to me is the fact that the same thing that is used in vapes like the aerosol is also used in air refreshener” (Student, Central Ontario) and “the chemicals inside of it, of course. Especially when I learned that there was cleaning products inside of it. Like that, that part I, I was flabbergasted” (Student, Central Ontario). Another student offered a similar response that highlights this theme.

*Different like chemicals and stuff that are also included in like pods and cartridges, that sort of thing. Like, it's not just like the flavour and the nicotine, like, there's a ton of other chemicals in there that are potentially harmful.* (Student, Eastern Ontario)

A second main theme that arose during the discussions around what stood out was **the health effects of vaping**. Some students highlighted the impact of vaping in general terms, such as “there's like a whole bunch of health effects that go with it” (Student, Central Ontario). However, there were other students who noted more specific health effects, like “one thing that stood out to me was how it can affect like if a woman is pregnant and she uses a vape and can have effect on the fetus” (Student, Northern Ontario).

**Vaping industry tactics** is a third theme that emerged from the data. Under this theme, the students emphasized the marketing and advertising strategies used by vaping companies, the financial investment in vape promotion, and the range of available flavours. One student noted the marketing and advertising strategies by stating “how subtle the advertisement for vaping can be. Like we were shown different advertisements and some of them didn't even look like vape ads. This made it seem



like it was such a cool thing to do” (Student, Central Ontario). Another student noted that the methods used to advertise vapes make it seem that they are a healthier alternative to cigarettes. Several students noted the large quantities of money that are invested in the promotion of vapes. The participants not only mentioned that value, “\$1 billion”, but also the rate of spending, “\$100/hour”. Students also noted the range of available flavours, saying that “there’s like, I don’t know what the slideshow said, it was like over 8,000” (Student, Northern Ontario) flavours on the market.

A fourth theme related to the topic of ‘what stood out’ was **nothing**. For some students, the CMB curriculum rehashed what they were taught previously, and these students did not learn any new information from the lessons. This idea was presented clearly by one student, who made the following statement:

*We've already learned a bunch about that in my, like in my other health classes that I've already had. So, a lot of the information was already pretty known to me, like I didn't experience anything that was unfamiliar to me.* (Student, Eastern Ontario)

### 3.1.2.2 Appealing

Another topic covered during the student focus groups revolved around what the participants liked about the lessons. Four main themes emerged that illustrated those aspects of the CMB curriculum that the students found appealing. These themes are: interactivity, reflection, informative, and structure.

For the **interactivity** theme, the students noted their enjoyment with being able to engage with their peers while completing the various activities in the CMB curriculum. This notion was stated succinctly by two students when they stated “I really enjoyed how it was interactive, there are little activities that we got to do throughout” (Student, Northern Ontario) and “I like all the group work” (Student, Eastern Ontario). An underlying rationale for enjoying the interactivity of the CMB lessons was that it offered the students a chance to collaborate with others, which could enhance both the learning process and student engagement. This idea was discussed by two students on separate occasions during the same focus group session. During the first instances, a student commented that “The collaboration kept people from tuning it out. Like you always knew you gotta listen so you can do the activities after” (Student, Eastern Ontario). For the second instance, another student indicated that:

*Well, to talk to your, your friends and other people so that you can kind of share what you think and what they thought. Maybe there's something that you learned that you wouldn't have thought of if you worked by yourself.* (Student, Eastern Ontario)

A second theme related to the appeal of the CMB curriculum is the notion of **reflection**. Specifically, the activities enabled the students to think about and reflect on the presented information. While discussing a particular activity, a student noted this idea when they stated that “[the poster] got you thinking about everything that you've learned and then condensing it into one place” (Student, Eastern Ontario).

With the third theme, **informative**, several members of the focus groups commented on how specific topics covered in the CMB lessons (e.g., refusal skills, marketing strategies) expanded their understanding of the issues as it relates to vaping. Moreover, one student commented on the practical nature of the information in their personal vaping prevention efforts by stating that “I enjoyed learning about vaping and mostly the negative effects because I can use those to stop people in the future from vaping” (Student, Northern Ontario).

In terms of **structure**, some of the students felt that the content within the CMB curriculum was organized in a logical manner. This notion was best summarized by one participant who stated that “I think that it was a really good program and the way it was organized made a lot of sense” (Student, Northern Ontario).

### 3.1.2.3 Unappealing

While addressing the aspects that the students disliked about the CMB lessons, students discussed elements of the curriculum that were inaccurate, unrealistic, and uninteresting. First, some students thought that the youth vaping prevalence statistics presented in the lessons were **inaccurate** because they “weren’t up-to-date, they’re from a few years ago” (Student, Northern Ontario). Other students thought that some of the examples of refusal skills were **unrealistic**, as demonstrated through the following conversation:

*Student 1: ... However, some of [the refusal skills] I felt would not work like ever. And they're just like I don't know, just not unrealistic kind of.*

*Student 2: Yeah, like [Student 1] said, like someone is really going to care if you're saying 'oh no my uncle is picking me up' or like 'I have to go to the bathroom'. I feel like you could just say 'no'. I don't think you have to make up these crazy excuses. Oh, and adding humour to it and I feel like yeah some of the ways it was weird you could just say 'no' to it.*

*Student 3: Yeah, I agree because I feel like it's even better to just say 'no' or say something like 'no I respect your decision if you want to vape, but I am not going to do it thanks'. Because they know that it is not a joke and they know that 'no' is 'no'. They know for sure, whereas if you say a joke or something that could be perceived like 'Oh I can ask them later', is not as direct. (Students, Central Ontario)*

As for the **uninteresting** theme, some students highlighted a level of boredom and demotivation while completing the CMB curriculum. For some students, these feelings were partly because the lessons were delivered in place of their regular gym classes, which they enjoy. As one student noted,

*I was not as motivated as I was because I have gym first period, so I was obviously not, I know it was effective and it got all points across and you know I was tuning into all the activities and stuff and it was not that I didn't have any fun or anything. It's just I feel like I would have been more motivated to do it if I had math or something first period that I could have done instead of math. (Student Eastern Ontario)*

Other students indicated that their disinterest in the lessons stemmed from the use of a slideshow format to present the content.

*I feel when people see a slide show they kind of just think more and the lesson that might make some things not pay as much attention because it might feel they're kind of being forced to listen to just a boring lesson. (Student, Central Ontario)*

Other students felt that their disinterest in the program related to how the curriculum was delivered and the types of activities used. As indicated by a student, “we didn't really get to do anything. We just wrote things down on the sheet of paper. And looked at the Smart Board and that was it” (Student Eastern Ontario).

### 3.1.2.4 Lesson Appropriateness

The two main themes of appropriate and inappropriate arose from the discussions about the appropriateness of the CMB lessons to their age group. Several students indicated that the program

was **appropriate** and suitable for their age group with straightforward affirmative responses, such as “Yeah, yeah. I think it was” (Student, Eastern Ontario) and “Everything was appropriate, yeah, and necessary” (Student Eastern Ontario). One student commented on the suitability and relevance of the provided curriculum:

*I feel if you feel you are, you know, mature enough to vape that you should be mature enough to know the risks and consequences of it, so yeah, I think that was necessary for us to know.* (Student, Eastern Ontario)

In contrast, other students felt that the CMB curriculum was **inappropriate**, unsuitable, and irrelevant to their age group because its delivery within grade 9 was deemed too late by some students. This idea was exemplified through the following exchange among the participants:

*Student 1: I was thinking, it could also be used for younger age groups, that are like one to experiment and stuff.*

*Interviewer: Okay, what specific age group do you think?*

*Student 1: Probably like Grade 7 and 8, even 6.*

*Interviewer: Okay. So starting early.*

*Student 2: ... I agree with [Student 1]. I think it would be appropriate for middle school groups, this program before, you teach it to them before they might start experimenting, before they're in high school.* (Students, Northern Ontario)

### 3.1.2.5 Who was targeted?

Students thought that the curriculum was targeted to students in general, students thinking of trying vaping, and adults. The participants in the focus groups generally thought that the curriculum was aimed towards **students** as a way to prevent them from starting to vape:

*I think it's targeted towards the students because I think the adults kind of want to get them out of that habit of vaping and harming their bodies. So they want, they want to make them more aware of the consequences and the chemicals they're putting into their lungs and their systems.* (Student, Northern Ontario)

Other students suggested that the target of the curriculum was specifically those who were **thinking about trying vaping**. As one student noted, “I think that it's more targeted to students that are thinking about starting vaping and that they're trying to catch them before they do start and get addicted” (Student, Eastern Ontario). This theme was further supported by the succinct remark of another student:

*Probably to the people that have used a vape or are like, were considering doing it, just so they know the risks. And at that point, it's up to them if they still want to do it or not because they know the risks and they know the harm it can cause.* (Student, Eastern Ontario)

For the final theme, **adults**, some students thought that the CMB curriculum was directed to an older population. The offered rationale for the remarks within this theme revolve around either the content or how it was presented. This idea was exemplified through the following exchange between the interviewer and some of the focus group participants:

*Student 1: Okay, well I feel like they made it for, trying to make it for us, but it sounds more for adults.*

*Student 2: They're using these words and everything.*

*Interviewer: Ohh, so complicated words or words that are like not everyone would understand, [Student 2]?*

[students nodding]

*Interviewer: [Student 3], you agree?*

*Student 3: It's like a little more formal. (Students, Central Ontario)*

### 3.1.2.6 Credibility of the Information

The main themes that emerged from the discussion pertaining to the credibility of the content in the CMB curriculum were believable and unconvincing. For the theme of **believable**, some students noted the legitimacy of the information in a straightforward manner with such statements like “Yeah, it seemed really, it all seemed believable” (Student, Eastern Ontario) and “Looking pretty good. Yeah, it all seemed pretty good. I can't, I can't think of anything else that didn't seem believable” (Student, Northern Ontario). Other students highlighted the believability of the CMB program while focusing on specific aspects of the content. This notion may be observed in the following comment regarding the effects of vapes.

*I believe that there are a lot of different side effects to it because of everything I've learned from different sources, not just this program. Because I've heard it different places, it makes more sense in my mind what the program was telling me. (Student, Central Ontario)*

Another student indicated the believability of the content as it related to the marketing of vapes.

*Probably like the marketing techniques because I feel that it's easy to believe because it would make sense if they would want to market it to a younger audience, if that's the people that use it the most. (Student, Central Ontario)*

Another theme that arose from the discussion of the credibility of the information presented in the curriculum was **unconvincing**. Notably, some students expressed their skepticism towards the prevalence statistics presented in the lessons. Since the data were not up-to-date, students thought that it did not reflect how many students actually vape.

*And another thing is like the statistics because you could like, some of them, since they weren't up-to-date compared to now, I couldn't 100% believe it because there's a lot more people that vape in our school. (Student, Northern Ontario)*

Another source of the students' doubt was that some of the information may be exaggerated, such as the amount of nicotine in a vape being equivalent to the amount of nicotine in a pack of cigarettes (Student, Central Ontario).

### 3.1.2.7 Comprehensiveness

In discussing the comprehensiveness of the CMB program, students were asked what they thought was missing from the curriculum lessons. Students generally agreed that the lessons were **complete**, indicating that the curriculum was “pretty comprehensive” (Student Eastern Ontario) and that “everything was covered” (Student, Central Ontario). One student noted the comprehensiveness of the program by stating that “Yeah, I don't really think there was much. I feel like if there was anymore that it would just kind of be like a not totally necessary information. It would be more like an information dump” (Student, Eastern Ontario).

### 3.1.2.8 Perceived Effectiveness

Two main themes emerged from the students' responses while discussing the perceived effectiveness of the CMB program. For the first theme, **preventive**, several students suggested that the lessons are effective, especially at deterring individuals from starting to vape. The following comments are indicative of this perspective: "I do feel like it'll be. I think it's pretty effective at preventing it" (Student, Eastern Ontario), "I do think this will help prevent because I certainly do not want to vape after reading this presentation" (Student, Northern Ontario), and "I feel like it'll help prevent people vaping" (Student, Eastern Ontario).

Students also discussed how the curriculum would have a **limited effect** among those who already vape. Students across the various focus groups commented on how the lessons may not result in vaping cessation: "And honestly, probably won't stop anything. If a kid wants to vape, they will. They want to do it, they will" (Student, Eastern Ontario), "I don't know how effective it will be at getting people to quit if they've already started just because of the addiction of it" (Student, Eastern Ontario).

Some of the students reasoned that the limited effect of the CMB program for students who vape may be because these students skip class and are not present to hear about the health risks. Other students thought that students who vape need to personally experience a negative health consequence (e.g., cancer) in order to stop vaping:

*Student: Maybe it gives you a little bit information, but I don't think there's much that can actually stop someone that like from vaping.*

*Interviewer: So why do you think like that?*

*Student: Well, it's just I know some people who vape and just like the personality and stuff like I feel like any lesson wouldn't stop them from vaping unless it was like them getting sick or someone they know that's really sick. (Student, Central Ontario)*

### 3.1.2.9 Suggestions for Change

Over the course of the focus groups, the students offered suggestions regarding how the CMB program may be altered. One recommendation that emerged through the discussion involved **tailoring the presentation** to the audience. Under this theme, the adjustment in the language used, the incorporation of celebrities, and making it more enjoyable were some ways that the lessons could be amended. The first change was highlighted by one student in the following excerpt.

*I think that they could have like changed how they were outputting the information to like get at, at-risk kids more engaged and like have them like actually taking the information so that they can understand it better rather than just having them write things down on the sheet of paper that they might not like fully take in all the information. (Student, Eastern Ontario)*

Another student noted the celebrity suggestion when they indicated that:

*It would basically use the reverse. Instead of celebrities promoting vaping, I would be like, more people who are like people, kids our age who idolize these people, who don't vape, who tell them they've been not good for you, it's not something you do. That's what I did for my preventive poster. I did 'Taylor Swift doesn't vape, you shouldn't too'. (Student, Central Ontario)*

Students also suggested making the program “less written I guess and less staring at the board and watching 30 second videos on the board” (Student, Central Ontario) and “make it all fun, entertaining, that kind of thing” (Student, Central Ontario) in order to make it more enjoyable.

Focusing on the **negative health effects** of vaping is the second recommendation for changing the CMB program. Specifically, the focus group participants noted that scare tactics, real life stories, and discussions surrounding the long-term effects of vaping should be included into the lessons. In terms of the scare tactics, students indicated that “I would design it to scare people out of doing it” (Student, Eastern Ontario) and “I personally would really focus on the negatives and maybe show a model of the lungs or something that's affected by vaping” (Student, Northern Ontario). As for real life stories, one student remarked that they were interested in hearing stories about how vaping negatively affected someone close to their age range. Regarding discussions pertaining to the long-term effects of vaping, a student commented that “I feel like maybe more like long-term effects cause [...] like it's more severe, like once you've been doing it for a long time” (Student, Northern Ontario).

The third recommendation offered by the focus group pertained to the **homework assignments**. In particular, some students felt that the out of class activities were irrelevant or unnecessary. For instance, one student stated that:

*I feel like there shouldn't have to be homework that you do outside of class because the thing is, it's not like this lesson, it's not like it contributes to your, like your grade point average, it's not like it's going to boost up your report card. So I feel like there doesn't need to be any homework. (Student, Central Ontario)*

The lessons and assignments may need to be better connected to the Ontario curriculum so that the assignments are relevant and necessary to students. For the final recommendation, the students suggested some **changes to the presentation of the content** in the CMB curriculum. One of these adjustments suggested by a student involved emphasizing the key points in the slides. Other suggested modifications include shortening the program's length, exploring why teenagers vape, and more discussion regarding the marketing of vapes towards adolescents.

### **3.2 Objective 2**

To assess the short-term changes in knowledge of the risks of vaping and attitudes towards vaping, students completed a brief survey up to one week before and approximately four weeks after exposure to CMB. The data presented in the following section is based on  $n = 116$  students whose baseline/follow-up data could be linked (23.5% of those with consent, 37.1% of students who completed the baseline survey). Demographic characteristics of the linked sample are presented in Table 5. The majority of students were in grade 9, identified as girls, and identified as White ethnicity. At baseline, 19.1% of these students reported lifetime vaping, and among this group, 59.1% reported vaping in the last month. Of those who never vaped, 51.6% were susceptible to (or at risk of) future vaping. Appendix F compares the demographic characteristics of the sample of students who could be linked at baseline and follow-up, with those who could not be linked. Students who could be linked at baseline and follow-up tended to be girls and non-susceptible to future vaping; there were no other significant differences in demographic characteristics.

**Table 5. Demographic and behavioural characteristics of the linked sample of students, n=116**

| Characteristic                                | % (n)      |
|---|------------|
| Grade   |            |
| 9   | 94.8 (110) |
| 10  | 5.2 (6)    |
| Age, mean (stdev)                             | 14.1 (0.5) |
| Gender  |            |
| Boy   | 32.8 (38)  |
| Girl  | 60.3 (70)  |
| Other   | 6.9 (8)    |
| Ethnicity                                     |            |
| White   | 66.1 (76)  |
| Other/Mixed                                   | 33.9 (39)  |
| Parents, step-parents, or guardians that vape |            |
| Yes   | 13.0 (15)  |
| No / I don't know                             | 87.0 (100) |
| Brothers or sisters that vape                 |            |
| Yes   | 14.8 (17)  |
| No / I don't know                             | 73.9 (85)  |
| No brothers or sisters                        | 11.3 (13)  |
| Close friends that vape                       |            |
| None of them                                  | 46.1 (53)  |
| Some of them                                  | 41.7 (48)  |
| Most / All of them                            | 12.2 (14)  |
| Vaping status <sup>a</sup>                    |            |
| Never vaped, not susceptible to future vaping | 39.1 (45)  |
| Never vaped, susceptible to future vaping     | 41.7 (48)  |
| Tried vaping, but does not currently vape     | 7.8 (9)    |
| Currently vapes                               | 11.3 (13)  |
| School location (in Ontario)                  |            |
| North   | 28.4 (33)  |
| Central                                       | 36.2 (42)  |
| East  | 35.3 (41)  |

<sup>a</sup> Students classified as “not susceptible to future vaping” responded “Definitely not” to survey questions about being curious about vaping, vaping if their best friend offered them a vape, and vaping during the next year. Students classified as “susceptible to future vaping” responded “Probably not”, “Probably yes”, or “Definitely yes” to these questions. Those who “currently vape” reported any vaping within the last 30 days.

### 3.2.1 Short-term changes in knowledge of the risks of vaping

As shown in Table 6, after being exposed to the CMB curriculum, students showed positive changes in knowledge about the risks associated with vaping. Across the nine statements, students exhibited a two-point improvement in their knowledge levels after exposure to CMB, with baseline scores averaging 5.5 and follow-up scores reaching 7.5. The mean difference in scores was significantly larger than zero ( $p < 0.001$ ), meaning there was a significant increase in knowledge scores after being exposed to the program.

**Table 6.** Percentage of students responding correctly to statements about vaping at baseline and follow-up, n=109 <sup>a</sup>

| Vaping statement  | % responding correctly at baseline (n) | % responding correctly at follow-up (n) | % change | p-value          |
|---|--|---|----------|------------------|
| Nicotine is addictive   | 95.4 (104)                             | 98.2 (107)                              | +2.8     | 0.375            |
| When you are addicted to something you lose control   | 78.0 (85)                              | 89.9 (99)                               | +11.9    | <b>0.004</b>     |
| E-cigarette vapour contains mostly water  | 38.5 (42)                              | 82.6 (90)                               | +44.1    | <b>&lt;0.001</b> |
| Most vapes, including JUUL, contain nicotine  | 78.9 (86)                              | 97.3 (106)                              | +18.4    | <b>&lt;0.001</b> |
| Most sweet flavoured vapes contain nicotine   | 78.0 (85)                              | 96.3 (105)                              | +18.3    | <b>&lt;0.001</b> |
| It is illegal for teens under the age of 19 to buy vapes  | 73.4 (80)                              | 89.9 (98)                               | +16.5    | <b>&lt;0.001</b> |
| Direct pressure is advertising that everyone knows is paid for by the tobacco or e-cigarette industry on billboards, magazines, television, and on the internet | 32.1 (35)                              | 66.1 (72)                               | +34.0    | <b>&lt;0.001</b> |
| Indirect pressure is advertising that hides who paid for the advertising and often doesn't even look like advertising   | 34.9 (38)                              | 65.1 (71)                               | +30.2    | <b>&lt;0.001</b> |
| Putting someone down for vaping is not a smart refusal strategy   | 45.0 (49)                              | 62.4 (68)                               | +17.4    | <b>0.003</b>     |

<sup>a</sup> Students with complete data

### 3.2.2 Short-term changes in attitudes towards vaping

Survey results also indicate some positive changes in attitudes and perceptions of social norms regarding vaping (Table 7). Significantly fewer students thought that they would “feel less stressed” if they vaped at follow-up. Furthermore, significantly fewer students agreed with the statement “Most people in high school vape”. While fewer students also agreed with the statement “Most people my age vape” at follow-up, it was not significantly different.



**Table 7.** Percentage of students agreeing with statements about vaping at baseline and follow-up, n=105 <sup>a</sup>

| Vaping statement: If I were to use an e-cigarette or vaping device... | % agree at baseline (n) | % agree at follow-up (n) | % change | p-value      |
|---|-------------------------|--------------------------|----------|--------------|
| I would like it   | 21.9 (23)               | 21.9 (23)                | 0.0      | 1.000        |
| I would enjoy the taste   | 35.2 (37)               | 40.0 (42)                | +4.8     | 0.359        |
| I would feel less stressed  | 34.3 (36)               | 24.8 (26)                | -9.5     | <b>0.031</b> |
| I would have fun using it   | 31.4 (33)               | 25.7 (27)                | -5.7     | 0.263        |
| I would be more popular   | 8.6 (9)                 | 14.3 (15)                | +5.7     | 0.146        |
| I would worry about my health   | 86.7 (91)               | 90.5 (95)                | +3.8     | 0.455        |
| I would get addicted  | 74.3 (78)               | 79.1 (83)                | +4.8     | 0.332        |
| I would get in trouble with my teachers                               | 75.2 (79)               | 82.9 (87)                | +7.7     | 0.169        |
| I would let my parents down   | 89.5 (94)               | 90.5 (95)                | +1.0     | 1.000        |
| My friends would avoid me   | 41.0 (43)               | 42.9 (45)                | +1.9     | 0.832        |
| I would be a bad role model   | 86.7 (91)               | 88.6 (93)                | +1.9     | 0.791        |
| Most people my age vape.  | 75.2 (79)               | 66.7 (70)                | -8.5     | 0.064        |
| Most people in high school vape.                                      | 83.8 (88)               | 75.2 (79)                | -8.6     | <b>0.049</b> |

<sup>a</sup> Students with complete data

### 3.3 Objective 3

The final objective of this pilot study was to examine the feasibility of implementing the full CMB curriculum in Ontario high schools. The sections that follow will comment on the feasibility of delivering the CMB curriculum and conducting school-based research, which is necessary for evaluating the impact of the curriculum.

#### 3.3.1 Feasibility of the CMB curriculum

Over the course of this pilot project, it has been established that it is feasible to implement the entire CMB curriculum within an Ontario high school context. This notion was highlighted by the growing interest in the project and the curriculum as the study progressed. In fact, more schools were recruited into the project than originally anticipated. Furthermore, there were mentions by school administrators, Public Health Unit staff, and teachers that this type of programming is both needed and desired in schools.

As illustrated in the results from presenters and students (3.1.1 Findings from curriculum presenters, 3.1.2 Findings from students), the CMB lessons were deemed acceptable. Most presenters completed the lessons within two class periods, and many felt that this was an appropriate amount of time to spend discussing vaping. However, the CMB curriculum was originally designed for elementary schools, where the class periods are shorter (30-40 minutes). In many Ontario high schools, classes are 60-75 minutes long. Lessons specifically designed for high school class periods should be created so that presenters do not need to adapt the lessons to their context.

Even though the program was successfully implemented by many classroom presenters, it became apparent that one factor that influenced the project's success was the presenter's engagement. Presenters who are passionate about the topic and comfortable with the content will provide a more dynamic learning experience for students. To ensure maximal impact of the program, it may be necessary to collaborate with other stakeholders who have a vested interest in the program's success (e.g., Public Health Unit staff) and who could deliver the lessons in schools.

Website analytics for the CATCH digital access portal indicate that it was feasible for presenters to access program documents online. Not surprising, the most accessed resources were the Quick

Start Guide, followed by curriculum materials (e.g., slides, educator guides, lesson plans for specific lessons). Some presenters also accessed the Click and Play video lessons and optional student quizzes. One challenge was getting presenters signed up to access the CATCH digital access portal in a timely manner. Delays in accessing the digital access portal resulted in frustrations for some presenters since they wanted to review the materials to make sure they were prepared for delivering the content in their classes.

While there were many aspects of the program that were feasible to implement, one challenge that emerged through the project was arranging presenter training. It quickly became apparent that it was difficult to schedule a time for the presenters to complete a virtual synchronous training session together due to competing time demands (e.g., extracurricular activities) and schedules across schools. In response, an asynchronous video-based training session was offered as a training alternative, which involved presenters watching pre-recorded videos and completing a quiz that tested the individual's knowledge of the presented information. Successful completion of the quiz (e.g., 80% result) would result in the user receiving a certificate of completion. However, there were additional challenges with this type of training because there was no way to monitor the presenter's quiz completion beyond the individual providing a copy of their certificate. It may be necessary to investigate alternative training formats to ensure the success of the program.

### 3.3.2 Feasibility of school-based research

Although the CMB curriculum was generally feasible to implement and well-received by schools, there were challenges completing the research aspects of the study. One challenge was recruiting school boards into the study. As indicated previously, research applications were submitted to nine Ontario-based school boards. While approximately half of the applications were approved, we did not receive a response from one school board about the status of our application by the end of the study and the review of another application was delayed significantly (and was rejected). While some school boards meet regularly (monthly, bi-monthly) to review applications to conduct research in their schools, others did not indicate when or how frequently they meet. Delays in the review of our research application by school boards resulted in delays in recruiting schools into the study, which delayed student recruitment, data collection, and delivering the curriculum.

Another major challenge was obtaining parental consent for student participants. Many of the included school boards required the use of active parental consent procedures, which required parents to review and sign a consent form permitting their students to complete the survey or participate in a focus group. This procedure had to be adopted because the targeted students were under 18 years of age. Compared with passive consent procedures, which involves parents reviewing an information letter about the study and notifying the researchers if they do not want their students to complete the survey or participate in a focus group, active parental consent procedures resulted in lower student participation rates. There is also evidence that the use of active parental consent procedures may result in some selection bias for who participates in the study.<sup>55</sup> In this pilot study, only 38.9% of students obtained consent to complete the surveys in schools requiring active parental consent procedures, compared with 98.2% of students in schools allowing passive consent procedures (see Table 2). Moreover, some presenters commented during their interviews on the challenge of getting parents to sign consent forms so that students could complete the surveys. The requirement for active parental consent procedures made it difficult to meet original targets of student recruitment.

Lower student participation rates among those with permission was an additional challenge encountered during this pilot project. After removing duplicate surveys and surveys with insufficient information (e.g., no linkage data, not demographic data), 63.4% of students with permission completed the baseline survey and 47.4% of students completed the follow-up survey (see Table 2).

Delays in school board application approval and school recruitment during the fall term resulted in the follow-up surveys at some schools being conducted close to the winter break. This reduced student participation rates as some students were absent from school, which impacted our ability to link student data from baseline to follow-up. We learned that the fall term is compressed because some school boards do not allow data collections to occur in September/October. This results in less time to send out consent forms, complete baseline surveys, implement the CMB lessons, and complete follow-up surveys.

A final challenge was recruiting students for focus groups. In addition to the requirement for active parental consent procedures, some students with consent decided not to participate in the focus group because it was scheduled during their lunch break. For these students, the incentive of a \$10 gift card was not sufficient to miss their lunch break. After receiving this feedback, we worked with the remaining schools to schedule the focus groups during a class period. The additional incentive of missing class helped to increase the number of students who obtained permission to participate in the focus groups.

## **4. Conclusions & Recommendations**

The 'CATCH My Breath' vaping prevention curriculum was successfully delivered in 28 grade 9 classes in 10 high schools in Ontario. Curriculum presenters and students highlighted key aspects of the curriculum including the negative health risks of vaping, vaping industry tactics, the development of refusal skills, and engaging activities to keep student interest. While curriculum presenters and students generally thought that the curriculum was appealing, appropriate, and comprehensive, they offered some suggestions for improvement, including revising and adding content, and modifying activities. After exposure to CMB, students displayed greater knowledge of the potential risks of vaping and some modest changes in perceptions of social norms. Future studies should evaluate the short- and long-term impacts of exposure to the curriculum on student vaping behaviours.

Recommendations for revising the content of CMB include:

- Reorganize and remove duplication across content so that it can be delivered in two 60-75 minute classes
- Update prevalence of vaping statistics, ensuring data are Canadian and reflect their age group
- Update evidence of health risks of vaping
- Add personal testimonies and examples about the consequences of vaping
- Add more relevant examples of vaping advertising in Canada
- Add information and resources about how to support those who want to reduce or stop vaping
- Add digital games and instructions for online activities that could be used in place of pencil-and-paper activities
- Update Canadian vaping policies
- Add references to presentation slides and relevant research articles to curriculum resources

Recommendations for revising the delivery and training of presenters include:

- Identify other stakeholders, such as local Public Health Unit staff, who could deliver the CMB curriculum to students
- Revise the training program so that it reviews program content and activities
- Explore alternative methods for training curriculum presenters
- Review the cost structure of the curriculum

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## Appendix A

### 'CATCH My Breath' Survey

Students across Ontario, just like you, have been asked to take part in this survey. This important survey will help researchers at Ontario Tech University understand youth vaping. Your answers will be used for programs for young people like yourself.

- **This is NOT a test.** All of your answers will be kept **confidential**. No one, not even your parents or teachers, will ever know what you answered. So, please be honest when you answer the questions.
- Mark only **ONE option per question** unless the instructions tell you to do something else.
- If you do not understand a question, or do not want to answer a question, leave it blank and continue to the next question.
- Choose the option that is the **closest** to what you think/feel is true for you.

**Thank you for your help today!**

Please read each sentence below carefully and select the correct letter, number, or word.

Note: These five questions are only used to link data from one time to the next. They cannot be used to identify participants. Only Ontario Tech University researchers have access to the responses, and they never have access to student names or other information. All responses are strictly confidential.

Information collected during this survey is stored on a secure server at Ontario Tech University. Please note that when information is transmitted over the internet there remains a possibility of a third party gaining access to that information. That said, because the survey does not ask for any identifying information (like your name), any information you provide will be anonymous.

1. What is the first letter of your **middle** name? (if you have more than one middle name use your first middle name; if you don't have a middle name use "Z") \_\_\_\_\_

- |                         |                         |                         |                         |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <input type="radio"/> A | <input type="radio"/> E | <input type="radio"/> I | <input type="radio"/> M | <input type="radio"/> Q | <input type="radio"/> U | <input type="radio"/> Y |
| <input type="radio"/> B | <input type="radio"/> F | <input type="radio"/> J | <input type="radio"/> N | <input type="radio"/> R | <input type="radio"/> V | <input type="radio"/> Z |
| <input type="radio"/> C | <input type="radio"/> G | <input type="radio"/> K | <input type="radio"/> O | <input type="radio"/> S | <input type="radio"/> W |                         |
| <input type="radio"/> D | <input type="radio"/> H | <input type="radio"/> L | <input type="radio"/> P | <input type="radio"/> T | <input type="radio"/> X |                         |

2. What is the name of the month in which you were born? \_\_\_\_\_

- |                                |                             |                                 |                                |
|--------------------------------|-----------------------------|---------------------------------|--------------------------------|
| <input type="radio"/> January  | <input type="radio"/> April | <input type="radio"/> July      | <input type="radio"/> October  |
| <input type="radio"/> February | <input type="radio"/> May   | <input type="radio"/> August    | <input type="radio"/> November |
| <input type="radio"/> March    | <input type="radio"/> June  | <input type="radio"/> September | <input type="radio"/> December |

3. What is the **last** letter of your full **last** name? \_\_\_\_\_

- |                         |                         |                         |                         |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <input type="radio"/> A | <input type="radio"/> E | <input type="radio"/> I | <input type="radio"/> M | <input type="radio"/> Q | <input type="radio"/> U | <input type="radio"/> Y |
| <input type="radio"/> B | <input type="radio"/> F | <input type="radio"/> J | <input type="radio"/> N | <input type="radio"/> R | <input type="radio"/> V | <input type="radio"/> Z |
| <input type="radio"/> C | <input type="radio"/> G | <input type="radio"/> K | <input type="radio"/> O | <input type="radio"/> S | <input type="radio"/> W |                         |
| <input type="radio"/> D | <input type="radio"/> H | <input type="radio"/> L | <input type="radio"/> P | <input type="radio"/> T | <input type="radio"/> X |                         |

4. What is the **second** letter of your full **first** name? \_\_\_\_\_

- |                         |                         |                         |                         |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <input type="radio"/> A | <input type="radio"/> E | <input type="radio"/> I | <input type="radio"/> M | <input type="radio"/> Q | <input type="radio"/> U | <input type="radio"/> Y |
| <input type="radio"/> B | <input type="radio"/> F | <input type="radio"/> J | <input type="radio"/> N | <input type="radio"/> R | <input type="radio"/> V | <input type="radio"/> Z |
| <input type="radio"/> C | <input type="radio"/> G | <input type="radio"/> K | <input type="radio"/> O | <input type="radio"/> S | <input type="radio"/> W |                         |
| <input type="radio"/> D | <input type="radio"/> H | <input type="radio"/> L | <input type="radio"/> P | <input type="radio"/> T | <input type="radio"/> X |                         |



5. What is the **first** initial of your **mother's** first name? (think about the mother figure you see the most) \_\_\_\_\_

- |                         |                         |                         |                         |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <input type="radio"/> A | <input type="radio"/> E | <input type="radio"/> I | <input type="radio"/> M | <input type="radio"/> Q | <input type="radio"/> U | <input type="radio"/> Y |
| <input type="radio"/> B | <input type="radio"/> F | <input type="radio"/> J | <input type="radio"/> N | <input type="radio"/> R | <input type="radio"/> V | <input type="radio"/> Z |
| <input type="radio"/> C | <input type="radio"/> G | <input type="radio"/> K | <input type="radio"/> O | <input type="radio"/> S | <input type="radio"/> W |                         |
| <input type="radio"/> D | <input type="radio"/> H | <input type="radio"/> L | <input type="radio"/> P | <input type="radio"/> T | <input type="radio"/> X |                         |

## About You

The following questions will be used to understand who is completing the survey to see whether all groups are represented. Only Ontario Tech University researchers will have access to the responses, and your responses will not be shared with anyone.

1. **What grade are you in?**

- Grade 9
- Grade 10
- Grade 11
- Grade 12

2. **How old are you today?**

- 13 years or younger
- 14 years
- 15 years
- 16 years
- 17 years
- 18 years
- 19 years or older

3. **Which of the following terms best describe your current gender identity?** *(Please mark all that apply)*

- Boy
- Girl
- Non-Binary (e.g., Genderfluid, Genderqueer)
- Questioning or not sure of my gender identity
- Transgender or Trans
- Two-Spirit
- I describe my gender in a different way
- I prefer not to say

4. **Which race category best describes you?** *(Please mark all that apply)*

- Black
- East Asian
- First Nations, Métis, and/or Inuit
- Latin American

- Middle Eastern
- South Asian
- Southeast Asian
- White
- Other: \_\_\_\_\_

5. **About how much money do you usually get each week to spend on yourself or to save?**  
*(Remember to include all money from allowances and jobs like baby-sitting, delivering papers, etc.)*

- Zero
- \$1 to \$5
- \$6 to \$10
- \$11 to \$20
- \$21 to \$40
- \$41 to \$100
- More than \$100
- I do not know how much money I get each week

## Your Experience with Vaping



**Vapes** (or vaporizers) are devices that produce vapour instead of smoke. They are sometimes called “**e-cigarettes**”, “e-cigs”, or “vape pens”. Vapes can have pods or tanks and can look like USB drives or pens. *Some examples of vapes are JUUL, Vype, Suorin, and Smok.*

6. **Have you ever tried a vape, also known as an e-cigarette?** (e.g., JUUL, Vype, Suorin, Smok)

- Yes
- No

[if Yes: then skip to Q10]

[if No: then Q7]

7. **Have you ever been curious about using a vape?**

[ask if Q6=No]

- Definitely yes
- Probably yes
- Probably not

- Definitely not

**8. If one of your best friends were to offer you a vape, would you use it?**

[ask if Q6=No]

- Definitely yes
- Probably yes
- Probably not
- Definitely not

**9. At any time during the next year do you think you will use a vape?**

[ask if Q6=No]

- Definitely yes
- Probably yes
- Probably not
- Definitely not

**10. How often do you currently use a vape?**

[ask if Q6=Yes]

- I do not currently use a vape
- Once in a while
- Less than weekly but at least once a month
- Less than daily but at least weekly
- Daily or almost daily

**11. On how many of the last 30 days did you use a vape?**

[ask if Q6=Yes]

- [open text number] days

**12. Have you ever tried to quit vaping?**

[ask if Q6=Yes]

- I have never vaped
- I have only vaped a few times
- I have never tried to quit
- I have tried to quit once
- I have tried to quit 2 or 3 times
- I have tried to quit 4 or more times

**13. Have you ever vaped marijuana or cannabis (including concentrates, waxes, or oils)?**

- Yes
- No

[if Yes: then Q14]

[if No: then skip to Q15]

**14. On how many of the last 30 days did you vape marijuana or cannabis (including concentrates, waxes, or oils)?**

[ask if Q14=Yes]

- [open text number] days

**15. In the last 30 days, has anyone offered you a vape?**

[ask if Q14=No]

- Yes
- No

16. Do any of your parents, step-parents, or guardians vape?

- Yes
- No
- I don't know

17. Do any of your brothers or sisters vape?

- Yes
- No
- I don't know
- I don't have any brothers or sisters

18. How many of your close friends vape?

- None of them
- Some of them
- Most of them
- All of them

## Your Opinions About Vaping

19. How many high school students do you think have vaped in the past 30 days?

- 0-20%
- 21-40%
- 41-60%
- 61-80%
- 81-100%
- I don't know

20. Do you think the following statements are true or false?

|  | True                  | False                 | I don't know          |
|--|-----------------------|-----------------------|-----------------------|
| a. Nicotine is addictive.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. When you are addicted to something, you lose control.                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. E-cigarette vapour contains mostly water.                                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Most vapes, including JUUL, contain nicotine.                                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Most sweet flavoured vapes (for example, candy/fruit flavour) contain nicotine. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. It is illegal for teens under the age of 19 to buy vapes.                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|
| g. Direct pressure is advertising that everyone knows is paid for by the tobacco or e-cigarette industry on bill boards, magazines, television, and on the internet. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Indirect pressure is advertising that hides who paid for the advertising and often doesn't even look like advertising.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

21. Which of the following is NOT a smart refusal strategy?

- Just say no
- Stand tall with friends that do not vape
- Put someone down for vaping
- Add some humour
- I don't know

22. How much do you agree or disagree with the following statements?

If I were to use an e-cigarette or vaping device...

|   | Strongly agree        | Agree                 | Disagree              | Strongly disagree     |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| a. I would like it.                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. I would enjoy the taste.                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. I would feel less stressed.                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. I would have fun using it with my friends.       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. I would be more popular.                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. I would worry about my health.                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. I would get addicted.                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. I would get in trouble with <u>my teachers</u> . | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. I would let <u>my parents</u> down.              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| j. My <u>friends</u> would avoid me.                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| k. I would be a bad role model.                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

23. How much do you agree or disagree with the following statements?

|                             | Strongly agree        | Agree                 | Disagree              | Strongly disagree     |
|-----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Most people my age vape. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|                                     |   |   |   |   |
|-------------------------------------|---|---|---|---|
| b. Most people in high school vape. | ○ | ○ | ○ | ○ |
|-------------------------------------|---|---|---|---|

## Your Experience with Smoking

24. Have you ever tried cigarette smoking, even just a few puffs?

- Yes
- No

[if Yes: skip to Q28]

[if No: then Q25]

25. Have you ever been curious about smoking cigarettes?

[ask if Q24=No]

- Definitely yes
- Probably yes
- Probably not
- Definitely not

26. If one of your best friends were to offer you a cigarette, would you smoke it?

[ask if Q24=No]

- Definitely yes
- Probably yes
- Probably not
- Definitely not

27. At any time during the next year do you think you will smoke a cigarette?

[ask if Q24=No]

- Definitely yes
- Probably yes
- Probably not
- Definitely not

28. On how many of the last 30 days did you smoke one or more cigarettes?

[ask if Q24=Yes]

- [open text number] days

29. Have you ever tried to quit smoking cigarettes?

[ask if Q24=Yes]

- I have never smoked
- I have only smoked a few times
- I have never tried to quit
- I have tried to quit once
- I have tried to quit 2 or 3 times
- I have tried to quit 4 or more times

30. Do any of your parents, step-parents, or guardians smoke cigarettes?

- Yes
- No
- I don't know

31. Do any of your brothers or sisters smoke cigarettes?

- Yes
- No
- I don't know
- I don't have any brothers or sisters

**32. How many of your close friends smoke cigarettes?**

- None of them
- Some of them
- Most of them
- All of them

**Want to stop vaping?** Quash is a free mobile app designed to help youth quit vaping. The app allows you to design your own customized quit plan based on your goals, personality, values, and interests. You can also track your cravings and earn badges when goals are reached.

The logo for the Quash app, featuring the word "Quash." in a bold, dark blue font. The letter "Q" is significantly larger and has a light blue outline. A light blue horizontal line underlines the text.

Powered by

**LUNG HEALTH FOUNDATION**

The Stop Vaping Challenge app is a fun, social way that encourages quitting with friends. A timer tracks how long you have stopped vaping. The app also lets you track your mood and cravings, record photo and video memories, and find other resources to help you stop vaping.



## Appendix B

### Semi-structured interview guide - Teachers

|                    |                   |
|--------------------|-------------------|
| School name:       |                   |
| Date of interview: | Interviewer name: |
| Interviewee name:  | Start time:       |
| Interviewee role:  | End time          |

#### INTRODUCTION

Thank you for agreeing to meet today. For this interview, we are interested in learning about your perceptions about vaping at your school and in getting feedback about the CATCH My Breath vaping prevention curriculum that you delivered to students at your school.

As a reminder, this interview will be recorded to accurately capture our conversation in its entirety. Any responses you give during this interview will be kept confidential and will in no way be linked to your name in any subsequent reports. Please also note that you are not required to respond to any question that you feel uncomfortable answering. If there is anything you would prefer to skip, please just let me know and we will move on to the next topic. [if online: You can stop participating in this interview at any time by simply closing your web browser.]

Do you have any questions before we begin the interview?

Okay great! I will go ahead and start recording and we will begin.

**\*\* START RECORDING \*\***

#### INTRODUCTION (~5 minutes)

To start things off, tell me a little bit about your role and the responsibilities you hold at your school.

- PROMPT: About how long have you been in education? How long have you been at this school?
- PROBE: What classes do you teach? Are you part of or lead any extracurricular activities at this school?

#### PROGRAM FEEDBACK (20-30 minutes)

I'd like to spend some time talking about your experience delivering the CATCH My Breath vaping curriculum at your school. How difficult or easy was it to deliver the curriculum?

- PROBE: What made it difficult or easy to deliver?
- PROBE: How do you think it could be revised to be easier to deliver?

What did you think about the length of the lessons?



- PROBE: Were they too long? Too short? Too many? Too few? What future recommendations do you have?

**What did you think about the scope (or appropriateness) of the lessons?**

- PROBE: In your opinion, what do you think are the core components of the program? Which ones do you think are adaptable?
- PROBE: How well did they align with the Ontario curriculum?
- PROBE: What aspects do you think are presently missing?
- PROBE: What components did you like best and why?
- PROBE: What components did you dislike most and why?
- PROBE: Did you think the content of the program was appropriate for all students in your class? (for example, students with learning disabilities, English as a Second Language students)

**What did you think of the quality and validity of evidence provided in the curriculum?**

- PROMPT: Was it believable to you? Was it believable to the students?

**What did you think about how the curriculum was bundled, presented, and assembled?**

- PROBE: What parts were appealing to students? What parts were less appealing (or boring)?
- PROBE: What did you think about the training that was provided? Was it adequate? Too long? Too little?

**What do you think about the cost of the curriculum? Is it too much, too little?**

- NOTE: Curriculum is \$300/user/year

**Do you think the curriculum was effective at preventing students from starting vaping? Why or why not?**

**STUDENT POPULATION (if time, ~10 minutes)**

**I'd like to talk about your school's student population. How would you describe the students at your school? What types of students attend your school?**

- NOTE: listen for environment, demographics, school culture, etc.
- PROBE: How would you say your school compares to other schools in Ontario? How similar or dissimilar is it?
- PROBE: What are the needs of students at your school? Do you see any gender and/or race-based differences in students' needs?

**How many students at your school do you think vape? What types of students do you think vape?**

- PROBE: Do you think there are any gender or ethnic differences when it comes to vaping?
- PROBE: What do you think they are usually vaping? Nicotine or marijuana?
- PROBE: What types of devices do you see them using?

**According to you, why do you think students use substances like cigarettes, vapes, or marijuana?  
Please feel free to give examples.**

- PROBE: would you say substance use among students has changed (increased or decreased) over the past year? YES/NO and why?

**OTHER RESOURCES (if time, ~15 minutes)**

**How important is vaping prevention at your school? How important is vaping prevention to you?**

**How supportive is administration for implementing vaping prevention programs? How supportive are other teachers?**

- PROBE: What barriers might there be to implementing vaping prevention programs at your school? How could we mitigate those barriers?
- PROBE: What are the enablers in implementing vaping prevention programs at your school? How do you think we can use these facilitators to implement vaping prevention programs?

**I'd like to learn a bit more about other resources at your school. This could include programs, policies, or people. What other resources are available at your school to support vaping prevention or cessation?**

- PROBE: Do you know of any programs delivered by a Public Health Nurse at your school or by your Public Health Unit?
- IF PROGRAMS: Describe the program(s). What topics do these programs cover? Who delivers them? How often are they delivered? How are they different from 'CATCH My Breath'?
- IF POLICIES: Describe the policies. Who enforces the policies? What are the consequences for students caught violating the policies?
- IF PEOPLE: Describe the role(s) and responsibilities of these people.
- IF NONE: What other vaping prevention programs have you heard about?

**As a final question, do you have anything else you'd like to share with me about substance use programming or student vaping at your school?**

**CLOSING**

Thank you for taking the time to meet with me. Your valuable input will help to improve the CATCH My Breath vaping prevention curriculum for other teachers across the province.

As a reminder, all responses you gave in today's interview will be kept confidential. Any responses used in reports will not be linked to your identity as a participant. I will stop the recording now.

**\*\* STOP RECORDING \*\***

Thank you again for your time. I hope you have a great day and if you have any questions please do not hesitate to contact me via email or the phone number included in our communications.

## Appendix C

### Focus Group Moderator Guide - Students

|                      |                  |
|----------------------|------------------|
| School name:         |                  |
| Date of focus group: | Moderator name:  |
| Start time:          | Note taker name: |
| End time             |                  |

#### INTRODUCTION

**NOTE:** Given time to (1) review and sign Assent Forms, (2) review and sign confidentiality agreements, (3) complete Focus Group Survey

Welcome! Thank you for agreeing to be a part of this focus group today. We are interested in learning about your perceptions about vaping at your school and in getting feedback about the CATCH My Breath vaping program that you took part in.

As a reminder, we will be recording the conversations during this focus group so that we do not miss any important and interesting information when we are going over the responses later. Any specific comments that you give during this focus group will be kept confidential and will in no way be linked to your name in any later reports. Please also note that you are not required to respond to any question that you feel uncomfortable answering. [if online: You can stop participating in this focus group at any time by simply closing your web browser.]

Please speak one at a time so we can hear everyone's responses, and please make sure to be respectful of each other – all comments are valuable and important. There are no right or wrong answers. It's okay to disagree – everyone has different opinions.

In order to maintain the confidentiality of your peers, please keep our conversations today private. This means that you should not talk about what other people have said during the focus group after it is done.

Do you have any questions before we begin the focus group?

Okay great! I will go ahead and start recording and we will begin.

**\*\* START RECORDING \*\***

#### INTRODUCTION & BACKGROUND (~5 minutes)

**\*\*Let's start off by getting to know each other. When we go around the table, please tell us your name (or what you'd like to be called today), what grade you're in, and your favourite book or TV show.**

- NOTE: Alternative: your favourite hobby or extracurricular activity

**\*\*Our conversation today is going to focus on vaping and your thoughts about the CATCH My Breath vaping program that you did in class a couple of weeks ago. To start off, when you hear the word vape, what comes to mind? Describe the types of products that you think of.**

- PROBE: How common is it to use this word?
- PROBE: Which of these devices would you call vapes? [*show photo*] Which devices are not vapes? What makes them not vapes?
- PROBE: What is the difference between e-cigarettes and vapes?
- PROBE: What other words do students use to refer to or describe these devices?

**\*\*What devices do you see around campus? What do you think is being used in them?**

- PROBE: How do you know what's being used in them?
- Note: Students can use the photo to show the devices they've seen

**\*\*Why do you think students use vapes?**

## PROGRAM FEEDBACK (30-40 minutes)

**\*\*I'd like to spend some time talking about your experience with the CATCH My Breath vaping program. What was one thing that you learned or that stood out to you from the lessons?**

- PROMPT: What was something you learned that was surprising to you?
- PROBE: What do you think are some key points from the lessons?

**\*\*What do you still have questions about after going through the lessons? Do you think something was missing from the lessons?**

**\*\*What did you like the best about the lessons? Why?**

**\*\*What did you dislike about the lessons? Why?**

- PROMPT: What parts did you find boring in the lessons?

**\*\*What did you think of the quality and validity of evidence provided in the lessons?**

- PROMPT: Was it believable to you?
- PROBE: What information was not believable to you? What did you think was the least believable information presented?

**\*\*If you could design a vaping prevention program for students your age, what would it include?**

- PROMPT: What topics would you include? What activities would you include?

Who do you think the lessons are targeted to? What types of students? Why?

- PROBE: Do you think this information is appropriate for students your age? If not, what age?

Do you think the program will be effective at preventing students from starting vaping? Why or why not?

## TERMINOLOGY (10 minutes, if time)

**\*\*I'd like to take a few minutes to switch topics and talk about the different terminology people use to refer to different products. When you hear the word e-cigarette, what comes to mind? Describe the types of products that you think of.**

- PROBE: How common is it to use this word?
- PROBE: Which of these devices would you call e-cigarettes? [*show photo*] Which devices are not e-cigarettes? What makes them not e-cigarettes?

I'd like to talk about the students at your school. How would you describe the students at your school? What types of students attend your school?

- NOTE: listen for environment, demographics, school culture, etc.
- PROBE: How would you say your school compares to other schools in Ontario? How similar or dissimilar is it?

## SCHOOL POLICIES (if time)

I'd like to learn a bit more about the vaping policies at your school. What are the rules about vaping at your school?

- PROBE: Who enforces the rules? What are the consequences for students caught violating the rules?

**\*\*We've covered a lot of ground on this topic. As a final question, is there anything else you'd like to share with me about the CATCH My Breath program or student vaping at your school?**

## CLOSING

Thank you for taking the time to talk with me today. Your valuable input will help to improve the CATCH My Breath vaping prevention curriculum for other students across the province.

As a reminder, all responses you gave in today's focus group will be kept confidential. Please keep our conversations today private. Any responses used in reports will not be linked to your identity as a participant. I will stop the recording now.

**\*\* STOP RECORDING \*\***

Thank you again for your time. I hope you have a great day and if you have any questions please do not hesitate to contact me via email or the phone number included in our communications

Images of devices



1



2



3



4



5



6



7



8



9



10



11



12



13



14



15



16



17



18



19



20



21



22



23



24



25



## Appendix D

**Table 8.** *Main themes from the presenter interviews*

| <b>Topic</b>            | <b>Main themes</b>                            |
|-------------------------|---|
| Program delivery        | Facilitators                                  |
|                         | Challenges                                    |
| Program content         | Appeal of the program                         |
|                         | Appropriateness of the content                |
|                         | Comprehensiveness of the program              |
|                         | Suggestions for change                        |
| Facilitator training    | Adequate                                      |
|                         | Inadequate                                    |
| Cost                    | Too costly                                    |
|                         | Worth the cost                                |
|                         | Who should pay                                |
| Perceived effectiveness | Increased student knowledge                   |
|                         | Less effective for students who already vaped |
|                         | Provide this information in earlier grades    |

## Appendix E

**Table 9.** *Main themes from the student focus groups*

| <b>Topic</b>                   | <b>Main themes</b>                     |
|--------------------------------|--|
| What stood out                 | Vape ingredients                       |
|                                | Health effects of vapes                |
|                                | Vaping industry tactics                |
|                                | Nothing                                |
| Appealing                      | Interactivity                          |
|                                | Reflection                             |
|                                | Informative                            |
|                                | Structure                              |
| Unappealing                    | Inaccurate                             |
|                                | Unrealistic                            |
|                                | Uninteresting                          |
| Lesson appropriateness         | Appropriate                            |
|                                | Inappropriate                          |
| Who was targeted               | Students                               |
|                                | Those thinking about trying vaping     |
|                                | Adults                                 |
| Credibility of the information | Believable                             |
|                                | Unconvincing                           |
| Comprehensiveness              | Complete                               |
| Program effectiveness          | Preventive                             |
|                                | Limited Effect                         |
| Suggestions for change         | Tailoring the presentation             |
|                                | Negative health effects                |
|                                | Homework assignments                   |
|                                | Changes to the presentation of content |

## Appendix F

**Table 10.** Demographic and behavioural characteristics of the baseline linked and unlinked samples of students, n=311 students

| Characteristic                                | Linked<br>n=116 | Not linked<br>n=195 | Chi-square<br>test             |
|---|-----------------|---------------------|--------------------------------|
|   | % (n)           | % (n)               |                                |
| Grade   |                 |                     | 4.426 (2),<br>p=0.109          |
| 9   | 94.8 (110)      | 87.7 (171)          |                                |
| 10  | 5.2 (6)         | 11.8 (23)           |                                |
| 12  | 0.0 (0)         | 0.5 (1)             |                                |
| Gender  |                 |                     | <b>12.559 (2),<br/>p=0.002</b> |
| Boy   | 32.8 (38)       | 53.3 (104)          |                                |
| Girl  | 60.3 (70)       | 41.0 (80)           |                                |
| Other   | 6.9 (8)         | 5.6 (11)            |                                |
| Ethnicity                                     |                 |                     | 0.557 (1),<br>p=0.455          |
| White   | 66.1 (76)       | 61.9 (120)          |                                |
| Other/Mixed                                   | 33.9 (39)       | 38.1 (74)           |                                |
| Parents, step-parents, or guardians that vape |                 |                     | 0.383 (1),<br>p=0.536          |
| Yes   | 13.0 (15)       | 15.6 (30)           |                                |
| No / I don't know                             | 87.0 (100)      | 84.4 (162)          |                                |
| Brothers or sisters that vape                 |                 |                     | 1.597 (2),<br>p=0.450          |
| Yes   | 14.9 (17)       | 17.2 (33)           |                                |
| No / I don't know                             | 73.9 (85)       | 75.5 (145)          |                                |
| No brothers or sisters                        | 11.3 (13)       | 7.3 (14)            |                                |
| Close friends that vape                       |                 |                     | 3.283 (2),<br>p=0.194          |
| None of them                                  | 46.1 (53)       | 37.0 (71)           |                                |
| Some of them                                  | 41.7 (48)       | 44.8 (86)           |                                |
| Most / All of them                            | 12.2 (14)       | 18.2 (35)           |                                |
| Vaping status <sup>a</sup>                    |                 |                     | <b>7.904 (3),<br/>p=0.048</b>  |
| Never vaped, not susceptible to future vaping | 39.1 (45)       | 26.9 (52)           |                                |
| Never vaped, susceptible to future vaping     | 41.7 (48)       | 42.5 (82)           |                                |
| Tried vaping, but does not currently vape     | 7.8 (9)         | 8.8 (17)            |                                |
| Currently vapes                               | 11.3 (13)       | 21.8 (42)           |                                |
| School location (in Ontario)                  |                 |                     | 4.590 (2),<br>p=0.101          |
| North   | 28.5 (33)       | 20.8 (41)           |                                |
| Central                                       | 36.2 (42)       | 32.0 (63)           |                                |
| East  | 35.3 (41)       | 47.2 (93)           |                                |

<sup>a</sup> Students classified as “not susceptible to future vaping” responded “Definitely not” to survey questions about being curious about vaping, vaping if their best friend offered them a vape, and vaping during the next year. Students classified as “susceptible to future vaping” responded “Probably not”, “Probably yes”, or “Definitely yes” to these questions. Students who “currently vape” reported any vaping in the past 30 days.

### F.1 Supplementary analysis

The following supplementary analyses compare the demographic and behavioural characteristics and assess changes in knowledge and attitudes towards vaping of all students who completed surveys at baseline and follow-up, regardless of whether they could be linked over time. These

analyses assume that the samples are independent, although some students completed both surveys ( $n = 116$ , as shown in the analyses in Table 5).

Table 11 compares the demographic and behavioural characteristics of the baseline and follow-up samples of students. There was a significant difference in the gender distribution of the baseline and follow-up samples; fewer boys completed the follow-up survey. No other characteristics were significantly different between the baseline and follow-up samples.

**Table 11.** Demographic and behavioural characteristics of the baseline and follow-up samples of students,  $n=431$  students <sup>a</sup>

| Characteristic                                | Baseline<br>n=310 | Follow-up<br>n=232 | Chi-square<br>test            |
|---|-------------------|--------------------|-------------------------------|
|   | % (n)             | % (n)              |                               |
| Grade   |                   |                    | 1.485 (1),<br>p=0.223         |
| 9   | 90.7 (281)        | 93.5 (217)         |                               |
| 10  | 9.4 (29)          | 6.5 (15)           |                               |
| Gender  |                   |                    | <b>8.249 (2),<br/>p=0.016</b> |
| Boy   | 45.8 (142)        | 33.6 (78)          |                               |
| Girl  | 48.4 (150)        | 58.6 (136)         |                               |
| Other   | 5.8 (18)          | 7.8 (18)           |                               |
| Ethnicity                                     |                   |                    | 0.429 (1),<br>p=0.513         |
| White   | 63.1 (195)        | 60.3 (140)         |                               |
| Other / Mixed                                 | 36.9 (114)        | 39.7 (92)          |                               |
| Parents, step-parents, or guardians that vape |                   |                    | 2.186 (1),<br>p=0.139         |
| Yes   | 14.7 (45)         | 19.6 (44)          |                               |
| No / I don't know                             | 85.3 (261)        | 80.4 (181)         |                               |
| Brothers or sisters that vape                 |                   |                    | 2.579 (2),<br>p=0.275         |
| Yes   | 16.3 (50)         | 18.7 (42)          |                               |
| No / I don't know                             | 74.8 (229)        | 76.0 (171)         |                               |
| No brothers or sisters                        | 8.8 (27)          | 5.3 (12)           |                               |
| Close friends that vape                       |                   |                    | 1.520 (2),<br>p=0.468         |
| None of them                                  | 40.2 (123)        | 39.6 (89)          |                               |
| Some of them                                  | 43.8 (134)        | 40.4 (91)          |                               |
| Most / All of them                            | 16.0 (49)         | 20.0 (45)          |                               |
| Vaping status <sup>b</sup>                    |                   |                    | 1.456 (3),<br>p=0.693         |
| Never vaped, not susceptible to future vaping | 31.4 (96)         | 30.4 (69)          |                               |
| Never vaped, susceptible to future vaping     | 42.5 (130)        | 42.3 (96)          |                               |
| Tried vaping, but does not currently vape     | 8.5 (26)          | 11.5 (26)          |                               |
| Currently vapes                               | 17.7 (54)         | 15.9 (36)          |                               |

<sup>a</sup> Number of unique students completing a survey at baseline and/or follow-up.  $n = 116$  students were linked at baseline and follow-up

<sup>b</sup> Students classified as “not susceptible to future vaping” responded “Definitely not” to survey questions about being curious about vaping, vaping if their best friend offered them a vape, and vaping during the next year. Students classified as “susceptible to future vaping” responded “Probably not”, “Probably yes”, or “Definitely yes” to these questions. Students who “currently vape” reported any vaping in the past 30 days.

## F.2 Short-term changes in knowledge of the risks of vaping

As shown in Table 12, there were positive changes in knowledge after being exposed to the CMB curriculum. Based on Chi-square tests, significantly more students responded correctly to all of the statements at follow-up. These results are similar to those obtained using the linked sample of students (Table 6).

**Table 12.** Percentage of students <sup>a</sup> responding correctly to statements about vaping at baseline (n=303) and follow-up (n=221)

| Vaping statement  | % responding correctly at baseline (n) | % responding correctly at follow-up (n) | % change | p-value          |
|---|--|---|----------|------------------|
| Nicotine is addictive   | 94.4 (286)                             | 98.2 (217)                              | +3.8     | <b>0.029</b>     |
| When you are addicted to something you lose control   | 75.6 (229)                             | 87.8 (194)                              | +12.2    | <b>&lt;0.001</b> |
| E-cigarette vapour contains mostly water  | 42.2 (128)                             | 79.2 (175)                              | +37.0    | <b>&lt;0.001</b> |
| Most vapes, including JUUL, contain nicotine  | 81.9 (248)                             | 95.0 (210)                              | +13.1    | <b>&lt;0.001</b> |
| Most sweet flavoured vapes contain nicotine   | 77.9 (236)                             | 95.0 (210)                              | +17.1    | <b>&lt;0.001</b> |
| It is illegal for teens under the age of 19 to buy vapes  | 77.2 (234)                             | 87.8 (194)                              | +10.6    | <b>0.002</b>     |
| Direct pressure is advertising that everyone knows is paid for by the tobacco or e-cigarette industry on billboards, magazines, television, and on the internet | 29.0 (88)                              | 57.9 (128)                              | +28.9    | <b>&lt;0.001</b> |
| Indirect pressure is advertising that hides who paid for the advertising and often doesn't even look like advertising   | 32.0 (97)                              | 60.6 (134)                              | +28.6    | <b>&lt;0.001</b> |
| Putting someone down for vaping is not a smart refusal strategy   | 42.6 (129)                             | 62.4 (138)                              | +19.8    | <b>&lt;0.001</b> |

<sup>a</sup> Students with complete data

### F.3 Short-term changes in attitudes towards vaping

Survey results also indicate some positive changes in attitudes and perceptions of social norms regarding vaping (Table 13). Based on Chi-square tests, significantly more students thought that they would “get addicted” if they vaped at follow-up. Furthermore, significantly fewer students agreed with the statements “Most people my age vape” and “Most people in high school vape”. These results are similar to those obtained using the linked sample of students (Table 7).

**Table 13.** Percentage of students <sup>a</sup> agreeing to statements about vaping at baseline (n=297) and follow-up (n=212)

| Vaping statement: If I were to use an e-cigarette or vaping device... | % agree at baseline (n) | % agree at follow-up (n) | % change | p-value      |
|---|-------------------------|--------------------------|----------|--------------|
| I would like it   | 24.6 (73)               | 28.3 (60)                | +3.7     | 0.346        |
| I would enjoy the taste   | 39.1 (116)              | 45.8 (97)                | +6.7     | 0.131        |
| I would feel less stressed  | 30.6 (91)               | 31.6 (67)                | +1.0     | 0.817        |
| I would have fun using it   | 32.7 (97)               | 29.7 (63)                | -3.0     | 0.481        |
| I would be more popular   | 14.8 (44)               | 12.3 (26)                | -2.5     | 0.410        |
| I would worry about my health   | 85.2 (253)              | 88.2 (187)               | +3.0     | 0.326        |
| I would get addicted  | 68.0 (202)              | 76.9 (163)               | +8.9     | <b>0.028</b> |
| I would get in trouble with my teachers                               | 76.1 (226)              | 79.3 (168)               | +3.2     | 0.402        |
| I would let my parents down   | 87.5 (260)              | 86.3 (183)               | -1.2     | 0.686        |
| My friends would avoid me   | 33.0 (98)               | 38.7 (82)                | +5.7     | 0.186        |
| I would be a bad role model   | 86.9 (258)              | 86.3 (183)               | -0.6     | 0.858        |

|                                  |            |            |      |              |
|----------------------------------|------------|------------|------|--------------|
| Most people my age vape.         | 81.5 (242) | 73.6 (156) | -7.9 | <b>0.033</b> |
| Most people in high school vape. | 85.5 (254) | 77.4 (164) | -8.1 | <b>0.018</b> |

<sup>a</sup> Students with complete data