DEVELOPING A WEB TOOL TO SUPPORT YOUTH TOBACCO CONTROL

by

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AUTHOR'S DECLARATION FOR ELECTRONIC SUBMISSION OF A THESIS

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Objective: This study was designed to inform the development of a web tool to simplify access to and analysis of available evidence for youth tobacco control. This tool will support planning, evaluation and research related to youth tobacco control. Primary objectives were to examine useful functions and characteristics of potential end-users.

Methods: A pilot-tested, web-based questionnaire was administered to potential end-users (N=43). A purposeful sample of participants was selected to represent individuals working in youth tobacco control from research, health, and education sectors in Western, Central, and Eastern Regions of Canada. Data were analyzed using frequency calculations and cross-tabulations by sector. Results guided the creation of a prototype. Interviews were conducted with a subset of participants (N=6) to validate the prototype and identify further functions. Data were analyzed using content analysis.

Results: Useful functions of the prototype identified varied slightly across sectors. Research participants felt that access to raw data was a useful function. Health sector practitioners were interested in accessing data and creating summary reports of data. Educators were mostly interested in obtaining summary information from data, through reports. Further, health and research participants felt the information resources function was redundant. This research has provided important insights that will guide the development of a functional web tool.

Implications: This tool can enable users to identify effective interventions, track the progress of school or health regions relative to benchmarks, and identify high risk schools or communities to target intervention efforts. This tool is an innovative way to maximize the use of available resources to link research, policy, and practice.

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Dedication

I dedicate this thesis to my family for their love and unwavering faith that has been a constant source of strength and motivation. To my parents, Ricardo and Maria Pia Morales whose hard work and sacrifices have made it possible for me to pursue a Master's degree; to my siblings, Ricardo Jr. and Maria Pia Jr. who have always been there willing to lend a listening ear or a helping hand; and lastly to my grandmother, Miguelina Antola who inspired me to set high goals and achieve them.

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1.0 Rationale

Three notable chronic diseases (cancer, cardiovascular disease, and diabetes) are largely preventable by modifying three shared risk behaviors: tobacco use, inactivity, and poor nutrition. Slightly fewer than 5 million Canadians smoke (CTUMS, 2005), accounting for 45,000 premature deaths per year (Makomaski, Illing & Kaiserman, 2000). World-wide, tobacco use accounts for 4.8 million premature deaths per year (Mackay, Eriksen, Shafey, 2006). The prevalence of tobacco use alone presents a significant opportunity to improve population health through widespread behavior change.

Tobacco use is not limited to adults. Results from the 2002 Youth Smoking Survey indicate that 25% of surveyed youth in grades 5-9 have tried a tobacco product (Youth Smoking Survey, 2005). In fact, the majority of current adult smokers began smoking in adolescence. The earlier young people begin using tobacco, the more heavily they are likely to use it as adults, and the longer potential time they have to be users. Both the duration and the amount of tobacco use are related to eventual chronic health problems (Preventing Tobacco Use Among Young People, 1994). Given these concerns, youth tobacco control efforts are necessary.

Population-level interventions are required to effectively reduce the prevalence of these core risk behaviors. Evidence to inform population-level interventions cannot be solely based on randomized controlled trials, because communities cannot be readily assigned to different policy conditions or programs. Rather, to learn from experience, we must take advantage of sources of knowledge in the natural environment (i.e., existing policies and programs). We can describe this as studying "natural experiments".

A team of researchers at the Canadian Cancer Society/National Cancer Institute of Canada's Centre for Behavioural Research and Program Evaluation have created the School

Health Action Planning and Evaluation System (SHAPES). SHAPES is an innovative system that provides capacity for rapid and cost-effective local data collection and feedback. SHAPES can build capacity to study "natural experiments". Currently modules addressing tobacco use, physical activity and eating behaviours exist. All modules contain items with content relevant to multiple stakeholders.

The vision for SHAPES is broader. Enabling access to and analysis of SHAPES data has potential implications for stakeholders in research, health (local, provincial, and national levels), and education. For example, if schools had a web interface to access their own data and draw comparisons to other schools with similar characteristics, they may get a better sense of what these data mean for their school. Similarly, if they could extract data for student projects, it makes those projects more real for their students. Public health professionals may want to ask questions of data from schools in their region - questions that group the data in different ways than available in the feedback report. Researchers may want access to data to conduct secondary analyses. Clearly, a web tool to facilitate access to and analysis of SHAPES data can maximize the use of this rich data source and create an excellent opportunity to align research with practice by providing decision-makers with easy access to information and data that will support their work with respect to youth tobacco control.

2.0 Background

2.1 School Health Action, Planning, and Evaluation System (SHAPES)

SHAPES consists of three basic components: (1) a machine-readable questionnaire (Appendix A); (2) a quality controlled scanning process; (3) and a computer generated feedback report released to the school to support planning and evaluation of programs and policies (Appendix B). This section describes the rationale and development of SHAPES, the community response to SHAPES, the value added by SHAPES, and the future of SHAPES.

2.1.1 Rationale

The motivation to develop SHAPES as a local data collection system resulted from the convergence of three forces (Cameron et al, in press). First, results of a randomized controlled trial indicated that social influences prevention programs recommended as best practice by the US Surgeon General (Reducing Tobacco Use, 2000) were ineffective in most schools. A strong positive effect in high risk schools (high smoking rate among senior students) was concealed by no effects in low-risk schools, yielding no overall effects in pooled analyses (Cameron, Brown, Best, Pelkman, Madill, Manske & Payne, 1999). Results suggested that maximizing population impact most economically can best be achieved by selectively targeting high risk schools. Thus, a tool to identify high risk schools was required.

Second, an emerging recognition that context influences the effects of population-level interventions, such that the same intervention can produce different outcomes under varying conditions created the need for a simple and effective method to characterize populations (Glasgow, Lichtenstein & Marcus, 2003; Green, 2001).

Lastly, communities often apply untested interventions, sometimes with excellent results (Bauer, Johnson, Hopkins & Brooks, 2000). Since no adequate measures for evaluation exist, results of these community interventions are usually unknown. A simple tool to evaluate these interventions was needed to create capacity to learn from community-led initiatives (Green, 2006).

2.1.2 Developing the Smoking Behaviours Module

Prior to the development of SHAPES, all 37 public health units in Ontario were surveyed to gauge interest in a local data collection system. Enthusiastic support by the health units led to the development of a Smoking Behaviour Module (formerly known as the School Smoking Profile), in partnership with an advisory group of community stakeholders. Items on this module address tobacco use, attitudes, and contextual influences.

Reliability and validity testing on the Smoking Behaviour Module of SHAPES yielded satisfactory results. Testing included a study determining that community-level data collection does not underestimate school-level prevalence (Cameron, Brown, Manske, Jolin & Madill, Submitted).

2.1.3 Community Response

Demand for SHAPES has been strong. Since the year 2000, the Smoking Behaviours Module has been administered in 906 Canadian schools in 10 provinces with over 228,000 students participating. SHAPES has been well received by educators, students and community health staff and demand for this tool has increased (Jolin, et al., 2004). A primary reason for this strong demand is the feedback reports schools receive within 6-8 weeks of data collection. These reports compare school smoking rates with current national/provincial rates and provide

information on purchasing behaviours and environmental tobacco smoke. Health Canada contracted to have SHAPES used to collect data for the 2004-2005 Youth Smoking Survey, Canada's major school-based youth tobacco surveillance. Health Canada's rationale for choosing SHAPES was to increase the school level participation rate to collect the best possible surveillance data. Feedback reports used in SHAPES encourage participation by providing schools with added value at minimal added cost.

2.1.4 Value Added by SHAPES

SHAPES can be used in several ways. Since it collects data from all students in eligible grades in a school, it enables the evaluation and targeting of local-level (school, community) youth tobacco control intervention efforts. Feedback of local data can help stakeholders engage media to bring youth public health issues onto the public agenda (Cameron, et al., in press).

Further, central scanning of questionnaires presents the possibility of creating a national database to serve multiple purposes. First, a national database can enable the identification of effective interventions year-to-year, creating capacity for practice-based evidence (Green, 2006). Second, it can allow schools or communities to track their progress, relative to other communities, thus identifying benchmarks and building motivation. Third, it can support clinical trial studies by providing a simple means to: (1) identify schools based on their characteristics; (2) match schools using SHAPES data; and (3) access existing (pre-baseline) data on schools (Cameron, et al., in press). Creating this national database is a priority. Further, developing a web tool to facilitate access to and analysis of this rich repository of data can support the work of multiple stakeholders in youth tobacco control.

2.1.5 Future of SHAPES

Given the popularity of the SHAPES Smoking Behaviours Module, additional modules addressing health behaviours of interest to stakeholders (e.g., schools) continue to be developed. Currently, validated Smoking Behaviours and Physical Activity modules exist (Wong, Leatherdale & Manske, in press), while an Eating Behaviour module is under development (Leatherdale, Manske, Wong & Cameron, submitted). Thus, SHAPES is providing capacity to collect evidence related to a variety of health behaviours.

Providing relevant stakeholder groups (i.e., individuals working in public health, education, and research) with easy access to these data can help support their work related to youth tobacco control, and eventually other health behaviors. Thus, a web-based tool to facilitate access to and analysis of SHAPES data could be a valuable addition to the SHAPES system.

2.2 Information Technology Knowledge Translation and Exchange

Geographical and virtual communities hold large repositories of information that could be shared and continuously built upon by all community members. Sharing information can allow communities to learn from the experience of others and develop a collective knowledge base beyond anything that could be accomplished by individuals alone. Technology to support these efforts currently exists, but many communities fail to take full advantage of advanced information technology to interact and exchange knowledge. While traditional Web sites are commonly used, advanced forms of technology available, such as interactive databases and geographical mapping, remain underutilized (Cowan, Mayfield & Tompa, 1998).

Reasons for this often relate to cost and complexity of technologies, real or perceived. Many organizations lack the technical expertise required to develop and maintain technical

applications. Further, few organizations have sufficient financial resources for software and technical personnel. Management of content within technical applications, such as collecting and updating information, is another key concern (Mitchell, Silberman, Klawe, Liauw, Wigglesworth & Posner, 2005).

Advanced technology carries the potential to transform public health practice by creating infrastructure for unprecedented knowledge exchange. This would increase capacity for a system that supports evidence-based practice and practice-based evidence (Green, 2006). However, concerns including cost and sustainability of these technologies need to be addressed.

2.3 Web Informatics Development Environment (WIDE)

Researchers at the Computer Systems Group (CSG) at the University of Waterloo have created a software toolkit to support the development and deployment of Web-based portals (called "Community Learning Spaces"). This toolkit, known as the Web Informatics Development Environment (WIDE), aims to overcome common barriers to technology uptake by communities lacking the financial and technical resources to develop and implement information systems.

WIDE facilitates the design, construction, deployment, maintenance, and operation of complex Web-based systems in a number of ways. First, WIDE nearly eliminates the need for 'programming' by using declarative methodology, thus enabling a "wizard approach" to construct Web-based systems. Second, WIDE allows new applications to be developed quickly to keep up with fast-paced environments. Third, WIDE supports documentation of technical information and best practices through a management system. Further, WIDE consists of a number of service frameworks that enable various functions. Mapping, diagramming, report

generating, and Web and database searching functions are among the service frameworks provided by WIDE (Cowan, Fenton & Mulholland, 2005).

WIDE has been used to develop Community Learning Spaces in a variety of fields. Examples include applications to support rural and urban community information (The Rural Switchboard; http://learningspace.uwaterloo.ca/rs), arts and culture (Waterloo Regional Arts Council; http://learningspace.uwaterloo.ca/wrac), economic development (Canada's Technology Triangle; http://learningspace.uwaterloo.ca/ctt-not public), and health (Health Informatics; http://hi.uwaterloo.ca).

WIDE is a friendly technology that allows a broad range of functionalities, making it a useful toolkit to support the development of a web tool to facilitate access to and analysis of SHAPES data.

2.4 Communities of Practice

Wenger and Lave coined the term "communities of practice" while studying apprenticeship as a learning model. They found that an apprentice not only learns from the relationship with their mentor, but rather by being immersed in a *community* that shares common *practices*. This concept can be illustrated by applying it to an example of a relationship between a graduate student and their supervisor: a student does not acquire all their knowledge through interacting with their supervisor, but rather through sharing in common tasks and solving common problems (e.g., drafting a thesis proposal) with other community members (e.g., graduate students).

Wenger defines communities of practice (CoP) as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, 1998, pg. 11). Clearly, individuals with interest in youth tobacco control share a

passion and would benefit from having the opportunity to learn from each other through regular interaction. Wenger argues that there are three critical components that comprise a CoP. These components and their application to individuals working in youth tobacco control are discussed below.

2.4.1 The Domain

The first essential component of a CoP is an identifiable, shared domain of interest. Membership in a CoP, therefore, implies a commitment to the domain and a shared competence that characterizes members (Wenger, 1998).

Individuals across Canada working in youth tobacco control (e.g., public health professionals, researchers, educators) share an identifiable domain of interest and are committed to advancing youth tobacco control efforts.

2.4.2 The Community

The second component of a CoP is interaction with other members of the community Thus, in pursuing their interest in a shared domain (e.g., youth tobacco control), members of a CoP must have opportunities to share ideas and information. This is consistent with literature in the field of knowledge translation and uptake (KTU) that indicates that intensive, sustained interaction is required to achieve KTU (Kramer & Cole, 2003). Through these interactions, members can build relationships and learn from each other. Further, membership is defined through participation and contribution to the community. People can participate in different ways and to different degrees. New members enter a CoP and become acculturated to their new environment through peripheral participation (Lave & Wenger, 1991). This gradual process begins through participation in a CoP as a relative outsider. As an individual becomes

accustomed to the practices of the community they take a more active role, eventually becoming a core member and contributing to shape these practices.

Currently, opportunities for individuals with interest in youth tobacco control to share their ideas and information exist, but have limitations. An example of such an opportunity is the National Conference on Tobacco or Health. While conferences provide excellent venues to make new contacts, they are usually infrequent and unable to support day to day, sustained interactions. Further, these opportunities are often not directly pertinent to local context, particularly international conferences. Lastly, information presented through conferences is often focused primarily on scientific and not experience- or practice-based evidence (Green, 2006).

The proposed SHAPES web tool can address limitations noted above and provide a platform for the Canadian youth tobacco control community to connect, share ideas, and learn from each other to advance tobacco control efforts at the local, provincial and national levels.

2.4.3 The Practice

The final component of a CoP is that members develop a shared practice, which may include shared resources, experiences, tools, and methods of addressing problems. This takes time and sustained interaction.

The proposed SHAPES web tool can provide a forum to help support Canadians working in youth tobacco control to develop a shared practice by providing opportunities for users to share their experiences and resources. Over time, the SHAPES web tool could collect many shared experiences to develop substantial practice-based evidence (Green, 2006).

The combination of the domain, the community and the practice are the key elements that constitute a CoP. The proposed SHAPES web tool can foster the creation of a CoP by providing

a platform for individuals with a shared interest in youth tobacco control to learn from the experiences of others and develop common resources and methods for addressing tobacco issues.

2.5 Framework for the Development of an Information System

Literature in the field of systems engineering is extensive. A significant proportion of this literature focuses on the development of expert systems. These applications aim to perform tasks otherwise performed by human experts in a variety of fields. For example, expert systems are capable of diagnosing human illnesses, making financial forecasts, and scheduling routes for delivery vehicles. Some systems are designed to assist human experts, while others are intended to replace them.

A smaller body of literature focuses on information systems. A review of the literature on development of information systems revealed that despite the growing popularity of these systems in public health, no complete framework currently exists to inform their development. Attempts have been made to analyze and revise conceptual frameworks commonly applied in traditional systems engineering (expert system development) to tailor them for use in the development of public health information systems (Hallberg, Timpka & Eriksson, 1999; Samaras & Horst, 2005). While the revised frameworks presented in the literature have overlapping features, there is no firm consensus for a gold standard approach. The appropriate approach in a given situation depends heavily on the goals of the system and the characteristics of end users; both of which are situation-specific (Samaras & Horst, 2005). Critical elements presented in most frameworks examined are the adoption of a user-centered and iterative approach in the development process (Samaras & Horst, 2005; Nielsen, 1993; Brender & McNair, 2001; Johnson, Johnson & Zhang). Since no definitively appropriate framework could be discerned from the literature, key elements identified in the literature were combined to create a step-by-

step guide to development. The emergent conceptual framework presented describes one approach to develop an information system. Given the unique nature of information systems, this approach is intended to serve as a guide to development. The framework presented provides context for this research.

The proposed framework consists six major phases: (1) a joint needs assessment and user analysis focusing on stakeholders' information needs and identifying important characteristics of potential users; (2) translation of information needs into system requirements; (3) representational analysis of system requirements; (4) development of system specifications; (5) development of a functional prototype; and (6) system verification and usability testing. This process allows potential-end users to provide input throughout the development process. Critical components of each stage are discussed below. Appendix C outlines potential methods that can be applied at each stage of development.

2.5.1 Needs Assessment and User Analysis

Needs Assessment

The first step of development involves formally investigating the issues facing relevant stakeholders. Examining the needs of target users will ensure that the system developed appropriately meets identified needs and improves existing work processes. The Diffusion of Innovations theory stipulates that the adoption rate of an innovation is directly related to the perceived relative advantage the innovation presents (Rogers, 2003). Thus, it is critical to assess potential end-user needs to design a useful system that significantly improves current practices.

User Analysis

Identifying important attributes of potential users is crucial to guide the design process. Compatibility, another central tenet of the theory of Diffusion of Innovations, refers to the degree

of consistency an innovation has with respect to existing values, past experiences, and the needs of potential adopters (Rogers, 2003). The user analysis serves to identify key user characteristics, which will frame the development process and ensure that the system being developed is appropriately aligned with the characteristics of potential users. This maximizes the likelihood of adoption by intended users.

2.5.2 System Requirements

This phase translates identified user needs from the previous phase into a set of concrete system requirements. If possible, relevant stakeholder groups should validate requirements. Validating system requirements with intended users is a measure that supports a user-centered approach to development.

2.5.3 Representational Analysis

Upon defining system requirements, the focus shifts to identifying ways of displaying information in an appropriate format tailored to potential end-users. This involves identifying ways of representing information which minimize internal problem-solving processes of end-users and facilitate understanding of information presented. In addition, this phase focuses on matching an information display to each user task and tailoring displays according to user characteristics.

2.5.4 System Specifications

Once system requirements and ways to represent them have been identified, system specifications are required. This involves specifying information about the system such as, input data, information to be maintained and processed, data processing techniques, and output data. This is required to determine the technical requirements necessary to implement the system

design. This phase aims to outline detailed procedures to be carried out by the system to satisfy identified system requirements.

2.5.5 Prototyping

This phase involves developing a prototype system. Prototypes must be validated by potential end-users in the next phase of development. When modifications are identified and implemented, the emergent prototype should undergo validation again (Johnson, et al. 2005). This iterative process continues until no significant modifications are identified.

2.5.6 Usability testing

Usability testing is the evaluation component of the development framework proposed. It is applied to determine the ease with which a system is used and to highlight areas for improvement. Usability testing aims to ensure that the system has been developed correctly and adds value by providing an advantage over previous methods.

The following usability criteria ensure that the system is 'easy to use' (Nielsen, 1993):

- Easy to learn
- Easy to remember
- Efficient to use (high level of productivity)
- Minimal technical difficulties (low error rates)
- Stakeholders like using the system (subjective satisfaction)

Usability testing can take several forms. It often involves testing participants who are representative of the target user population as they perform representative tasks. Systematic approaches to usability testing are available in the literature (Nielsen, 1993; Zaff, McNeede & Snyder, 1993; Kushniruk & Patel, 2004).

In summary, SHAPES can potentially provide multiple stakeholders with evidence to support Canadian youth tobacco control efforts. WIDE can support the development a web tool to facilitate access to and analysis of SHAPES data. Further, the proposed SHAPES web tool can potentially help expand the current CoP of Canadians working in youth tobacco-control. This research begins the development of this web tool, using the framework presented above as a guide to development.

3.0 Research Objectives and Research Questions

The proposed framework provides a comprehensive approach to system development. The research presented focused on conducting a joint user analysis and needs assessment by doing the following: (1) identifying the needs and key characteristics of potential users; (2) using this information to develop a system prototype; and (3) obtaining feedback on the prototype.

This research began the development of the web tool using tobacco as an example, by identifying: (1) characteristics of potential end-users; (2) current practices of potential end-users for identifying and using information sources; and (3) the information needs of potential end-users of the system. Results of this research guided the development of a prototype. Prototype feedback was then solicited from potential users.

3.1 Research Objectives: Phase I

The first step in developing the web tool involves examining the information needs and key characteristics of potential end-users. This information is crucial to develop a tool that is useful and improves current practices. The objectives of this phase are as follows:

1. To identify relevant stakeholder groups with interest in youth tobacco control (i.e., potential end-users of the system).
2. To explore current practices for identifying and using information sources to support decision-making with respect to youth tobacco control.
3. To identify information needs of stakeholders to support decision-making with respect to youth tobacco control.
4. To consider key characteristics of potential users to inform development
5. To ensure that the system developed is compatible with user characteristics

3.2 Research Objectives: Phase II

Results from Phase I guided the development of a prototype. Phase II aims to obtain feedback regarding the prototype tool and identify additional functions. The following are research objectives for this phase:

6. To ensure that the prototype web tool is useful to stakeholders.
7. To identify modifications to the tool that will increase its' utility.
8. To identify additional functions of the tool.

3.3 Research Questions: Phase I

The following research questions are directly linked to the objectives outlined for this phase of development:

1. What stakeholder groups have an interest in youth tobacco control, and more specifically, in SHAPES data?
2. What are current practices for obtaining information or data to support decision-making (i.e., targeting intervention efforts, deciding which interventions to implement in which schools)?
3. What information or data do stakeholder groups need to support decision-making with regards to youth tobacco control? Rank according to priority.
4. What is the level of expertise/comfort of intended users with respect to
    - Finding information
    - Performing common computer tasks
    - Statistical manipulation (using spreadsheets and statistical software)
    - Using computer mapping tools

- Using a set of data to answer questions (i.e., how well people can translate an information need into a question that can be asked of the data and how well they can find variables suited to answer the question)
- Finding and using analyzed data to answer questions

5. What is the education level of intended users?

3.4 Research Questions: Phase II

Research questions to address objectives outlined during this phase are as follows:

6. Do stakeholders find the prototype web tool useful?
    - If so, how would they use the functions enabled by the tool?
    - If not, why not?
7. What modifications, if any, should be made to the tool?
8. What additional functions do stakeholders want from this tool?

4.0 Methods

This research was undertaken in two phases using a mixed-methods approach. This first phase used a web-based questionnaire to gather information about participants' characteristics, current practices and needs in obtaining information to support their work in youth tobacco control. Questionnaire results guided the development of a prototype.

The second phase of this research used in-depth, semi-structured, telephone interviews with a subset of participants from the Phase I to obtain feedback about the prototype developed and to identify additional useful functions of the web tool.

Using questionnaires allowed several potential end-users to be involved in the needs assessment and user analysis phase. Further, interviews allowed more in-depth examination of user needs. Combining both methods balanced broad input into development without compromising the richness of information obtained.

4.1 Phase I

This phase of development aimed to solicit input from a large number of potential end users. Questionnaires were well suited for this phase as they are relatively simple, quick, and inexpensive to administer (i.e., compared to interviews). This allows a large number of potential users to influence the development process. Further, making the questionnaire accessible online provided a convenient and efficient medium to collect data.

Despite the benefits of questionnaires, they are limited by the depth of information that can be obtained from potential users because they do not allow researchers to interact with respondents to probe further into issues of particular interest or clarify inconsistent information. Also, questionnaires are subject to interpretation by participants, making them vulnerable to

misinterpretation (i.e., where the participants infer something different from what researchers intended). These limitations were addressed in this study by using in-depth interviews as a complementary method in Phase II.

Questionnaires were used to gather data about: (1) current practices used by stakeholders to support decision-making, (2) stakeholder information needs, and (3) stakeholder characteristics. Data gathered answered questions 2-5 outlined in section 3.2.

4.1.1 Participants

This phase aimed to recruit 60 potential users of the tool in the Western (i.e., British Columbia, Alberta, Saskatchewan, Manitoba), Central (i.e., Ontario), and Eastern (i.e., Nova Scotia, New Brunswick, Newfoundland, Prince Edward Island) regions of Canada. Participants were selected to represent individuals working in research (e.g., scientists conducting research related to youth tobacco control), local health (e.g., individuals responsible for tobacco control in Public Health Units, individuals working with local programs aimed at youth tobacco control), provincial/national health (e.g., provincial/national policy-makers, leaders of provincial divisions of national organizations such as the Canadian Cancer Society), and education sectors (e.g., individuals working in elementary and secondary schools who have used SHAPES that may be interested in youth tobacco control. To minimize costs, the system prototype was developed in English only. Thus, potential users in Quebec were excluded.

The following were guiding criteria used to identify participants: (1) individuals who have used SHAPES—Smoking Behaviours Module; (2) individuals with interest in youth tobacco control identified through personal networks of the thesis committee, the Centre for Behavioral Research and Program Evaluation, and the Population Health Research group; and

(3) individuals identified as potential users through a snowball sampling approach, whereby participants recommend other suitable candidates for inclusion.

Potential participants were contacted via email and provided with the following information: (1) an invitation to participate in the study (Appendix D); (2) an information letter outlining study details and requirements of participants (Appendix E); (3) a link to the web-based questionnaire (http://www.student.cs.uwaterloo.ca/~dlchodos/survey/index.php); (4) a sample SHAPES – Smoking Behaviours Module questionnaire (Appendix A); and (5) a sample of a SHAPES report using fictitious data (Appendix B). The materials served to provide background information for potential participants who may not have been very familiar with the SHAPES initiative. A total of 79 individuals were contacted to participate: 15 researchers, 36 health sector individuals (16 working at the local level and 20 working at the provincial or national level), and 28 educators. Two reminder emails containing the same information as the original request were sent in the course of data collection.

4.1.2 Pilot Testing

A draft questionnaire was developed and pilot tested with individuals with interest in both public health and tobacco control to provide feedback. A purposeful sample (N=6), representing 10% of the target sample size, was selected for pilot-testing. This sample consisted of two participants working in the public health sector, two educators, and two researchers. All pilot-testing participants were from Ontario. Modifications to the questionnaire were made based on reviewer feedback. The final version of the web-based questionnaire can be found in Appendix F.

4.1.3 Data Analysis

Quantitative data were analyzed using descriptive univariate analyses (frequencies and proportions) and cross tabulations of responses from different groups of people (e.g., by role). Results described key characteristics, trends in use of information sources, and information needs of participants by role. All quantitative analyses were conducted using SAS Version 9.1.

4.2 Phase II

Questionnaire results guided the development of a prototype tool. The purpose of this phase was to obtain feedback about the prototype and identify additional useful functions of the web tool. Semi-structured, in-depth telephone interviews were used. The main advantage of conducting interviews is that they provide in-depth information, as they allow the interviewer to probe at areas of interest and reveal information not likely captured through questionnaires. Another advantage of interviews is that they facilitate the development of a relationship between the interviewer and interviewee, such that questions by both parties can be addressed through this process. The major limitation of interviews is that they are time-consuming. This limits the number and scope of interviews that can be conducted, thus placing constraints on the breadth of information obtained. The impact of these limitations was minimized by involving a greater number of potential users in an earlier phase of development.

4.2.1 Participants

Participants who completed the online questionnaire were asked if they would be interested in participating in the next phase of development, which involved a telephone interview. Interviews aimed at gathering feedback about the prototype and to identify additional useful functions to answer questions 6-8 in section 3.2.

Nineteen individuals indicated interest in participating by entering their email address on their questionnaires. Six participants (2 researchers, 2 health sector practitioners, and 2 educators) were selected from this list and contacted to participate in the second stage of development. Where possible, participants were selected to represent potential primary users of the tool from Eastern, Central and Western regions.

Participants were contacted via email and provided with the following information: (1) an invitation to participate in the study (Appendix G); (2) an information letter outlining study details and requirements of participants (Appendix H); (3) a link to the web-based prototype tool (http://www.student.cs.uwaterloo.ca/~dlchodos/prototype/index.html); and (4) a consent form (Appendix I). Participants who responded to this request were contacted to set up a mutually convenient time to conduct the interview. Participants who did not respond to the email request within 7 days were contacted by phone to arrange an interview.

Appendix J contains the interview guide used in this phase. Notes were taken by the researcher while conducting interviews. All interviews were conducted at the University of Waterloo's Population Health Research Group. With written consent, all interviews were tape recorded and transcribed verbatim. The researcher transcribed the audio-tape from the first interview, while the other five audio-tapes were transcribed by "The Conference Publishers", a professional transcription service in Ottawa, ON. Interview participants were contacted approximately 7-10 days after their interview and provided with an opportunity to confirm data collected during the interview. Four participants (researchers and health participants) took advantage of this opportunity. Education participants could not be reached.

4.2.2. Data Analysis

Qualitative data from interview transcripts were organized and analyzed using QSR NVivo 2.0. Where possible, qualitative data were coded as they were collected. Coding data allows researchers to define and categorize data. It provides a new perspective through which to view data being collected and is useful for focusing future data collection efforts. In contrast to quantitative analysis, which fits data into standardized codes, codes are shaped by the researcher's interpretation of the data and may lead the investigation in novel directions (Charmaz, 2000).

First, open coding was applied. Open coding is the process by which data (ex. interview transcripts) are broken down, compared, conceptualized, and categorized. This involved reviewing individual transcripts and selecting data to be coded into emerging categories (i.e., feedback about the **Access Data** function). Axial coding ensued, where the researcher reassembles these data by making connections between categories and sub-categories to identify the main categories. This involved analyzing the coded data within categories to identify emerging themes (i.e., language difficulties). Lastly, selective coding was applied. This process involved selecting core categories, relating them to other categories and authenticating those relationships at an abstract level (Strauss & Corbin, 1990). This involved comparing emerging themes to make sense of the data at a broader level (i.e., under each tool function users valued having multiple data and software format options).

Transcripts were compared with notes taken during the interviews to ensure consistency of data collected. Quotes representing emerging categories were noted. Memos, which elaborate processes, assumptions, and properties that underlie codes, were then created to develop the analysis. Memo writing is used connect categories and explain them within a broader context. It

also helps link analytical interpretation with empirical reality (Charmaz, 2000). Lastly, themes were developed regarding participants' perceptions about the utility of the web tool and its components, as well as their opinions about additional useful functions.

5.0 Questionnaire Results

5. 1 User Characteristics

The first section of the questionnaire focused on identifying important user characteristics to shape the design of the web tool. Questions in this section explored participants' work roles, the region of Canada they work in, their educational background and their self-reported ability to perform a number of tasks potentially associated with the web tool. Results are presented below.

5.1.1 Sample Description

A total of 43 participants completed the web-based questionnaire between March-April 2006. Of these participants 12 were researchers, 18 worked in the health sector, and 13 individuals worked in education. Health sector practitioners included individuals working at the local (e.g., public health units), provincial (e.g., Ontario Lung Association), and national levels (e.g., Health Canada). Most educators were physical education teachers responsible for tobacco-related programming in their schools.

Further, nearly half of participants (N=21) were from Central Canada (Ontario). A total of 15 participants indicated they were from Western Canada (British Columbia, Alberta, Saskatchewan, and Manitoba), while only 7 participants represented Eastern Canada (Newfoundland, Nova Scotia, New Brunswick, and Prince Edward Island). Uneven regional representation limited the utility of analyzing results by region. Therefore, results are presented on the basis of all participants and by sector (research, health, education). Table 1 illustrates the distribution of participants according to region and role.

Table 1: Participant Distribution by Role and Region (N=43)

Sector	Region			
	Western	**Central**	**Eastern**	**Totals**
Research	4	4	4	**12**
Health	9	7	2	**18**
Education	2	10	1	**13**
Totals	**14**	**21**	**7**	**43**

5.1.2 Education

All participants

Participants were asked to identify the highest level of formal education they have received. The majority of individuals (N=20) indicated their highest level of education was a Bachelor's degree; however, 23% of participants reported having attained a Doctoral degree.

Research

Examining education by role reveals that all 10 individuals who reported attaining a Doctoral degree were researchers. The other two researchers who participated indicated having received a Master's degree and Bachelor's degree.

Health

Three individuals working in the health sector reported having received a College diploma as the highest level of education attained. Further, 10 participants reported having a Bachelor's degree, while 5 received a Master's degree.

Education

Most participants from the education sector reported having Bachelor's degrees (N=10), while a small number (N=3) reported having obtained a Master's degree.

5.1.3 Self-reported Ability Ratings

Participants were asked to rate their ability to perform a variety of tasks related to the web tool under development. Ratings were used to tailor development of the web tool to ensure its consistency with users' skills. Tasks of interest included: (1) finding information on the internet; (2) performing common computer tasks (e.g., word, processing, email); (3) conducting data analyses using spreadsheets (e.g., Microsoft Excel); (4) conducting data analyses using statistical software (e.g., SAS, SPSS); (5) using computer mapping tools; (6) using a set of data to answer questions; and (7) finding analyzed data (e.g., in reports) to answer questions. Rating options were: excellent, very good, good, and poor.

All participants

Self-reported ability ratings for all participants are presented in Table 2. Participants were quite confident in their abilities to perform tasks 1 and 2. Tasks 3 and 4 were rated much more conservatively. In fact, most participants felt their ability to perform task 4 was poor. Generally, participants felt comfortable performing tasks 5, 6 and 7.

Table 2: Participants Self-reported Ability Ratings

Task	Excellent % (n)	Very Good % (n)	Good % (n)	Poor % (n)
1	53.5 (23)	34.9 (15)	11.6 (5)	0 (0)
2	60.5 (26)	27.9 (12)	11.6 (5)	0 (0)
3	9.3 (4)	25.6 (11)	37.2 (16)	27.9 (12)
4	11.6 (5)	11.6 (5)	20.9 (9)	55.8 (24)
5	20.9 (9)	25.6 (11)	32.6 (14)	20.9 (9)
6	23.3 (10)	37.2 (16)	34.9 (15)	4.7 (2)
7	34.9 (15)	23.3 (10)	34.9 (15)	7.0 (3)

Task 1: Finding information on the internet
Task 2: Performing common computer tasks (e.g., word, processing, email)
Task 3: Conducting data analyses using spreadsheets (e.g., Microsoft Excel)
Task 4: Conducting data analyses using statistical software (e.g., SAS, SPSS)
Task 5: Using computer mapping tools
Task 6: Using a set of data to answer questions
Task 7: Finding analyzed data (e.g., in reports) to answer questions

Research

Overall, researchers rated their abilities to perform the tasks listed very highly. In particular, most researchers rated their ability to perform common computer tasks (Tasks 1 & 2) and to access and use data (Tasks 6 & 7) as "excellent" (75%, 83%, 58%, and 83% respectively). Tasks 3, 4, and 5 generated mixed ratings among researchers. Nevertheless, 75%, 75%, and 67% of research participants rated their abilities as at least "good" on these tasks respectively.

Health

Health sector practitioners were more conservative when rating their abilities to perform the list of tasks. Eighty-nine percent of participants in this sector rated their ability to perform tasks 1 and 2 as at least "very good". Results for the remaining tasks were less favorable. Only 22% of participants felt they were at least "very good" at conducting data analyses using spreadsheets, while 39% felt this way about using computer mapping tools. In addition, 78% of participants working in health rated their ability to conduct analyses using statistical software as "poor". Lastly, health sector practitioners felt confident in their abilities to work with data: 94% and 89% reported being at least "good" at using a set of data to answer questions and finding analyzed data to answer questions respectively.

Education

Participants from the education sector were also quite conservative in rating their abilities to perform the tasks listed above. While most educators felt they were at least "very good" at performing tasks 1, 2, and 5 (85%, 77%, 54%), fewer rated their abilities with respect to tasks 3, 6, and 7 (46%, 46%, 38%) in the same fashion. Further, 54% of participants from the education sector felt their ability to conduct data analyses using statistical software was "poor".

5.2 Current Practices

This section of the survey focused on identifying participants' current practices in finding and using information to support their work. Areas covered included (1) sources of information used and frequency of their use; (2) perceived quality of information sources; (3) goals in seeking out information, (4) time spent working with data; and (5) data analysis tool used. Questionnaire results from this section are presented below.

5.2.1 Information Sources Used

Participants were asked to report how frequently they used the following resources of information to support their work: (1) media (newspapers, magazines, newsletters); (2) local government groups (e.g., local public health department); (3) provincial or national government groups; (4) non-governmental, voluntary organizations (e.g., Heart & Stroke Foundation, Canadian Cancer Society); (5) lay sources (e.g., colleagues, unaffiliated websites, unpublished/"grey" literature; and (6) scientific literature (e.g., journals). Response options included the following: daily, weekly, monthly, and rarely/never.

All participants

While all information sources were used quite frequently, the most frequently used source of information was media, with 42% of participants reporting they use this source daily. By contrast, results across all participants revealed that 23% of respondents used scientific literature rarely or never. Figure 1 depicts the frequency with which participants reported using the information sources listed.

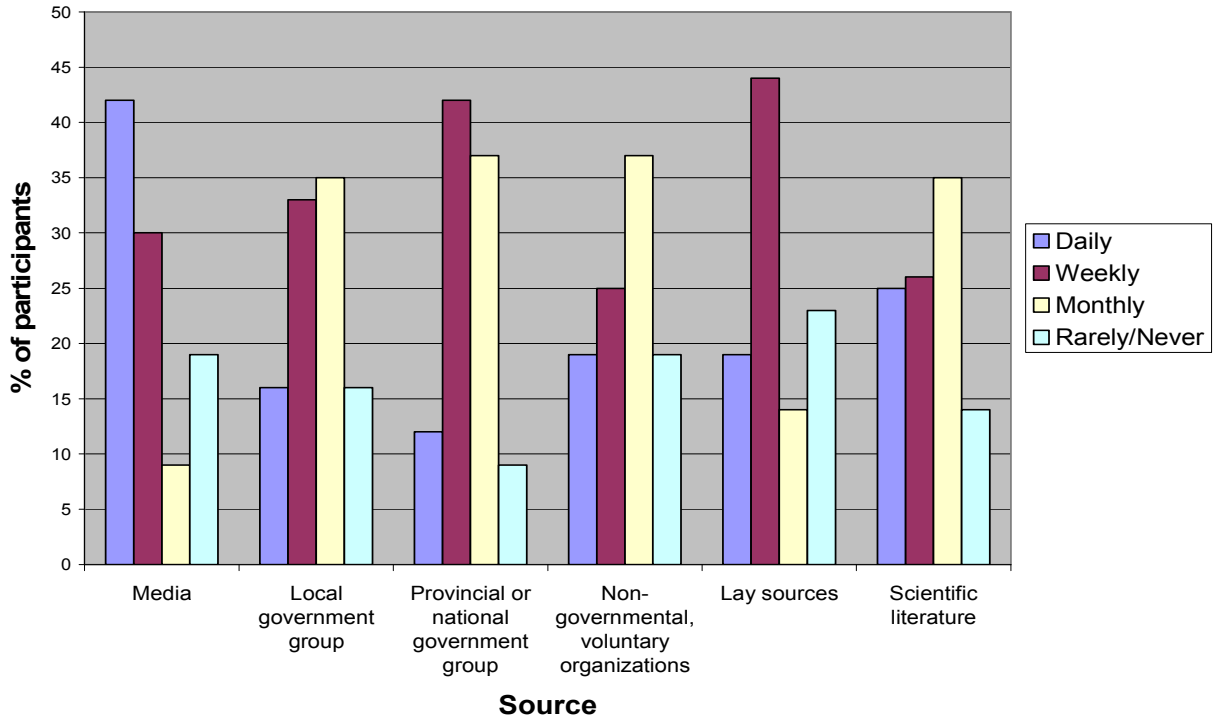


Figure 1: Information Sources Used by Participants

Research

To simplify analysis of results, "daily and weekly" and "monthly and rarely/never" responses were collapsed into two categories to create a dichotomous variable. Limited "rarely/never" responses provided the rationale for collapsing categories to reflect regular use (at least weekly) compared to less regular use (monthly or rarely/never). Results showed that while 50% of researchers reported using media at least weekly, 33% reported using provincial or national government groups and non-governmental, voluntary organizations as information sources regularly. Eighty-three percent of researchers reported using scientific literature at least weekly to support their work. Finally, only 8% of research participants reported using local government groups at least weekly.

Health

At least half of health sector practitioners used the information sources listed at least weekly. In particular, 83% of participants reported using media and provincial and national government groups at least weekly. Local government groups and lay sources were frequented at least weekly by 78% and 72% of health respondents respectively. Finally, 50% of participants reported using non-governmental, voluntary organizations as an information source at least weekly.

Education

The majority of educators reported using media (77%) and lay sources (62%) at least weekly. Local, provincial, or national government groups were used at least weekly by 46% and 31% of educators respectively. Only 23% of education participants reported using scientific literature at least weekly.

5.2.2 Quality of Information Sources

Participants were asked to rate the quality of the above mentioned resources. Three quality indicators were investigated: reliability, relevance, and currency. Response options were excellent, good and poor.

All participants

Overall, participants rated the quality of information sources favorably. The most reliable sources of information identified by participants, ascertained by the highest proportion of "excellent" ratings, were as follows: scientific literature (72%), provincial or national government groups (58%), and non-governmental, voluntary organizations (44%). Further, 37% of participants felt that information obtained from lay sources, including colleagues,

unaffiliated websites, and unpublished literature, had poor reliability. Reliability of media information was also rated unfavorably, as 44% of participants rated this source as "poor".

Relevancy ratings for the information sources listed were generally positive. Provincial or national government groups and non-governmental, voluntary organizations received the highest percentage of "excellent" relevancy ratings, with 49% and 46.5% respectively.

The majority of sources received mostly "good" ratings with respect to currency of information, with proportions ranging from 46-58%. Moreover, 37% of respondents rated the currency of information from non-governmental, voluntary organizations as "excellent".

Research

Researchers rated the reliability of scientific literature (83%) and provincial or national government groups (42%) as "excellent". Media received the largest "poor" reliability ratings, with 83% of researchers selecting this option. Lay sources of information were also rated as having "poor" reliability by 67% of researchers.

Researchers rated relevancy primarily as "good" and "excellent" for all sources of information. Sixty-seven percent of researchers felt that scientific literature and non-governmental, voluntary organizations provided information very relevant to their work (rated "excellent"). Relevance of information from provincial and national government groups was also rated as "excellent" by 50% of researchers.

Most researchers reported that the sources of information listed were current ("good" and "excellent" ratings). Specifically, 42% of researchers rated media and non-governmental, voluntary organizations as "excellent" with respect to finding current information.

Health

The majority of participants from the health sector rated all sources of information as either "good" or "excellent" with regards to reliability. While 83% of researchers rated media as having "poor" reliability, only 33% of health sector practitioners agreed. Information from scientific literature and provincial or national government groups received the highest percentage of "excellent" reliability ratings, both with 78%.

Sixty-one percent of health sector practitioners rated provincial or national government groups as "excellent" with regards to relevance. Further, 44% rated the relevance of information provided by non-governmental, voluntary organizations as "excellent". This was expected given that many participants in this group work for such groups and organizations.

The majority of health sector practitioners reported that sources of information listed were current. A particularly current source identified by this group of participants was non-governmental, voluntary organizations; 39% of participants rated this source as "excellent".

Education

Reliability of all sources of information was rated by most educators as "good" or "excellent". Despite the general trend towards positive ratings, 23% of educators felt the reliability of media information was "poor". Further, information from local government groups was very relevant to educators, as 53% of respondents rated this source as "excellent". All other sources were rated by the majority of educators as "good", with percentages ranging from 53 to 77%. Educators felt that all sources of information were current, as evidenced by a majority of "good" ratings reported. In addition, media, local government groups, provincial or national government group, lay sources were rated as "excellent" with regards to currency by 38%, 46%, 38%, and 31% of respondents respectively.

5.2.3 Goals in Seeking Information

To further examine participants' current practices for finding and using information to support their work, they were asked: "What are your goals in seeking out information?" Participants were asked to check applicable goals from a list, and then asked to rank goals they checked according to their priorities. The list of goals provided included the following: (1) evaluating programs or interventions to determine effectiveness; (2) evaluating programs or interventions to make funding decisions; (3) finding information to identify priorities for new programs; (4) conducting academic research; (5) reporting to management or government; (6) finding information to create materials for programs (e.g., informational pamphlets or brochures); (7) addressing parental concerns; (8) responding to media queries; (9) getting information for personal interest/curiosity. Participants were also provided with an "other" option where they could enter text (no length limits). To facilitate analysis, results are presented based on a dichotomous variable indicating whether or not participants selected a goal. Results of the ranking analyses are subsequently presented.

All participants

Results revealed four main goals of participants in seeking out information: evaluating programs or interventions to determine effectiveness (84%); finding information to identify priorities for new programs (74%); finding information to create materials for programs (67%); and reporting to management or government (60%). Moreover, conducting academic research and addressing parental concerns were the least applicable goals, with only 39% and 31% of participants seeking out information for these reasons. Three participants entered the following goals under the "other" option: "monitor population health status with the goal of informing, enhancing and evaluating evidence-based health programs and campaigns",

"translating/compiling information to support the activities of external stakeholders", and "curriculum support".

Research

Analysis of goals in seeking information by role reveals general trends in the most applicable goals across roles. While an overlap in top goals identified exists, there are differences in goals between sectors. Ninety-two percent of research participants indicated that they seek out information to conduct academic research. In addition, evaluating programs or interventions to determine effectiveness and finding information to identify priorities for new programs were goals checked off by 83% and 67% of researchers respectively.

By contrast, few researchers sought out information to address parental concerns (8%) and to respond to media queries (17%). No participants in this sector indicated that evaluating programs or interventions to make funding decisions was an applicable goal for seeking information.

Results from ranking analyses demonstrated that 75% of researchers ranked conducting academic research as their highest priority goal in seeking information, while 33% felt that evaluating programs or interventions to determine effectiveness was their second highest priority.

Health

The majority of health sector practitioners also indicated they sought out information to evaluate programs or interventions to determine effectiveness (89%) and to find information to identify priorities for new programs (83%). In addition, 94% of health sector practitioners reported seeking out information to report to management or government. Only 16% of participants in this sector sought out information to conduct academic research. Two participants

reported seeking out information to "monitor population health status with the goal of informing, enhancing and evaluating evidence-based health programs and campaigns" and "translate/compile information to support the activities of external stakeholders". Analyses of goal rankings revealed that 39% of health sector practitioners sought out information to evaluate programs or interventions to determine effectiveness as their highest priority.

Education

Educators, like the other two groups, were also seeking out information to evaluate programs or interventions to determine effectiveness (76%) and to find information to identify priorities for new programs (69%). A main goal in seeking information for 92% of educators was to find information to create materials for programs. Further, one participant cited "curriculum support" as a goal for seeking information under the "other" option provided.

Ranking analyses indicated that 38% of educators ranked evaluating programs or interventions to determine effectiveness as their top priority. In addition, 23% of participants from the education sector ranked finding information to identify priorities for new programs as their top priority in seeking information.

5.2.4 Data Analysis Activities

The last area investigated under the current practices section was data analyses activities. Specifically, how much time participants spend working with data and the data analysis tools they use most frequently were examined. Participants were asked: "On average, how many hours per week do you spend finding, using, and /or analyzing data?" and "What data analysis tools do you currently use?" Response options for each question were as follows: (1) None, <1, 1-5, 6-10, >10; and (2) SAS, Stata, Epi Info, SPSS, Spreadsheet program (e.g., Microsoft Excel),

Database program (e.g., Microsoft Access), and an "other" option where participants could enter free text responses. In addition, participants were asked to rank the tools they identified according to how frequently they use them. Results are presented below.

All participants

Figure 2 demonstrates the distribution of participants according to how much time they spend finding, using, and/or analyzing data. As Figure 2 shows, the majority of participants (51%) reported working with data, on average, for 1-5 hours per week. An additional 21% of participants responded that they work with data for an average of 6-10 hours per week. Further, only 1 participant indicated that they don't spend any time working with data ("none" response).

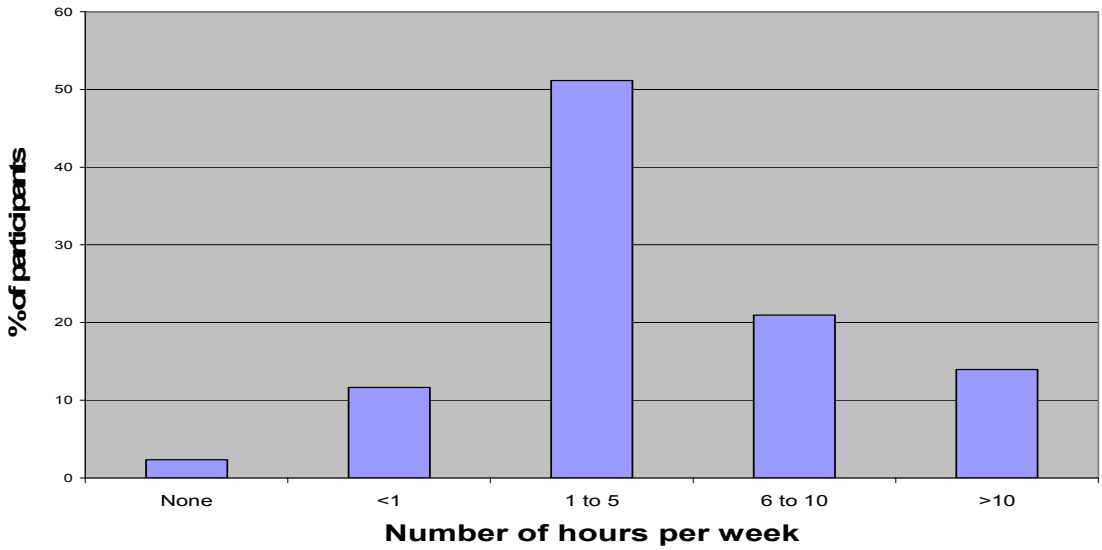


Figure 2: Participants' Average Time Working With Data Per Week

To facilitate analysis of tools used by participants, rankings were collapsed to examine whether or not participants reported using the tool at all. Results indicate that 69% of participants use spreadsheet programs. Further, 24% of participants also reported that they use SPSS to analyze data. The tool that was least used by participants was Stata, with only 2 participants (5%) reporting they use this tool. Six participants reported using "other" tools for analysis. The tools reported were: NVivo, GIS, MIWIN, BI Query/Analyse, Trevlac (school specific database/tool), and Markbook. Figure 3 depicts the percentage of participants who indicated they used the tools listed according to role. Results are discussed below.

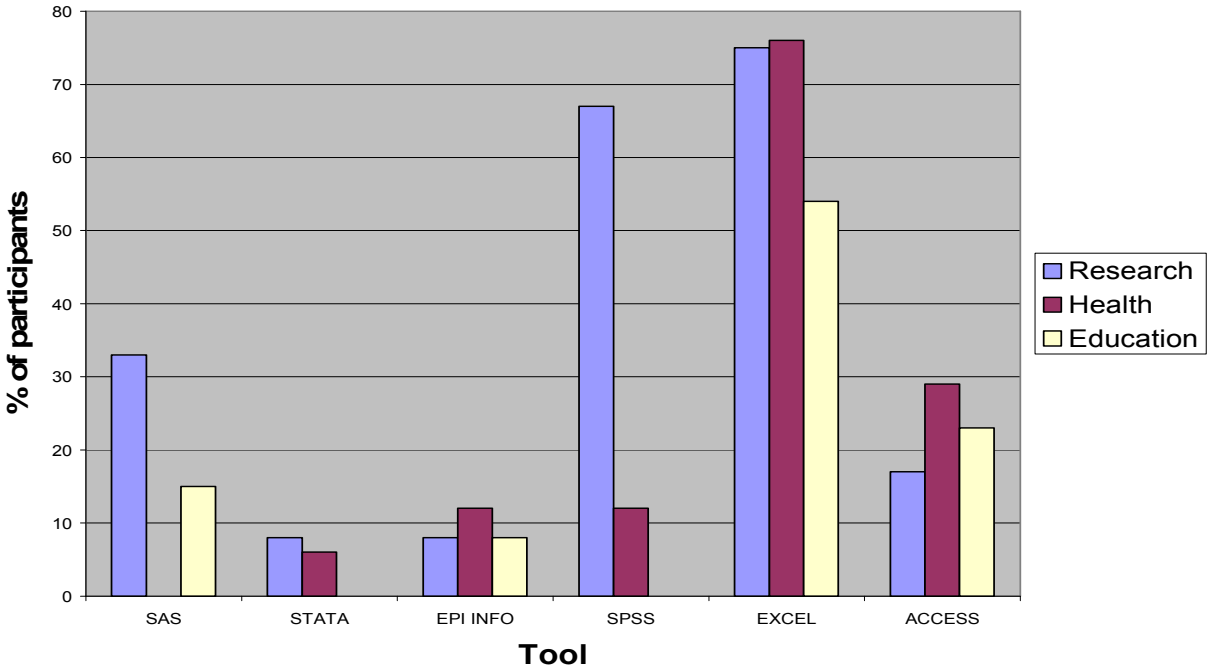


Figure 3: Data Analysis Tools Used by Participant's Role

Research

Survey results indicate that researchers spent the most time finding, using, and analyzing data compared to health and education sector participants. Forty-two percent of researchers reported spending 1-5 hours working with data, while 25% and 33% reported spending 6-10 hours and more than 10 hours working with data per week respectively.

Spreadsheet programs were the most commonly used tool among all groups, with 75% of researchers reporting using them. Sixty-seven percent and thirty-three percent of researchers also reported using SPSS and SAS respectively to analyze data.

Analysis of participants' rankings of tools revealed that 42% of researchers ranked SPSS as the tool they use most frequently. After SPSS, 33% of researchers ranked spreadsheet programs as the second most frequently used data analysis tool. Seventy-five percent of researchers reported using more than one tool.

Health

Fifty-six percent of health sector practitioners indicated that they spend, on average, between 1-5 hours working with data per week. One participant from the health sector indicated they do not spend any time working with data, while another reported spending less than 1 hour per week working with data.

Among the data analysis tools listed, spreadsheet and database programs were most commonly used by health sector practitioners, as 76% and 29% of participants reported using these tools. Further, no one from the health sector reported using SAS to analyze data.

Health sector practitioners ranked spreadsheet programs as the tool they use most frequently (59%), while database programs were ranked by 18% of participants as the second most frequently used tool. In addition, 47% of respondents reported using more than one tool.

Education

Education participants spent less time working with data compared to researchers and health sector practitioners. In fact, 31% of participants reported spending less than one hour finding, analyzing, and/or using data. Similarly to health sector practitioners, spreadsheet programs were the tool most educators reported using. However, only 54% of education sector participants reported using such a tool (compared to 76% of health participants). Lastly, 31% of educators indicated that spreadsheet programs, such as Microsoft Excel, are the tools they use most frequently. Only 38% of educators reported using more than one tool.

5.3 Information Needs

This section of the survey focused on identifying information needs of participants. In particular, participants were asked: (1) what types of information or data would be useful to support their work; (2) how they would like to use information or data; and (3) how they would like to analyze data made available. Web tool functions will aim to fulfill participants' needs identified in this section, while considering key user characteristics identified earlier. Below are the results from this section of the questionnaire.

5.3.1 Useful types of Information or Data

To investigate information or data that would be useful to participants, they were asked: "What types of information or data would you find useful to support your work with respect to youth tobacco control?" Participants were provided with a list of potential types of information or data, which included the following: (1) anecdotal data (e.g., stories of effective interventions shared by schools or communities); (2) local smoking data (e.g., smoking rates of local schools); (3) provincial smoking data (e.g., by province, how are students accessing tobacco products); (4)

national smoking data (e.g., schools/areas that are national leaders with respect to smoking rates); (5) results of program evaluations; (6) reports of smoking profiles of schools or communities; and (7) intervention information from health professionals. Response options were very useful, somewhat useful, and not useful. An "other" option allowed participants to enter any response.

All participants

All types of information or data listed were rated as "very useful" by the majority of participants. Ratings ranged from 51-81%. Specifically, 81% of participants reported that provincial smoking data and reports of smoking profiles of schools or communities would be "very useful" to support their work. Ratings of "not useful" were uncommon. Anecdotal data received the highest percentage of "not useful" ratings, with 14% of participants responding this way. Figure 4 demonstrates the percentages of "very useful" ratings for all information and data types listed, according to participants' role.

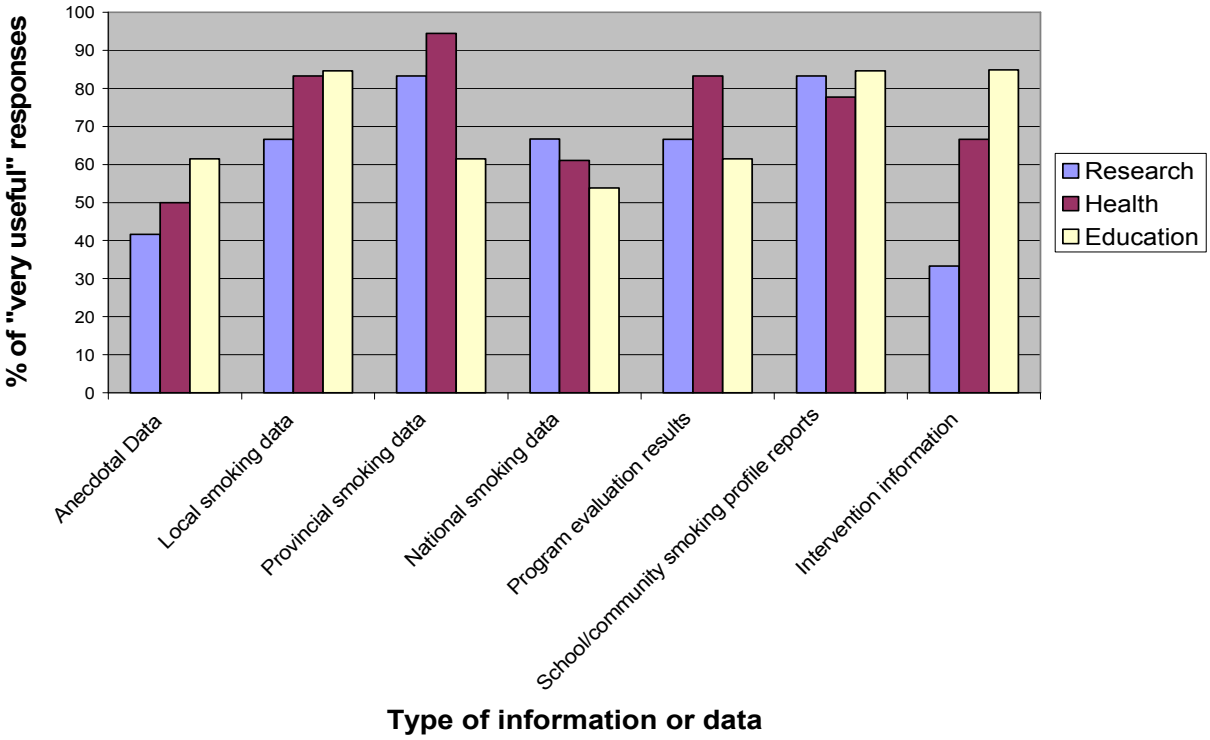


Figure 4: "Very Useful" Types of Information or Data by Participant's Role

Research

With the exception of anecdotal data and intervention information from health professionals, all types of information and data listed were rated by more than half of researchers as "very useful" (range 67-83%). The highest percentages of "very useful" ratings were for provincial smoking data and reports of smoking profiles of schools or communities, each with 83%. The only "not useful" ratings reported were for anecdotal data and results from program evaluations. In both situations, only one researcher indicated that these types of information would not be useful.

Health

Most health sector practitioners also reported that the types of information and data listed would be "very useful" to them. Moreover, 94% of participants working in health indicated that provincial smoking data would be "very useful". Local smoking data and results of program evaluations were reported as "very useful" by 83% of health sector practitioners. Lastly, 17% of participants in this sector felt that anecdotal data would not be useful to support their work.

Education

Education sector participants also reported high percentages of "very useful" responses for all types of information or data listed. Three particular types of information were rated as "very useful" by 85% of educators: local smoking data, reports of smoking profiles of schools or communities, and intervention information from health professionals.

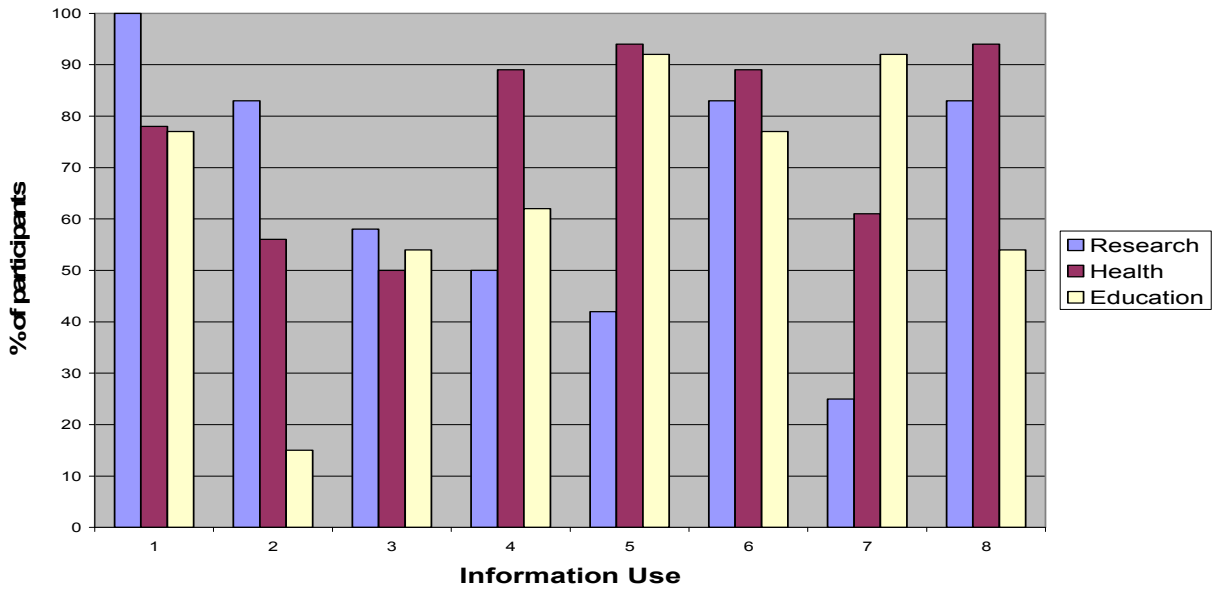
5.3.2 Information or Data Uses

Participants were asked: "How would you like to be able to use the information or data made available?" Once again, a list of possible options was provided for participants and they were asked to indicate which use listed applied to them. They were also asked to rate all uses that applied according to their priorities. Potential uses of information or data provided were as follows: (1) access material for presentations or speeches; (2) perform secondary data analyses; (3) match schools based on smoking profile characteristics; (4) identify potential targets for interventions (e.g., schools with high smoking rates); (5) identify and share effective interventions; (6) track progress of schools, regions, or provinces over time; (7) create materials to engage students in school projects or assignments; and (8) identify and share effective interventions. Results are presented based on whether or not the information use applied to the

respondent. Ranking analyses will also report information uses ranked as top priorities for each sector.

All participants

Information or data uses listed applied to the majority of participants. Overall, 84% of participants indicated they would like to be able to access material for presentations or speeches and track the progress of school, regions, or provinces over time. Also, 79% of participants were interested in identifying and sharing effective interventions and comparing smoking data across jurisdictions or demographic profiles. Figure 5 shows the percentage of participants, by role, who indicated that information or data uses listed were applicable to them.



1 Access material for presentations or speeches
2 Perform secondary data analyses
3 Match schools based on smoking profile characteristics
4 Identify potential targets for interventions (e.g., schools with high smoking rates)
5 Identify and share effective interventions
6 Track the progress of schools, regions, or provinces over time
7 Create materials to engage students in school projects or assignments
8 Identify and share effective interventions

Figure 5: Applicable Information or Data Uses by Participant's Role

Research

All researchers were interested in accessing material for presentations or speeches. In addition, 83% of researchers indicated they would like to be able to perform secondary data analyses, track the progress of schools, regions or provinces over time, and compare smoking data across jurisdictions. By contrast, only 25% of researchers were interested in creating materials to engage students in projects or assignments.

Fifty-eight percent of researchers ranked performing secondary analyses as their highest priority. Another 25% of researchers rated accessing materials for presentations or speeches as their first priority. Lastly, 33% of researchers ranked tracking progress of schools, regions, or provinces over time as their second highest priority.

Health

Health sector practitioners consistently indicated that the information or data uses listed were applicable to them. Ninety-four percent of participants in health demonstrated interest in identifying and sharing effective interventions and comparing smoking data across jurisdictions or demographic profiles. In addition, 89% of health sector practitioners indicated that they would like to identify potential targets for interventions and track the progress of schools, regions, or provinces over time.

Further, 50% of participants working in health indicated that being able to identify potential targets for interventions was their highest priority. Using information to identify and share effective interventions was ranked as the top priority for 33% of health sector practitioners. Finally, 28% of participants in this sector ranked the ability to identify potential targets for interventions as their second highest priority in using information or data.

Education

Participants working in education settings were very interested in the majority of uses listed, with the exception of performing secondary data analyses (only 15% of educators were interested in using data this way). Ninety-two percent of educators were especially interested identifying and sharing effective interventions and creating materials to engage students in school projects or assignments. In addition, 77% of educators indicated they would like to use information or data made available to access material for presentations or speeches and to track the progress of schools, regions, or provinces over time.

Results of the ranking analyses indicated that 54% and 38% of educators ranked identifying and sharing effective interventions and creating materials to engage students in school projects or assignments as their highest priorities respectively. In addition, 38% of education participants ranked tracking progress of schools, regions, or provinces over time as their next highest priority.

5.4 Follow-up Interview

At the completion of the survey, participants were asked if they would like to be contacted to conduct a follow-up interview. Participants were told that the interview was expected to last 30-60 minutes. Table 3 presents the distribution of participants by role and region that indicated interest in participating in interviews.

Table 3: Interest in Follow-up Interview by Region

	Region			
Sector	**Western (N)**	**Central (N)**	**Eastern (N)**	**Totals (N)**
Research	2	2	0	**4**
Health	5	6	1	**12**
Education	0	1	3	**4**
Totals	**7**	**9**	**4**	**20**

In summary, questionnaire results show that most participants reported being comfortable with many tasks potentially enabled by a SHAPES web tool. Investigation into participants' current practices for obtaining information to support their work revealed differences according to participant's roles. One distinct finding was the different ratings for use and reliability of media sources of information between educators and all other participants. Finally, significant overlap across all sectors was found with regards to participants' information needs and goals in seeking information.

6.0 Interview Results

6.1 Sample Description

Six participants from Phase I participated in Phase II interviews: two researchers, two individuals working in health, and two educators. Researchers interviewed were from Western and Eastern Canada. One participant worked as a Research Scientist for a provincial organization while the other researcher was a faculty member at a University. Health sector participants included one individual working as a Regional Tobacco Coordinator at a local Public Health Unit and one individual working as an anti-tobacco advocate at a provincial/national organization. Further, education participants interviewed included the Head Student Services and a Physical Education teacher at two high schools. Table 4 illustrates the breakdown of interview participants by region and sector.

Table 4: Interview Participants by Region and Sector

	Region			
Sector	**Western (N)**	**Central (N)**	**Eastern (N)**	**Totals (N)**
Research	1	0	1	**2**
Health	1	0	1	**2**
Education	0	2	0	**2**
Totals	2	2	2	**6**

6.2 General Feedback

Overall, interview results indicated strong interest in the prototype web tool. All participants commented favorably on the utility of the tool. A participant from the health sector felt that the tool "will be very valuable" (Transcript 6, pg. 2). Research participants made the

following comments about the prototype: "I think this would be a fabulous tool" (Transcript 3, pg. 9) and "I think it's going to be extremely useful and very used. I can see it having a lot of applications" (Transcript 4, pg. 16). Educators echoed the positive feedback, with one participant indicating they "would definitely use it" (Transcript 2, pg. 17).

6.3 Access Data

The **Access Data** function allows participants to extract data of interest according to individual variables or by selecting categories of variables. Participants can select a data source (e.g., 2004-05 Youth Smoking Survey), variables of interest contained in that data source (e.g., smoking status), and geographical area for which to extract data (e.g., province of Ontario). Participants can extract data in a variety of data and software formats, including CSV, Microsoft Excel, SPSS, and SAS.

During the interviews, participants were asked whether this function was useful to them, and if so, how they would use the data extracted. If participants did not feel that this was a useful function, reasons for this were explored. Participants were also asked what modifications, if any, they would make to this section of the tool. Responses, according to participant roles, are presented below.

All Participants

Most participants (67%) reported that the ability to extract data was useful to them and cited a variety of uses for the data they extracted. A few modifications were suggested for this function, as presented below.

Research

Both researchers interviewed demonstrated strong interest in using this function by making the following comments: “Oh yes, I would use this” (Transcript 3, pg. 3) and “Oh, I think yes, definitely” (Transcript 4, pg. 3). Further, researchers indicated they would use the data they extracted to support a variety of work-related functions, including: (1) identifying important questions that can be answered using data available; (2) writing grant proposals; (3) preparing presentations; (4) writing reports or papers; and (5) supporting graduate students through learning exercises.

Researchers also commented on the data and software formats available for extraction. One researcher expressed concern that users, particularly in public health and education, might be intimidated by inclusion of more complex software formats such as SPSS and SAS. This participant suggested providing an explanation of what the format is (e.g., SPSS – statistical software) would address this issue. Another researcher interviewed felt that format options were “really good” (Transcript 4, pg. 4) because they allow for flexibility and increase the likelihood that the tool will appeal to more users.

Aside from format descriptions, researchers did not suggest further modifications for this section of the tool. However, one researcher noted that it was difficult for them to suggest modifications given that the prototype is not functional, but simply provides a demonstration of potential functions.

Health

Both health sector practitioners also made the following enthusiastic comments when asked if the **Access Data** function was useful to support their work: “Wow, isn’t this marvelous”, “Oh, definitely!” (Transcript 1, pg. 3) and “I absolutely see it being valuable and useful”

(Transcript 6, pg. 6). Participants working in the health sector reported they would use extracted data in the following ways: (1) to identify areas to concentrate resources; (2) to identify successful strategies or programs; (3) to compare smoking profiles of geographical regions. One participant commented on the value of having data sources from multiple years, thus allowing comparisons to be drawn, between and within regions, over time.

Further, one participant also expressed concern with regards to data and software format options. They said: "I think most of us in the field would be very unfamiliar with these [SPSS, SAS, CSV]" (Transcript 1, pg. 5). They recommended having a description of the format and a 'most likely to choose' or default option as a helpful modification.

Education

Initially, education participants indicated that this function would be useful to them. However, upon further probing and discussing how they would use data extracted, it became evident that participants were not interested in extracting and working with raw data, but rather in obtaining summary information from the data. For example, one participant made the following comment: "Spreadsheet stuff is something I'm not very good at. I would have to look at things and notice it, but taking that data and copying it into my own spreadsheet and doing stuff with it, I'm really limited that way" (Transcript 5, pg. 5).

Similarly, another educator commented "people really aren't interested in the numbers, they're interested in what they mean" (Transcript 2, pg. 5). This participant further commented that "a user friendly explanation of what the data are or a user friendly explanation of the summary of the data" (Transcript 2, pg. 4) would be helpful.

6.4 Create Reports

The **Create Reports** function allows users to create their own smoking profile reports using available data sources (e.g., 2004-05 Youth Smoking Survey). Reports can be created by selecting a geographic region (e.g., Region of Waterloo) and results are generated by grouping data from all data points (e.g., schools) within the specified region. Users can also tailor the content of the report according to their needs by selecting content of interest from a list provided. This function also supports creating reports in a variety of software formats, including PDF, Microsoft Word, and Microsoft PowerPoint.

Feedback on this section of the tool focused on asking participants whether this function was useful to them, and if so, how they would use the reports generated. Participants were also asked what modifications, if any, they would make to this section of the tool. Responses, according to participant roles, are presented below.

All Participants

All participants indicated that the ability to create reports was useful to them. Again, respondents cited a number of different ways to use reports created to support their work, with some uses being reported by multiple participants. Two main areas for modification were identified. These results, by participants' role, are presented below.

Research

Both researchers interviewed indicated a strong interest in using this function. They indicated they would use reports generated mainly to conduct research, consultations, and presentations at the community level, particularly within schools. One researcher commented:

> *I would use these reports when I'm in any kind of community work because communities are immediately interested in something that is relevant to them. They are interested in what's happening in other places, but they want to know what does their own neighborhood look like, what's happening in our own backyard and to be able to pull that kind of information out especially when you can talk at the health region level, school district level, and school level. I think that's a very, very useful tool (Transcript 3, pg. 5).*

Participants also commented on the software format options for generating reports. Both researchers felt that having a wide range of options was appropriate given the range of users the tool targets. In particular, Microsoft PowerPoint was seen as very useful by one researcher: "The PowerPoint, that's very useful because if, as I said, someone wanted a presentation and needed you to discuss it with them, it would be easy to generate it this way, so yeah that is quite useful" (Transcript 4, pg. 8)

Health

Health sector practitioners interviewed also reported that the ability to create summary reports of data collected through SHAPES was useful. Moreover, participants indicated interest in using reports to support the following activities: (1) respond to telephone queries (e.g., from a public health nurse who wants to convince his or her school to take action on smoking issues); (2) to track the progress of schools and regions over time; (3) to identify areas to focus resources; (4) to advocate and help schools, regions, etc, move forward with tobacco control agendas. In addition, one participant reported they liked the idea of having the total number of students whose data are included in the reports available.

An important area for modification identified was the language used to identify geographical regions (i.e., localization). The prototype was created using language common in Ontario (e.g., district school board), and one health participant commented on potential implications:

The only thing I see…everyone has different kinds of language. For instance, in our province we're broken down by regional health authority, which is quite different than a public health unit. We don't have school boards either, they're called district education councils. I think we all have different languages but as long as there is an understanding of what things are (Transcript 6, pg. 9).

Health sector practitioners provided feedback about the utility of the software format options for creating reports. While participants found all formats useful, Microsoft PowerPoint stood out among the rest. One participant reported: "PowerPoint (PPT) is great too because then you can put those beautiful charts and graphs, and I'm not really all that techy with that but if it's all done for you and you can put it directly into a PPT, that would be great" (Transcript 1, pg. 7)

Education

Educators interviewed also reported that this function was useful to support their work: "Yes, I like pictures, so histograms, bar charts, pie charts, because that's how you get your message to people about what is going on" (Transcript 2, pg. 3) and "Yeah, I think so. That tells you a lot about overall health curriculum and stuff, where you need to introduce stuff like that" (Transcript 5, pg. 6).

One educator reported they would use reports generated in the following way:

To be able to say, this is what happened last year, this is what happened this year at our school, so did the number of smokers go up, did they go down? Are there more boys, are there more girls? This is how kids say that they stopped smoking; this is how kids say that they start smoking (Transcript 5, pg 6).

The other educator interviewed, indicated intentions to use the reports in a similar fashion:

I think that the pictures of the data would be useful to tell parents about what goes on because that's what we do. When we describe to them…we have a picture of that, a histogram or pie chart or what have you, again it gives the parents a birds eye view of what it is we're talking about" (Transcript 2, pg. 6).

The only potential modification suggested by an educator was with respect to the style of the report. This participant indicated a need to have bright, eye catching graphics on the reports to attract the attention of students. This educator cited the drastic change in textbook graphics over the past few decades and the positive student response as evidence to support the inclusion of pictures into the reports.

In addition, educators reported that Microsoft Word and PowerPoint were the software formats they were most familiar with and used most frequently. One educator said: "I like Word as well because then I can cut and paste things and I could put test questions or quiz questions using some of the data or information. I could paste a graph from a report onto a test and ask students to describe what is going on" (Transcript 5, pg. 7).

6.5 Ask a Question of the Data

The **Ask a Question of the Data** function allows users to build their own question to ask of the data by selecting any combination of variables and the corresponding response options of interest. To build a query, users first select the province and scope to which their query applies. Next, variables of interest to them (e.g., Grade) are selected. Each time a variable is chosen, response options for that variable are automatically updated (e.g., Grade 5, Grade 6, Grade 7, Grade 8, and Grade 9) for the user to select. An example of a question that can be answered using this function is as follows: How many Ontario students in Grade 9 report they smoke and have a brother who also smokes? Finally, users may choose to display query results in a chart or a map.

Feedback on this section of the tool focused on asking participants whether this function was useful to them, and if so, how they would use it to support their work. Feedback on the utility of different formats (i.e., chart and map) was also obtained. Finally, participants were

asked what modifications, if any, they would make to this section of the tool. Responses, according to participant roles, are presented below.

All Participants

Again, all participants indicated that this was a useful function and reported a number of ways they would use it. However, respondents identified two areas for modifications: the name of the function (N=2) and the language used (N=3). Specific results according to participant's roles are presented below.

Research

Both researchers interviewed indicated they would use this function. When asked how they would use this function, one researcher replied:

> *"I'd probably use it as a platform to something else. As a proposal, say I was looking at the [prevalence] of passive smoke in the home for young children. For that kind of thing I'd want to present my case by how many homes, how many mothers smoked and that kind of stuff." (Transcript 3, pg. 7)*

Further, they also reported using this function in the following manner:

> *People phone up all the time, can you tell me how many people smoke, how many kids smoke, how many whatever happens in such and such region. Usually you have to go off and plough through files and books and websites and having something like this that you could just pull something right up would be fabulous (Transcript 3, pg. 9).*

Meanwhile, the other researcher indicated they would use this tool in a different way: "I think that's useful, yes, certainly. That might be useful in terms of if you're working with students on something. That might be good because they can use that to help answer a series of questions" (Transcript 4, pg. 9).

In addition, one researcher expressed concern that the title of this function, **Ask a Question of the Data**, was misleading. This participant reported that after reading the title, they were expecting to be able to type their own questions, such as "Why are so many people

smoking in this region or why at that school" (Transcript 3, pg. 7). Further, the participant suggested addressing this issue by: "Maybe combining the data or something. I mean basically you're talking about cross referencing" (Transcript 3, pg. 7).

Another suggestion for modifications expressed by this researcher was with regards to the language used and the complexity of the instructions of this section. Specifically, they commented: "I found the instructions could be confusing to somebody who is not a researcher. Again, if you're thinking of some lay person, it's a bit complex" (Transcript 3, pg. 8). The other research participant interviewed did not raise these concerns.

Both researchers provided favorable feedback about the chart and map formats available for this function. While both researchers indicated they would use the chart format to pull information for themselves, they reported different uses for the map format: "I'm thinking of giving a presentation to a health region to say this is a visual representation of how many mothers smoke in [my province or in a region within my province] and this is where it's clustered" (Transcript 3, pg. 8) and "Particularly working with graduate students, but I can also see it in terms of utility for myself. As I said, it gives both the tabular and the visual with the map" (Transcript 4, pg. 10). This latter comment highlights the complementary uses of the maps and charts.

Health

Health participants interviewed also indicated they would use this function. One participant commented: "I think to me the most important part with regard to that one is the customization" (Transcript 6, pg. 14). Another participant indicated using this function to create material to include in presentations "I would create it and put it into a document or a PowerPoint or something like that and use it when giving presentations" (Transcript 1, pg. 10).

Concerns expressed by one of the research participants described above were also noted by health participants. First, both participants indicated that the title of the function was deceiving. One participant commented:

> *I guess the title is a bit deceiving, because I'm not really asking a question. That's something I had trouble with. Ask a question, well I'd like to type in a question. Especially because I'm so used to doing that with Googling, where you ask, how many Grade 6's have fathers who smoke? Or something like that. (Transcript 1, pg. 8)*

The other participant interviewed also expressed some confusion with the title. Participants made the following suggestions for modifications: "It's more like a summary format. That makes more sense to me" (Transcript 6, pg. 13) and "Maybe even 'Digging deeper into the data', 'Making sense of the data', 'Combining variables to answer your questions'. Something along those lines" (Transcript 1, pg. 8).

The concern with the level of the language used was also expressed by a health participant: "Yeah, it's just a matter of really bringing it down to a Grade 6 level. Bringing it down to a level that most of us will be able to understand" (Transcript 1, p.10). The other health participant interviewed did not share this particular concern.

One participant demonstrated a clear preference for the map format, citing "I'm much more diagrammatic. If you're using a PowerPoint when you're presenting people can see it at a glance and that's really helpful" (Transcript 1, p. 11). Meanwhile, the other participant felt that both the map and chart were equally valuable: "Whether it's in a map or it's a table, I think the customization is the real value there" (Transcript 6, pg. 14).

Education

Educators interviewed reported that this is a useful function to support their work. In particular, when asked how they would use this function, one educator responded:

> *I think I possibly would use it a little bit with my students, but I see this one more for me that I would want to use. I would probably play around with it ahead of time and figure out what are the three, four, or five most common factors that lead to a high percentage of smoking, like the mother smokers or that kind of stuff. That's where I would see it or showing kids, like we always do with alcohol, these are the four or five things which will lead you to getting the most drunk, like being small, not having eaten, etc. Trying to figure out again the four or give most correlating factors that make an individual most likely to begin smoking and continue smoking. (Transcript 5, pg. 10)*

The other educator interviewed also indicated interest in applying this function in the classroom. Specifically, the participant said: "It might be useful in a math class or something where kids have to make numbers come alive. It's an interesting one if you're investigating." (Transcript 2, pg. 10)

One educator also commented about the language used in this function, in particular with respect to the chart format: "The title, 'number matching aggregate query' and 'number matching separate query', I wouldn't even know what those mean. I would need some explanation or I would need a lay definition in there" (Transcript 5, pg. 8).

Both educators felt the map format was more useful than the chart format. Upon accessing the map format, one participant responded, "Yes, see that's what I like" (Transcript 2, pg. 10). This interest was echoed by the other educator interviewed when they made the following comment: "I like the map. Myself, I thought that would be something that's almost a little easier for me to get some ideas about. Like I would want to almost look and say, 'why are some of these things higher in certain areas than others'?" (Transcript 5, pg. 9)

The final suggested modification for this function was with regards to the maps used. One educator expressed a strong interest in being able to get oriented more easily on the map

obtained. Specifically, they suggested the following: "If you put your cursor over an area, if it could say like there's [region X] and there's [region Y], so you knew what city it actually was" (Transcript 5, pg. 10)

6.6 Information Resources

This section of the tool is divided into three sub-sections, including academic papers, links and resources, news. The goal of this section is to provide users with access to a number of resources. The academic papers section will contain key papers related to youth tobacco control and publications using SHAPES data. The links and resources section will provide easy access to commonly used information sources (e.g., Heart and Stroke Foundation of Ontario, Health Canada). Lastly, the news section will include information about upcoming conferences, workshops, and training opportunities.

Feedback on this section of the tool focused on asking participants whether they thought each of the subsections was useful to them. Participants were also asked what modifications, if any, they would make to each subsection. Responses, categorized by subsection and according to participant roles, are presented below.

6.6.1 Academic Papers

All Participants

Participants provided mixed responses with respect to this function. Only two participants indicated this was a useful function for them. The remaining four participants did not report interest in this function, either because academic papers are not particularly useful to them or because they already had satisfactory methods for accessing papers. Responses according to participant's roles are presented below.

Research

Only one researcher demonstrated interest in accessing academic papers related to SHAPES through this web tool. Specifically, this researcher commented:

> *Oh yes. I think this is very useful because a lot of times it's really hard to look at a bibliographic database to try to find things. Sometimes they're captured well, other times not. This way, as long as it was kept up to date and that must be a big challenge, it would be a very good resource. It actually would save a researcher a lot of time if they wanted to look at what papers were published using SHAPES and they could just go into this. (Transcript 4, pg. 10)*

The other researcher interviewed felt that this aspect of the tool was not very useful to them, however, indicated that others who do not have similar resources might find this useful. They said: "Probably not because I have list serves and library searches already on the go. For somebody who doesn't have these tools I think that would be interesting" (Transcript 3, pg. 9). This researcher suggested the following modification:

> *I also wondered about, and I don't know how this would work and how willing people would be, but if there would be a place here for some of the research that's going on...studies that are in progress and not yet finished, or even close to being published. You know, sometimes it takes so long to publish something that it's old by the time it gets out. Finding out what's going on while it's going on would be helpful. (Transcript 3, pg. 11)*

Health

Health participants interviewed also gave different responses with respect to this function. One participant, working at the local public health level, indicated that they use academic literature quite often and when asked whether this aspect of the tool would be useful, they replied "Absolutely" (Transcript 1, p.12). Further, this participant suggested the same modification as one researcher:

What I'd said here was that studies that are in progress. Really helpful because out in the field we sometimes hear about this, especially if you go to a National Conference and you see people's poster presentations and things in progress and is really, really helpful. Like, someone is totally doing what I'm thinking about. Well, I need to connect with this person because we have noticed this problem in our area too. And maybe, if it's something in progress, and if it's something relevant, we could actually contribute. (Transcript 1, pg. 11)

Meanwhile, another participant, working at the provincial/national level, indicated this would likely not be useful to support their work. This participant commented:

Well, yeah I potentially think it would be redundant. It would be definitely for myself because we already have a variety of tools and things that I access, but it doesn't mean that it may not necessarily be essential and necessary if you are driving people to this website. (Transcript 6, pg. 16)

Education

Both education participants indicated that they were unlikely to use this function, largely because of their lack of interest in academic literature. One participant commented:

It would be useful to me probably depending on the level they're written at. If they're written at like PhD level, probably not, but if they're written in just normal language I think I would look at them. Most of the time, if I had other choices, I would much prefer to go through a PowerPoint. (Transcript 5, pg. 12)

Given their lack of interest, neither educator suggested any modifications for this section.

6.6.2 Links and Resources

All Participants

Similar trends as with academic papers were reported with regards to this subsection of the tool, except among educators. Half of participants (N=3) reported that they would likely use this function. Already having access to this type of information was the main reason cited for lack of interest in this function.

Research

Researchers reported opposing views with regards to the utility of this function to support their work. One participant said: "Yes, I think that could be quite useful" (Transcript 4, pg.11). However, the other researcher interviewed cited: "I have that already, but I think it would be very useful for somebody else" (Transcript 3, pg. 10).

Health

Both health participants interviewed agreed that this was not likely to be a useful function for them. One participant made the following comment: "I already have most of these listed under my favorites, so I have my own way to get at this type of stuff" (Transcript 1, p. 11). A similar response was also given by the other participant interviewed:

> *Well, I'm not sure about the online resources and links as far as being something new because I use the Canadian Council for Tobacco Control's online resources and links. I'm also linked to Global Link. I suppose if people didn't know where to go and where to access information. To me, it could potentially just be recreating the wheel that already exists. There are numerous online resources for tobacco, some now being built for healthy eating, physical activity. (Transcript 6, pg. 16)*

This participant also suggested a practical way to address this issue by providing access to this type of information with relative ease in the following comment: "You have information and resources on any of these topics potentially going to other people who are charged with maintaining clearing houses and information centers, might be a more valuable use that recreating another whole process" (Transcript 6, pg. 16).

Education

Both education participants interviewed indicated interest in this section of the web tool, but for different reasons. One participant reported:

> *I usually go up to the health unit once or twice a year and raid them if they let me or at least get one or two resources and photocopy them here, if they're good ones. I like the kids to look at brochures and pamphlets and actually in our grade ten health class the kids, from looking at publicized brochures they have to make a brochure on a decision regarding abstinence or contraception or something like that. Getting these types of things online would be great. (Transcript 5, pg. 13)*

The other educator interviewed had a different vision for using the links and resources section of this tool: "Say for instance if there were groups that would come to school and offer presentations and stuff about smoking, I think that would be great" (Transcript 2, pg. 13). Education participants did not suggest any modifications to this subsection.

6.6.3 News

Research

While both researchers interviewed felt this was a useful section of the tool, one commented on the redundancy of this type of information: "I get it from other places but I think it would be useful for someone who didn't have easy access to this information" (Transcript 3, pg. 11). Moreover, the other research participant indicated a strong interest in this section of the web tool, as evident in the following comment.

> *Yes, I think that would be useful because sometimes you want to target your work or maybe you have some learning needs so you want to look at what workshops are available so I think that would be useful. Training opportunities particularly for students if they are interested in the area of tobacco control. (Transcript 4, pg. 12)*

In addition, this participant also indicated interest in expanding the training opportunity component to include funding opportunities, referring particularly to funding for investigators.

Health

With regards to this section, the provincial/national health participant interviewed reiterated that they already have access to this type of information: "Well, again it's the same thing, I get updates from as I said Global Link, CCTC [Canadian Council for Tobacco Control].

As far as workshops and training opportunities, I get that through PTCC [Program Training and Consultation Center]" (Transcript 6, pg. 16).

By contrast, the local health participant interviewed demonstrated a keen interest in this section. In particular, this participant commented:

> *Really helpful. I have a favorites of places that I go to, to keep an eye on what conferences are going on. But it's a few…you know, like Global Link and that sort of thing. But to have youth specific stuff, especially when you know you may have youth advocates within your community and can say 'Hey, here are some opportunities, here is where you can get some grant money in order to go.' You know, it's helpful. There are people out there that want to do that sort of thing. (Transcript 1, p. 12)*

Education

Educators were much less enthusiastic with regards to this section. When asked if this would be useful, one participant directly replied, "Not likely" (Transcript 2, pg. 13). The reason behind their lack of enthusiasm was quite simply because they felt that with the demands of their current positions, attending workshops and conferences would not be realistic. This reasoning is evident in the comment made by one of the participants:

> *I might check it out once in a while. I know I get all kinds of stuff for conferences and workshops, thinking I wish I could go, I wish I could go. But with teaching and family and coaching, it's usually almost unable to be done. I'm always interested but whether I can participate, I'm just not sure. (Transcript 5, pg. 15)*

Participants did not suggest any modifications for this section of the tool.

6.7 People Directory

This function allows users to search for others working in youth tobacco control with the purpose of fostering new partnerships and information sharing within the Canadian tobacco control community. Web tool users will be asked to fill out a brief registration form when logging into the system for the first time. The registration page will ask users to provide

personal information including name, interests, organization, role, and contact information. Users also have the option of keeping their contact information private.

Feedback on this section of the tool focused on asking participants whether they thought having a directory would be a useful option for them and whether they would be willing to include their personal information in the directory. Participants were also asked to suggest possible modifications. Responses according to participant roles are presented below.

All Participants

All participants demonstrated interest in the **People Directory**, although some expressed hesitation for different reasons. All participants also indicated that they would include their personal information in the directory, although opinions were mixed regarding keeping contact information private. Participants identified some modifications, especially with regards to contact information.

Research

Researchers interviewed also felt that the **People Directory** was useful, though with some reservations. One researcher first was hesitant when asked if they would include their personal information in the directory: "I would really think twice probably about releasing my name" (Transcript 4, pg. 14). However when they realized the tool would be password protected and members would be able to list their specific interests they commented:

> *But also in this context you're probably getting people who are really interested in contacting you because there would be more information. I probably would get more legitimate, important contacts rather than just contacts and having to delete them from email. (Transcript 4, pg. 14)*

The other researcher interviewed felt that "On the surface, it's a great idea" (Transcript 3, pg. 12), but expressed concern about getting "a lot of contact that you don't want" (Transcript 3, pg. 12). Further, this participant supported the private option, but commented: "I would just like

to have a little filter there rather than throw my name out there…it means if people have to contact me they have to write and that gives people a little pause for do I really want to talk to this person or not" (Transcript 3, pg. 13). However, this participant felt that this would be a useful tool for students: "I think it would be a very good tool for students to find other students that are doing that kind of research and maybe if they're looking for committee members" (Transcript 3, pg. 14).

Health

Both health participants interviewed felt the **People Directory** would be useful. However, one participant working at the provincial/national level indicated that despite being useful, it likely would not add value to them personally. They commented:
"Yes, I wouldn't probably use the people directory as much as I would see other people who don't know where to go. As I said, because of the networks that I'm already connected with" (Transcript 6, pg. 16). Further, this participant indicated it would likely be useful for individuals interested in tobacco control that may not have the access to these networks, such as people working at the school level. In particular, they commented:

> *Yes, again I think that where this would be valuable too is probably people that might come in through this system because they're at the school level, they've had SHAPES done, they're not necessarily connected to all of the various people and don't know necessarily where to go. Like you said it gives them an opportunity to potentially connect with people who may be of some assistance in helping them move something forward. I think there are people who are currently doing this although not everybody has access to it or knows of it and it probably would not hurt for people who are engaged in this process and being driven to it to know who is out there that might be able to help them out. (Transcript 6, p. 17)*

When asked if they would be willing to include their personal information in the directory, both researchers indicated they would. One participant commented: "Yeah, I would. Maybe not if I was an Executive Director because I know that you're just so busy and email is a

nightmare" (Transcript 1, pg. 13). In addition, with regards to contact information this participant felt that "having it private is not very useful" and added "People, if they don't want to be accessed, I don't think they should be on here at all" (Transcript 1, pg. 13). However, when asked about whether they would include their contact information, this participant replied: "Yes, but I think maybe not my direct line, but at least the line for my area so people can keep messages and maybe respond to people with queries" (Transcript 1, pg. 13). A similar comment was made by the other health participant interviewed: "Again, whether I would do it with my own direct line or I would do it here with just the main office line, I am not sure" (Transcript 6, pg. 18).

Education

Education participants also felt that the **People Directory** was useful. One educator commented they would use the directory in the following way: "Well, if I saw somebody who was either in my board or area and wanted to work on some projects together, I'd probably try to get a hold of them or hit them up for information" (Transcript 5, pg. 16). Meanwhile, the other educator interviewed indicated they would use the directory to "get speakers in" and to "identify other guidance counselors that have smoking programs in their schools, that had good ideas as to how to do it, I think that would be useful" (Transcript 2, pg. 14).

Neither educator expressed any reservations with regards to including their personal and contact information in the directory. In fact, one participant said: "Yes, I mean in education most of what we do is public. My name and number are on the website and the email address and stuff" (Transcript 2, pg. 14).

6.8 Additional Functions

All interview participants were provided with an opportunity to suggest additional functions that may be useful to them. Only one researcher and both health participants provided suggestions for potential additional functions.

One researcher indicated interest in expanding the web tool database (e.g., Smoking Behaviours Module) to include other SHAPES modules (e.g., physical activity, eating behaviours) by saying: "It would be nice if it could be expanded beyond tobacco. That would be fabulous. I think there is huge potential for this tool" (Transcript 3, pg. 14).

A health participant was interested in obtaining information about "youth programs that have had success with a direct link to that person's website or information on how you can easily get information so you can replicate" (Transcript 1, pg. 15).

A final additional function identified was to find some way to link data to context to help interpret it. Specifically, one participant suggested: "So, potentially data might get linked to changes in policy, strategies and tactics, and investment of resources so that we can actually interpret that data as to why this movement is up, down, why it's falling off" (Transcript 6, pg. 20). However, this participant also acknowledged the challenge of this proposed function by saying: "I can see this being a huge job as it moves forward" (Transcript 6, pg. 21).

6.9 Most Useful Function(s)

Participants were asked to indicate which function(s) of the tool they felt were the most useful to support their work with respect to youth tobacco control. While participant responses varied slightly, trends did emerge. Table 5 illustrates the most useful functions of the web tool identified according to participant's role.

Table 5: Most Useful Functions by Participant's Role

Participant's Role	Web Tool Function				
	Access Data	Create Report	Ask a Question	Information Resources	People Directory
Research	√√	√			
Health	√√	√	√		
Education		√√	√		

All health and research participants indicated **Access Data** was among the most useful functions of the tool. In addition, one researcher and health participant also reported **Create Reports** as one of the most useful functions. Furthermore, both educators ranked **Create Reports** among the most useful functions, while one educator also reported **Ask a Question of the Data** as one of the most functions. Lastly, **Ask a Question of the Data** was ranked as one of the most useful functions by a health participant.

6.10 Least Useful Function(s)

Participants were also asked to indicate which function(s) of the tool they felt were the least useful to support their work with respect to youth tobacco control. Despite differences among participant responses, trends became apparent. Table 6 provides a quick glance at the functions of the web tool rated as least useful by participant's role.

Table 6: Least Useful Functions by Participant's Role

Participant's Role	Web Tool Function				
	Access Data	Create Report	Ask a Question	Information Resources	People Directory
Research				√	√
Health				√√	
Education	√√				

By contrast to health and research participants who felt that **Access Data** was one of the most useful functions of the tool, educators listed this function as being the least useful to them. Further, **Information Resources** were listed as the least useful function of the tool by half of participants, including both health participants and one researcher. Finally, one researcher indicated that the people directory was the least useful function to support their work.

6.11 Confidentiality Issues

A major issue that needs to be addressed as the prototype web tool moves forward and is developed into a functional system is the confidentiality of data, particularly with regards to identifying schools. Issues of data confidentiality were probed during the interview, as participants were asked whether they felt they should have access to any data. Most participants felt that it was important to ensure individual-level confidentiality of data (i.e., to ensure individual students cannot be identified), but were less stringent with maintaining confidentiality at the school level (i.e., ensuring that schools cannot be identified). Comments made by participants regarding confidentiality are presented below according to participant's roles.

Research

Researchers interviewed expressed polar opposite views regarding having access to data. One researcher expressed their opinion in the following comment: "I would think that you should have access to all data. I think if you start getting into only certain people have access to certain data, you're opening up a big can of worms. I think it all should be accessible to everybody" (Transcript 3, pg. 15). By contrast, the other researcher expressed the importance of participant's consent with respect to confidentiality by saying:

> *Not unless the school gives me permission. I think in order to get schools to take part in our research we really do have to respect that. If it's okay with them and they know how we're going to use the data and what we're going to do, that's fine. Otherwise I think that we shouldn't just make it wide open (Transcript 4, pg. 16)*

Health

A health participant captured the essence of the confidentiality issue in the following comment: "I mean to me, I think that I could see where schools would not want to have any individual students identified but the unfortunate part is that you may also have schools who don't want to be identified" (Transcript 6, pg. 5). This prototype web tool is built around the concept of data and information sharing, with a primary purpose of learning from the experience of others and using others (e.g., schools, regions, provinces) as benchmarks to advance tobacco-control efforts. Taking away important identifiers to ensure the identity of schools remains confidential would severely compromise the utility of the tool. A health sector participant noted the limitations strict confidentiality at the school level would impose:

> *To me the real value added is not only that you might compare yourself and see where you are standing, but that you have the opportunity to have some lessons learned from those who are moving forward. I'm just not sure how the anonymity pieces are going to allow us to actually achieve some of those real lessons learned. (Transcript 6, pg. 21)*

A suggestion to address confidentiality issues alluded to by both health participants was to ask schools at the point of data collection whether they would be willing to share their data under specified circumstances. One participant commented: "It should go to people who can do something about it. Public health, nurses, tobacco links to promote people to take action. We also need to reassure schools that data will not be passed on to the media or shared with parents" (Transcript 1, pg. 15). Similarly, the other health participant said:

> *When people are giving their data if there is something that is said at the front end, would you want to have your data viewed by organizations that would be in the position to give you some assistance to move forward, are you willing to have it viewed by them? (Transcript 6, pg. 7)*

Education

Surprisingly, education participants did not feel confidentiality was a big issue. Moreover, one participant commented: “I would like to have data compared to other schools. I would like to know if we have crazy high rates or crazy low rates compared to other schools. I don’t see it as a big privacy issue to be honest” (Transcript 5, pg. 19). The other educator interviewed also made a similar comment about the limitations of confidential data: “This is a huge issue and if our school has a problem I think we should know we have a problem but how do we know if we can’t compare ourselves to other schools. I think as long as there are no [student] names associated with it” (Transcript 2, pg. 16).

7.0 Discussion

Phase I

7.1 User Characteristics

7.1.1 Sample Description

Efforts to have broad regional (i.e., Eastern, Central, Western Canada) and sector (i.e., research, health, education) representation were relatively successful. Distribution across sectors was much more successful than across regions. This is largely a reflection of the concentration of tobacco-control expertise in Central and Western regions of Canada and the nature of recruitment strategies (i.e., through existing networks of the thesis committee). This is particularly true with education participants, as it was difficult to identify appropriate individuals in Eastern and Western Canada. In addition, initial efforts attempted to separate local and provincial/national health participants. However, analysis of responses across both groups (each N=9) revealed minimal differences, thus groups were combined and reported jointly as health sector practitioners.

7.1.2 Participants' Education

All participants reported attaining some form of post-secondary education. As expected, researchers were the most highly educated group with 83% having received a doctoral degree. College diplomas were only reported as the highest level of education by three health sector practitioners. These results indicate that potential users of this web-tool at the research, health, and education levels are likely to have some degree of post-secondary education.

7.1.3 Self-reported Ability Ratings

First, it's important to note that finding information on the internet and performing common computer tasks (Task 1 and 2) are likely seen by users as less complex compared to the rest of the tasks listed (Task 3 - conducting data analyses using spreadsheets; Task 4 - conducting data analyses using statistical software; Task 5 - using computer mapping tools; Task 6 - using a set of data to answer questions; Task 7 - finding analyzed data to answer questions). For example, knowing how to conduct data analyses is more complex and difficult to define than knowing how to use a word processor. While using a word processor (e.g., Microsoft Word) is a relatively uniform task, data analyses could involve straight forward frequency calculations or complex multi-level modeling. Thus, participants' responses may have reflected this ambiguity.

High ability ratings on Tasks 1 and 2 indicate that the majority of participants feel quite comfortable using common computer applications (e.g., Microsoft Word) and the internet to find information. These ratings indicate they may be comfortable using a web-tool to support their work.

Researchers reported the highest level of comfort with respect to all tasks compared to health and education participants. Results are consistent with expectations, given that all researchers reported some level of post-graduate education and many of the tasks listed are skills often developed through graduate training (e.g., data analysis with statistical software). Similarly, most education participants reported having attained an undergraduate degree and also reported overall lowest comfort levels, especially with respect to Task 4.

Results suggest that researchers may demonstrate greater interest in functions that allow for analysis of SHAPES data compared to other potential users. Lower levels of comfort working with data expressed by educators and health participants suggests that, if they are

interested in data analysis functions, they may need more elaborate instructions and measures to simplify the use of such a tool.

Positive ratings reported for using geographical mapping tools indicate that this may be a function participants would be comfortable using, and should be considered when developing the prototype tool.

7.2 Current Practices

7.2.1 Frequency and Quality of Information Sources Used

Reported usage patterns of information sources were not surprising. A large majority of researchers used academic literature regularly. Further, lower proportions of researchers reported regular use of media and local government groups as information sources. The former may be explained by a greater awareness of media biases in reporting reliable information among researchers compared to other participants. Less regular use of local government groups may be a reflection of the scope of work research participants are involved in (i.e., provincial/national scope).

Health participants consistently reported regular use of information sources listed, with a large majority reporting at least weekly use of local, provincial and national government groups as information sources. Interpretation of these results should acknowledge that participants in this sector work within these groups making them more likely to seek information through their workplace (e.g., organization homepage).

The majority of education participants reported regular use of media and lay sources of information to support their work. These results are not surprising, especially lay sources

because educators likely belong to an extensive CoP, within their own schools and across school boards.

Generally, participants were satisfied with the quality (reliability, relevancy, and currency) of information sources listed. A notable discrepancy among participant ratings was with regards to the reliability of media information: the majority of researchers (83%) gave media poor reliability ratings, significantly less health (33%) and education (23%) participants reported poor ratings. This supports an earlier claim that researchers use media less frequently as a source of information, likely because of reliability concerns. These results may also help explain why educators report regular use of the media as an information source.

Results obtained in this section indicate that participants actively seek out a number of information sources to support their work. Thus, potential exists to facilitate this process by providing participants with links to a comprehensive set of resources to support their youth tobacco-control efforts.

7.2.2 Goals in Seeking Information

Evaluating programs or interventions to determine effectiveness and finding information to identify priorities for new programs were among the top three goals in seeking information reported by each sector. Further, research, health, and education participants reported conducting academic research, reporting to management or government, and finding information to create materials for programs as high priorities respectively.

These results carry implications for development, as these are potential areas that the web-tool can help support. Where possible, functions of the web tool should facilitate participants in achieving these goals. For example, providing educators with access to their school data (i.e., in summary form) can help them create relevant materials for their students

such as a pamphlet outlining smoking rates and policies at their school. Similarly, providing a means to identify high risk schools or communities (elevated smoking rates) across Canada can help set priorities to target resources more effectively.

7.2.3 Data Analysis Activities

Results for time spent working with data were consistent with expectations. Researchers reported the most time working with data followed by health participants. Educators reported the least time working with data, at least as defined in the current study. These results reflect the nature of participants' work roles, as researchers tend to work with data quite often whereas educators spend the majority of their time in the classroom.

Use of data analysis tools reported by participants was also not surprising. Microsoft Excel was the most common tool used by participants. Further, researchers reported using SPSS and SAS as the next most common tools, while very few health and education participants reporting using any other tools.

Results suggest that researchers would be most interested in working with a variety of data and software formats, particularly statistical software. The ideal would be to use standard data formats, such as CSV, that can be used by anyone irrespective of the software program they use to read the data (e.g., SAS). Large amounts of data collected 10-15 years ago are currently unusable because people encoded such data in proprietary software formats that are no longer used. The trend today is to develop interoperability data standards to be used by all software developers, not only those from a particular company (Olsen, Cutkosky, Tenenbaum, and Gruber, 1994).

7.3 Information Needs

7.3.1 Useful Types of Information or Data

Participants across sectors reported overlapping results with regards to useful types of information or data. Local smoking data were highly useful to participants in health and education. One explanation may be because of the local scope of participant's roles, particularly individuals working at the local health level. Provincial smoking data were very useful to researchers and health participants. These types of data are particularly useful to participants working at the provincial/national health level. Lastly, smoking profiles of schools or communities were rated as highly useful by the majority of research and education participants. While it is not surprising that most educators would find this type of information useful, it was unexpected that researchers would indicate this as highly useful information given that they reported lower ratings for local smoking data. However, results may indicate that researchers find added value in school or community reports (i.e., summary data compared to national benchmarks) compared to data alone.

These results have significant implications for prototype development. First, they suggest that providing users with access to SHAPES data is likely to be a useful function for all participants. Further, allowing users to access data by province and local regions can potentially meet the needs of large number of potential users. In addition, providing users with the ability to create SHAPES reports, and possibly customize reports, is likely to be a useful function.

7.3.2 Information or Data Uses

Researcher's top priorities for using information or data were to conduct secondary data analyses and to access materials for presentations or speeches. Results suggest that providing

researchers with access to data in a format that facilitates analysis (i.e., formats that can be readily imported into statistical software packages) would be useful. As mentioned above, allowing users to create reports based on SHAPES data is likely to be useful to participants. The prototype should provide users with an option to create reports using presentation software, such as Microsoft PowerPoint, to allow users to import and create presentations with this information easily.

Health participants indicated the most interest in using information or data to identify potential targets for interventions and to identify and share effective interventions. Thus, the prototype web tool should provide a platform for users to identify Canadian regions with elevated youth smoking rates (or other key indicators of smoking-related problems) and share experiences about effective programs and resources.

Using information or data to identify and share effective interventions was rated the highest priority for the greatest number of education participants. Creating materials to engage students in school projects was the second most popular priority for educators. This reinforces the idea that providing users with opportunities to connect and share information may be useful. Further, it indicates the potential for a function that allows (1) educators to access relevant information to use in their classrooms (i.e., smoking rates at a specific school); and/or (2) students, under the supervision of educators, to investigate and explore smoking issues in their schools. Questionnaire results and the implications discussed throughout this section provided the rationale for system functions and guided the creation of the web tool prototype.

Phase II

7.4 Access Data

Researchers and health participants found **Access Data** to be one of the most useful functions of the web tool and cited a number of ways they would use data extracted to support their work. Educators were clearly not interested in working with raw data as they reported this was the least useful function of the tool. Reasons for their lack of interest were primarily because of time and skill barriers. These results are consistent with expectations given that researchers and health workers are more likely to work with data in their roles, compared to teachers who spend the majority of their time working in the classroom.

Participants' comments regarding the data and software formats available indicate that providing several options is quite useful. Again, standard data formats that allow use in a number of proprietary software programs should be the gold standard. However, brief descriptions of each data format would be beneficial, particularly for users unfamiliar with some formats (e.g., CSV). This may limit unfamiliar users from being needlessly intimidated. That is, if a user sees formats they are unfamiliar with it may create anxiety and make them reluctant to use this function. A simple explanation indicating that CSV is a standard data format that can be imported into a number of software programs would help lay persons understand what this is and may help alleviate anxiety.

7.5 Create Reports

Create Reports was rated as one of the most useful functions by five of the six participants interviewed (both health and education participants and one researcher). Consistent with questionnaire results suggesting how information or data would be used by participants,

researchers indicated they would use reports for presentations and consultations in their respective communities. Health and education participants also indicated using reports as a tool to facilitate communication around youth smoking issues. Moreover, participants felt that creating reports directly in Microsoft PowerPoint was useful to support communication of report contents. One educator noted the utility of copying and pasting report sections to generate quiz questions easily. This demonstrates participants' intentions to use data for application purposes.

An important comment noted by a health participant in this section was the difference in languages used across provinces to identify regions. For example, the equivalent of an Ontario Public Health Unit in Nova Scotia is a Regional Health Council. This is an important consideration not only for this function but for the entire tool. A way to address these inconsistencies would be to link each province with province-specific language. Therefore, when users select a province, 'scope' menu bars are automatically updated to reflect the appropriate language.

7.6 Ask a Question of the Data

Ask a Question of the Data was seen as potentially useful to all participants. However, two important modifications were suggested: (1) altering the name of the function to more accurately reflect its capabilities; and (2) revising the language used in the instructions and particularly in the chart format option (e.g., number matching aggregate query).

Users indicated that the title of the function was deceptive because it gave them the impression that they could type in a question to be answered by the system. Thus, a more suitable title for this function is "Combining variables to build your own question". The important message to convey to potential users through the title of this function is that it allows

users to build their own questions by selecting and combining any variables and responses options (e.g., variable=grade, response=grade 10) available in the database.

Further, the language used in the instructions and the chart format must be simplified to avert the format from intimidating and confusing users. Figure 6 provides a screenshot of the chart format option of this section of the prototype, illustrating the language used.

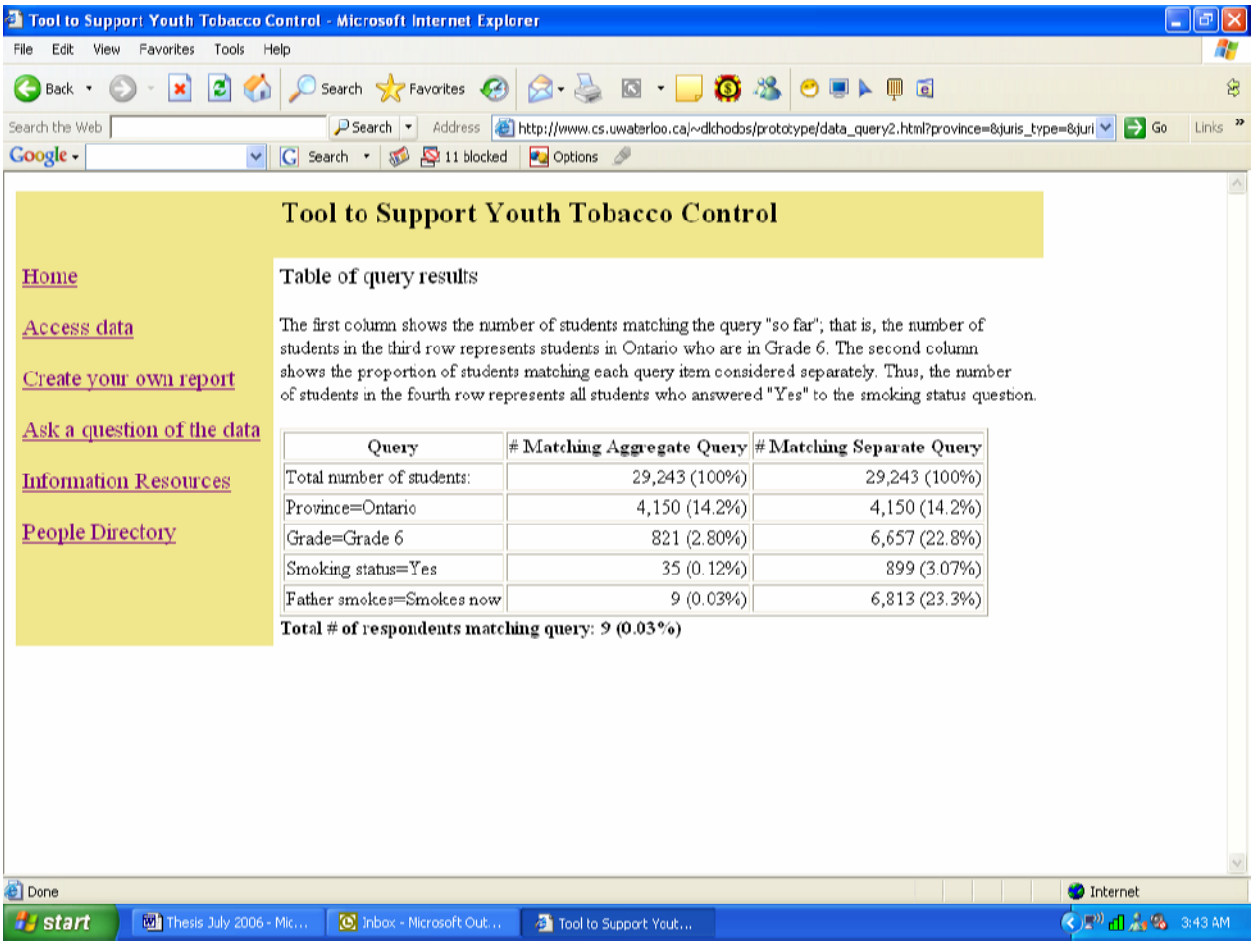


Figure 6: Ask a Question Function: Chart Format Option

Table 7 illustrates possible language modifications to the chart format option of this section of the tool.

Table 7: Ask a Question Function: Suggested Chart Option Modifications

Variable name (Response option)	Result combining variables N (%)	Result for each variable separately N (%)
Province (Ontario)	4150 (14.2)	4150 (14.2)
Grade (Grade 6)	821 (2.8)	6657 (22.8)
Smoking Status (Yes)	35 (1.2)	899 (3.07)
Father smokes (Current smoker)	9 (0.03)	6813 (23.3)

In addition, providing brief explanations when users place the cursor over a particular cell should also be considered. For example, placing the cursor over column B, row 5 would reveal the following explanation: Nine Ontario students, in Grade 6 who report they smoke also report that their father is a current smoker. These measures aim to simplify this function to maximize the likelihood that users will find it helpful.

Lastly, an educator expressed interest in using this function to identify factors correlated with youth smoking and presenting them to students. While this function can support this type of activity, it warrants caution that providing users with a "simple" way to do statistics (i.e., cross tabulations) may inadvertently encourage them to apply results incorrectly. For example, using this function a user may find that age and grade are highly correlated with youth smoking. They may incorrectly conclude that these are two variables strongly associated with youth smoking when in fact they are one highly correlated variable. There is likely no easy solution to address this concern; however, including a caution or disclaimer message outlining the nature of the issue may be helpful in making users aware of this possibility.

7.7 Information Resources

Participants reported mixed results regarding the **Information Resources** function. Essentially, participants who appeared to be more actively involved in the Canadian tobacco control community expressed the least interest in this section (i.e., a provincial/national health participant and a researcher), mainly because they already had practices in place to obtain these types of information. By contrast, participants who did not appear to be as integrated into the tobacco control community, especially educators, indicated interest in this function. This function was ranked as least useful for both health and one research participant. These trends may be related to participants' experience working in tobacco control. That is, more experienced participants would likely find this type of information redundant. Unfortunately, this cannot be confirmed because level of experience was not directly asked in either phase of this research. In retrospect, asking participants to indicate how many years of experience they have working in the field would have been useful. Including this question in Phase I might have also been a helpful consideration to guide selection of interview participants.

Results clearly indicated interest in having easy access to papers, links, and tobacco related news among some users. A clear recommendation that emerged for meeting this need comprehensively and efficiently was to direct users to websites or organizations that specialize in compiling and maintaining these types of information (i.e., links to commonly used information sources). Thus, efforts should focus on identifying reliable sources for this information and sending users to these sources. One such example may be the Program Training and Consultation Centre's Better Practices Toolkit (http://www.ptcc-cfc.on.ca/bpt/bpt.cfm). This toolkit, designed to help community workers in Ontario make the best use of limited resources, is a database of tobacco control interventions assessed by experts as 'recommended' or

'promising'. Recommendations are based on the Ontario context and experience. The toolkit also provides access to program materials that can be revised, as needed.

Another example of a potential source is GlobaLink (http://www.globalink.org). This web-based network serving the international tobacco control community provides a number of services, including news bulletins (international, regional, thematic), electronic conferences (allow users to exchange views on a broad range of issues), and full-text databases (instant access to many publications, guidelines, calendars and reports). Exploring the use of resources such as GlobaLink to complement the SHAPES web tool should be considered in future work.

7.8 People Directory

All participants agreed that the **People Directory** was useful, particularly for individuals new to tobacco control. Two participants, already well connected within the tobacco control community, saw this function as redundant given the resources they currently use (e.g., GlobaLink).

Some users were hesitant to include their direct contact information in the directory (i.e., direct telephone number), mainly for fear being contacted for irrelevant or inappropriate reasons. However, this fear is likely unsubstantiated since the SHAPES web tool will not be publicly accessible, but rather restricted to individuals with interest in youth tobacco control. As an alternative, some participants indicated they were more comfortable providing indirect contact information (i.e., phone number for an organization's switchboard).

The Personal Information Protection and Electronic Documents Act (PIPEDA) is an important piece of legislation to consider as the development of the People Directory moves forward. PIPEDA is designed to help protect the privacy of consumers in Canada by setting limits on and rules for the collection, use and disclosure of personal information collected in the

course of commercial activities. The Bill includes a set of guiding principles to be used for the collection, use and disclosure of personal information. PIPEDA applies to all organizations, including an association, a partnership, a person and a trade union (Statutes of Canada, 2000).

Under this legislation personal information is defined as information about an identifiable individual, but does not include the name, title or business address or telephone number of an employee of an organization. According to this definition, the majority of information likely to be included in the People Directory would not be classified as personal information and thus would be exempt from this legislation. However, the legislation does provide the following useful principles to consider: (1) identifying the purposes for which personal information is collected at the time of collection; (2) obtaining consent of individuals for the collection, use, or disclosure of personal information; (3) protecting personal information by security safeguards appropriate to the sensitivity of the information; and (4) informing individuals, upon request, of the existence, use, and disclosure of their personal information and providing access to that information to make modifications, if necessary (Statutes of Canada, 2000).

7.9 Additional Functions

Three main additional functions were identified by participants. First, one participant indicated interest in expanding the web tool to support work related to other health behaviours (e.g., physical activity). Initially, the web tool will be developed using the Smoking Behaviours Module of SHAPES. Once implemented and evaluated, the potential exists to expand the tool (or create a complementary tool) to address other health behaviours (SHAPES modules). Clearly, the potential to complement SHAPES with a web tool to facilitate access to and analysis of data collected is huge.

Another additional function mentioned was a way to identify successful programs (based on experience) with a direct link to an individual that can provide information to replicate the program. One way to address this need may by promoting the use of and providing access to the PTCC's Better Practices Toolkit in Ontario. Identifying or creating similar resources, with context applicable to other provinces would also be useful.

The final additional function identified was to incorporate a mechanism that links SHAPES data to strategies, programs, and tactics that provide context to explain data. In fact, users have expressed interest in identifying and learning from successful local strategies and tactics. This function would create capacity to learn from the experience of others and build practice-based evidence (Green, 2006). One way to accomplish this would be to identify an individual in every school (i.e., a key informant per set of data) who, upon request, would be willing and able to speak to the strategies (i.e., programs, policies, etc) employed by their school with regards to youth tobacco control. Therefore, when a user identifies a school with low smoking rates (i.e., a 'local champion'), they have a person to contact to learn about tobacco control efforts at that school and potentially share program materials.

Another option is to collect school/community level policy and program information in addition to items on SHAPES modules to help explain the individual level results. "Project Impact – Youth and Tobacco" (http://www.projectimpact.ca/index2.html) is an example of efforts to link data to school-specific context. This study is collecting data about (1) adolescent tobacco behaviours, (2) school policies/programs, and (3) community environment factors. Data are being collected across six Canadian provinces using (1) school-based surveys; (2) interviews of school personnel; (3) field observations; (4) document review of by-laws and policies; and (5) regional smoking rates (e.g., Canadian Community Health Survey). Thus, efforts to link data to

school/community context would be valuable and help foster a CoP of individuals working in youth tobacco control.

7.10 Confidentiality Issues

The concept of a SHAPES web tool is built around the idea of sharing data or information with others in the youth tobacco control community to learn from their experiences with the ultimate goal of helping individuals, communities/schools, and organizations move their tobacco control efforts forward. Confidentiality of data, particularly at the school-level (i.e., identifying individual schools) is a sensitive issue that must be appropriately addressed so that schools are comfortable sharing their data knowing it will be used to advance youth tobacco control efforts.

PIPEDA legislation may be more applicable in this context. According to this legislation, if an organization wishes to use personal information for uses it did not disclose while the data was being collected, it must first seek the permission of the people described by the data (Statutes of Canada, 2000). Thus, prior to using any SHAPES data, explicit permission to allow others to view results of school-level data collection must be obtained.

Lacking permission to share data and identify individual schools would severely compromise the value of the SHAPES web tool. First, without permission from schools to even share data, creating this web tool would not be possible. Further, if schools give permission to share data but do not wish to be identified it would limit the utility of the web tool since users would have access to data and information but without context. For example, how can a user benefit from knowing what strategies and tactics others in the field are currently using if they cannot be identified? In addition, strict confidentiality of data would hamper the ability of

schools or regions to compare themselves to and learn from other schools or regions. Thus, efforts should focus on encouraging schools to share their data or information.

One way to build the argument for sharing information is to clearly define parameters under which data or information will and will not be shared. For instances where information will be shared, the message should be framed to communicate clearly the value for schools. For example, clearly outlining that information or data will be shared with individuals or organizations in a position to provide assistance to schools to move their tobacco control efforts forward would likely be well received by school administrators making these decisions (e.g., principals). In addition, explicitly indicating efforts to minimize negative uses of information or data would help ease fears of school administrators (i.e., data or information provided will not be accessible to the general public or shared with the media without the schools' permission). Similar attention needs to be paid, and agreements arranged, with people who access the data base (i.e., they must agree not to expose names of participating schools).

Future work should continue to investigate issues of confidentiality to guide the development of the SHAPES web tool. Specifically, this work should aim to identify under which conditions school administrators would and would not consent to share school-specific information or data. One way to accomplish this would be to build a series of possible circumstances (e.g., if your school has high smoking rates and you wanted to find out what other schools in a similar position were doing) and ask school administrators whether they would agree to share information in each situation. These results would be very useful to develop parameters around the confidentiality of data contained in the web tool.

7.11 Limitations

Small sample size, in both phases, is a notable limitation of this study. Efforts to recruit 60 individuals from across Canada to participate in this study fell short of the mark (N=43), despite a number of reminder emails sent to potential participants. Further, because of time constraints, interviews were only conducted with six participants. Thus, results should be interpreted with caution given they may not be representative of the youth tobacco control community (researchers, health and education workers).

Despite efforts to encourage broad regional and sector participation, the majority of Phase I participants were from Ontario. Thus, results may not necessarily be representative of individuals working across Canada (particularly Eastern Canada). Phase II attempted to address this imbalance by including equal number of participants from Eastern, Central, and Western Canada.

While every effort to be objective during data analysis was made, theoretical sensitivities arising from the researcher's background and experiences may have biased data collection, analysis, and interpretation of results. Member checks and comparing interview transcripts with the researcher's notes attempted to address this limitation.

A final limitation relates to the nature of the prototype developed. The prototype tool developed was not actually functional but simply a set of demonstrations to give users an idea of the types of functions it could support. Therefore, feedback about the tool was at an abstract level (i.e., would a function like this be useful?). Users often responded "it depends" with regards to key issues. This was particularly evident when asking users to estimate how frequently they would use the tool, both as a whole and each function independently. Interview results, therefore, should be interpreted with this caution in mind. Technology carries the

potential to change an individual's behaviour (i.e., how they perform their work), thus, users may offer different responses when a functional version of the SHAPES tool is developed. For example, users may find they actually use a function they said would not be useful if a functional tool was developed. This work is limited to the first of the phase of an iterative development process, thus the question of how frequently users would use a given function is likely of little value because people have difficulty estimating usefulness (Vladan Devedzic, No Date). This should be addressed in later development stages, likely during evaluation (i.e., Phase 6 - Usability Testing) of the tool.

7.12 Development Recommendations

A summary of recommendations for development highlighted throughout this discussion is presented below.

7.12.1 Access Data

- Maintain function with several data format options, to be exported into data analysis software, such as Microsoft Excel, SAS, SPSS
- Add brief explanations of data format options (e.g., CSV–comma separated values is a data format that can be exported into a variety of software packages including Microsoft Excel, SAS, etc.)

7.12.2 Create Reports

- Maintain function with several data format options that allow making use of the data with different software, including Microsoft Word, Microsoft PowerPoint, and PDF

7.12.3 Ask a Question of the Data

- Title should be modified to more accurately reflect function (i.e., combining variables and response options)
- Language used in the instructions and chart format option should be simplified (see Figure 7)

7.12.4 Information Resources

- Focusing on developing and maintaining this function would be a misuse of resources given that other groups are currently conducting this work
- Efforts should focus on identifying reliable groups responsible for creating and maintaining this information and directing users to these

7.12.5 People Directory

- Users should have the option of what contact information they list (i.e., direct telephone line vs. general organization telephone line)
- Privacy option would not be helpful
- Users who do not wish to disclose their contact information should not be listed in the directory
- Users should have access to their directory listing to update or change information

7.12.6 Additional Functions

- A mechanism to link data to strategies and tactics used within that region should be developed

- One option is to identify "key informants" within schools who can provide contextual information to help interpret data
- Another option is to collect school/community level program and policy information to help explain data results

7.12.6 Additional Considerations

- Language variability across provinces with respect to regions and education councils/boards should be addressed
    - One option is to identify appropriate language in each province and link that information to the respective province
- Confidentiality parameters should be investigated and appropriate measures taken to ensure consent is obtained from schools to share data
- Future development efforts should explore the possibility of providing students with access to the web tool
    - An option for elementary and secondary school students is to access the web tool under the supervision of school staff (i.e., teacher)
    - An option for undergraduate or graduate students is to access the web tool through their research supervisor

Future work should focus on implementing these recommendations to develop a functional SHAPES web tool. Once implemented, research should focus on evaluation and eventually expansion of the tool to address other health behaviours (i.e., SHAPES physical activity and eating behaviour modules).

8.0 Conclusions

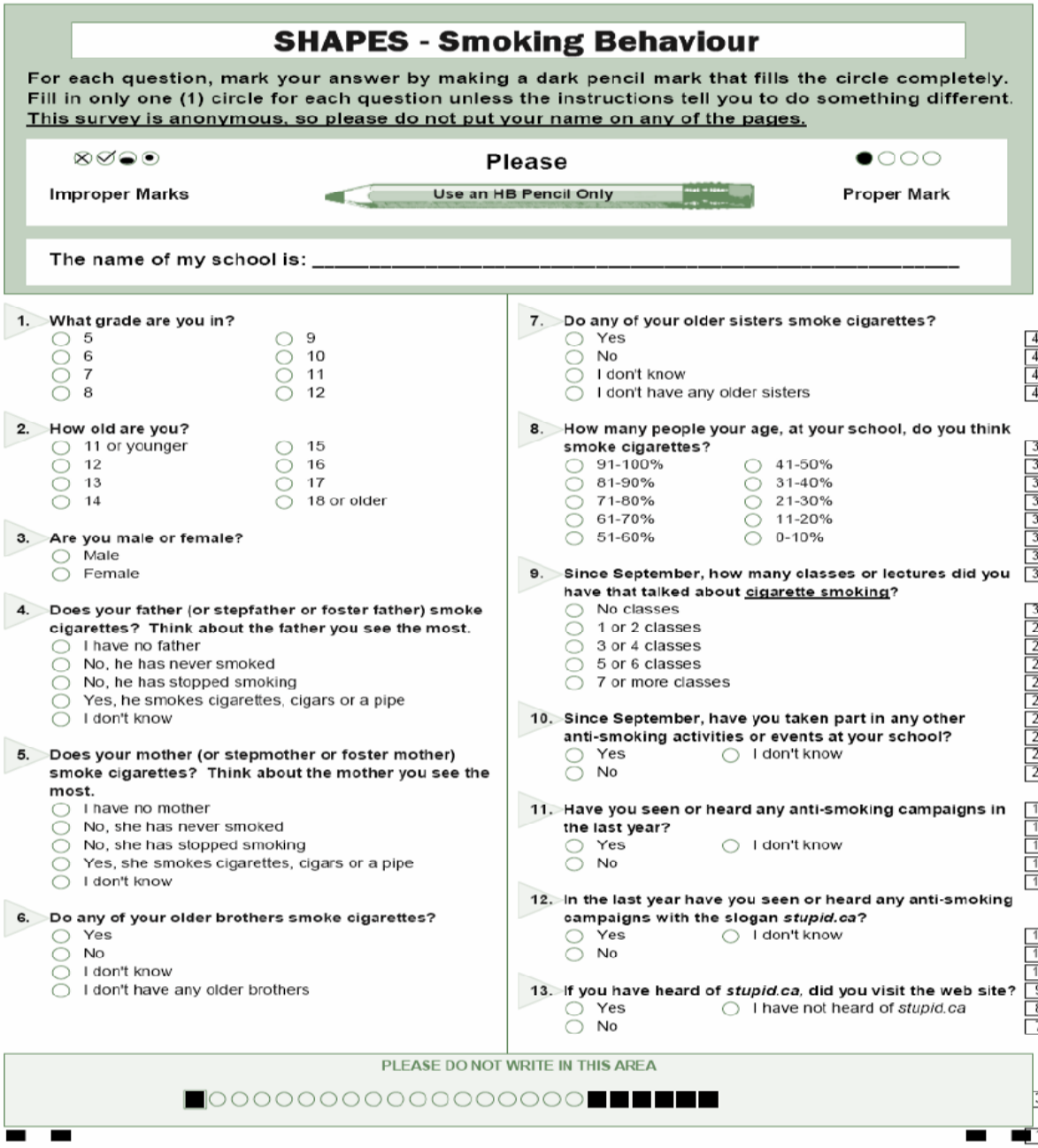
This research applied a user-centered approach to guide the development of a prototype web tool to facilitate access to and analysis of SHAPES data. Feedback from potential users is promising and indicates significant potential for such a tool. This tool can enable users to identify effective interventions, track the progress of school or health regions relative to benchmarks, and identify high risk schools or communities to target intervention efforts. Future work should use recommendations provided to create a functional system. Further, potential users should continue to be involved in this iterative process.

This research represented the first step in the development framework presented in section 2.5: a joint needs assessment and user analysis. Revisiting this framework after completing this research reveals a potential modification. In the framework presented prototyping is introduced in step 5. This study showed that prototypes can be very useful at earlier development stages. Despite limitations of a prototype that is not functional, the prototype tool successfully gave users an idea of the types of activities this tool could enable. Without something tangible to show potential users, it may be quite difficult for them to envision the tool and thus, their feedback may not have been very useful.

Further, this tool is an innovative way to maximize the use of available resources to help expand the CoP of individuals working in youth tobacco control, particularly individuals working in the education field. A functional web tool can create opportunities for users to learn from local tobacco control efforts and share experiences and resources. Expanding and strengthening the youth tobacco control CoP to include stakeholders from research, health, and education sectors aims to bridge the gap between research, policy, and practice.

Appendices

Appendix A – SHAPES Smoking Behaviour Module



SHAPES - Smoking Behaviour

For each question, mark your answer by making a dark pencil mark that fills the circle completely. Fill in only one (1) circle for each question unless the instructions tell you to do something different. This survey is anonymous, so please do not put your name on any of the pages.

Improper Marks — Please Use an HB Pencil Only — Proper Mark

The name of my school is: _____

1. What grade are you in?
   - ○ 5 ○ 9
   - ○ 6 ○ 10
   - ○ 7 ○ 11
   - ○ 8 ○ 12

2. How old are you?
   - ○ 11 or younger ○ 15
   - ○ 12 ○ 16
   - ○ 13 ○ 17
   - ○ 14 ○ 18 or older

3. Are you male or female?
   - ○ Male
   - ○ Female

4. Does your father (or stepfather or foster father) smoke cigarettes? Think about the father you see the most.
   - ○ I have no father
   - ○ No, he has never smoked
   - ○ No, he has stopped smoking
   - ○ Yes, he smokes cigarettes, cigars or a pipe
   - ○ I don't know

5. Does your mother (or stepmother or foster mother) smoke cigarettes? Think about the mother you see the most.
   - ○ I have no mother
   - ○ No, she has never smoked
   - ○ No, she has stopped smoking
   - ○ Yes, she smokes cigarettes, cigars or a pipe
   - ○ I don't know

6. Do any of your older brothers smoke cigarettes?
   - ○ Yes
   - ○ No
   - ○ I don't know
   - ○ I don't have any older brothers

7. Do any of your older sisters smoke cigarettes?
   - ○ Yes 45
   - ○ No 44
   - ○ I don't know 43
   - ○ I don't have any older sisters 42

8. How many people your age, at your school, do you think smoke cigarettes? 39
   - ○ 91-100% ○ 41-50% 38
   - ○ 81-90% ○ 31-40% 37
   - ○ 71-80% ○ 21-30% 36
   - ○ 61-70% ○ 11-20% 35
   - ○ 51-60% ○ 0-10% 34

33

9. Since September, how many classes or lectures did you have that talked about cigarette smoking? 32
   - ○ No classes 30
   - ○ 1 or 2 classes 29
   - ○ 3 or 4 classes 28
   - ○ 5 or 6 classes 27
   - ○ 7 or more classes 26

25

10. Since September, have you taken part in any other anti-smoking activities or events at your school? 24
    - ○ Yes ○ I don't know 23
    - ○ No 22

21

11. Have you seen or heard any anti-smoking campaigns in the last year? 19
    - ○ Yes ○ I don't know 18
    - ○ No 17

16

15

12. In the last year have you seen or heard any anti-smoking campaigns with the slogan *stupid.ca*?
    - ○ Yes ○ I don't know 12
    - ○ No 11

10

13. If you have heard of *stupid.ca*, did you visit the web site? 9
    - ○ Yes ○ I have not heard of *stupid.ca* 8
    - ○ No 7

PLEASE DO NOT WRITE IN THIS AREA

3

1

14. Are you exposed to smoking at your job?

62 ◯ Yes
61 ◯ No
60 ◯ I do not have a job outside of school
59

15. Have you ever been curious about smoking a cigarette?

58 57 ◯ Yes ◯ No
56

16. Have you ever smoked a cigarette, even just a few puffs?

55 54 ◯ Yes ◯ No

17. Have you ever smoked a whole cigarette?

52 ◯ Yes
51 ◯ No
50 ◯ I have never smoked
49
48

18. Have you smoked 100 or more whole cigarettes in your life?

47 46 ◯ Yes
45 ◯ No
44 ◯ I have never smoked
43

19. Think about the last 30 days. Did you smoke a cigarette, even just a few puffs?

41 40 ◯ Every day ◯ 1 or 2 days
39 ◯ Almost every day ◯ Not at all
38 ◯ Some days
37
36

20. Think about the last 30 days. On the days that you smoked, how many cigarettes did you usually smoke?

35 ◯ I did not smoke at all
33 ◯ A few puffs in a day
32 ◯ 1-2 cigarettes in a day
31 ◯ 3-5 cigarettes in a day
30 ◯ 6-10 cigarettes in a day
29 ◯ 11-19 cigarettes in a day
28 ◯ 20 or more cigarettes in a day
27

21. In the last 12 months, how often did you smoke?

24 ◯ I have never smoked
23 ◯ I have smoked, but not in the last 12 months
22 ◯ I have tried one cigarette in the last 12 months
21 ◯ I have had more than one cigarette in the last 12 months

22. Are you a smoker?

18 ◯ Yes ◯ No
17

23. Do you think in the future you might try smoking cigarettes?

16 15 ◯ I already smoke ◯ Probably not
14 ◯ Definitely yes ◯ Definitely not
13 ◯ Probably yes
12
11

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

10 9 ◯ Definitely yes ◯ Probably not
8 ◯ Probably yes ◯ Definitely not
7

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

4 3 ◯ Definitely yes ◯ Probably not
2 ◯ Probably yes ◯ Definitely not
1

26. Do you plan to quit smoking cigarettes?

◯ I have never smoked
◯ I have only smoked a few times
◯ I have already quit
◯ Yes, within one week
◯ Yes, within 30 days
◯ Yes, within six months
◯ Yes, within one year
◯ Yes, but I'm not sure when
◯ No, I do not plan to quit smoking

27. How long ago did you quit smoking?

◯ I have never smoked
◯ I have only smoked a few times
◯ I am still smoking
◯ I quit less than 2 weeks ago
◯ I quit between 2 weeks and 6 months ago
◯ I quit between 6 months and one year ago
◯ I quit more than one year ago

28. How many times in the past year have you tried to quit smoking?

◯ I have not smoked in the last year
◯ I have only smoked a few times in the last year
◯ I have not tried to quit in the last year
◯ I have tried to quit once in the last year
◯ I have tried to quit 2 times in the last year
◯ I have tried to quit 3 times in the last year
◯ I have tried to quit 4 or more times in the last year

29. How sure are you that you could quit smoking if you wanted to?

◯ Very sure ◯ I do not smoke
◯ Sure ◯ I have only smoked a few times
◯ Unsure ◯ I do not want to quit
◯ Very unsure

30. Your closest friends are the friends you like to spend the most time with. How many of your 5 closest friends <u>smoke cigarettes</u>?

◯ None ◯ 3
◯ 1 ◯ 4
◯ 2 ◯ 5

31. Is there help available at this school for students who want to quit smoking?

◯ Yes
◯ No
◯ I don't know

32. Would you join a program to help you quit smoking if one was offered at your school?

◯ Yes
◯ No
◯ I do not smoke cigarettes anymore
◯ I have never smoked

33. Do you think all public places (e.g., restaurants, malls, arcades, etc.) should be smoke-free?

◯ Definitely yes ◯ Probably not
◯ Probably yes ◯ Definitely not

34. How often do you smoke in each of the following places?	Often	Sometimes	Never	I don't smoke	
a) At home	○	○	○	○	61
b) Walking to and/or from school	○	○	○	○	60
c) At school but off school property	○	○	○	○	59
d) At school on school property	○	○	○	○	58
e) At concerts/dances/clubs	○	○	○	○	57
f) In restaurants/coffee shops	○	○	○	○	56
g) At parties	○	○	○	○	55
h) Other:_____	○	○	○	○	54

35. How often do you smoke at the following times?	Often	Sometimes	Never	I don't smoke	
a) Before school	○	○	○	○	50
b) During the school day	○	○	○	○	49
c) After school	○	○	○	○	48
d) In the evening	○	○	○	○	47
e) On weekends	○	○	○	○	46
f) Other:_____	○	○	○	○	45

36. How often do you smoke with the following people?	Often	Sometimes	Never	I don't smoke	
a) By myself	○	○	○	○	41
b) With my parents	○	○	○	○	40
c) With other family members	○	○	○	○	39
d) With friends	○	○	○	○	38
e) Other:_____	○	○	○	○	37

37. If you were thinking about quitting smoking, rate whether you might use the following ways to quit.	I don't smoke	Definitely	Maybe	Never	
a) A self-help booklet	○	○	○	○	32
b) Group meetings at school	○	○	○	○	31
c) My doctor	○	○	○	○	30
d) Chat room on the Internet	○	○	○	○	29
e) Information site on the Internet	○	○	○	○	28
f) Teacher, guidance counsellor, or school nurse	○	○	○	○	27
g) Free telephone quit line	○	○	○	○	26
h) Friend's advice	○	○	○	○	25
i) Quit on my own	○	○	○	○	24
j) Nicotine gum or nicotine patch	○	○	○	○	23
k) Other:_____	○	○	○	○	22

38. How strongly do you agree or disagree with each of the following statements?	Strongly Agree	Agree	Disagree	Strongly Disagree	
a) I feel close to people at my school.	○	○	○	○	17
b) I feel I am part of my school.	○	○	○	○	16
c) I am happy to be at my school.	○	○	○	○	15
d) I feel the teachers at my school treat me fairly.	○	○	○	○	14
e) I feel safe in my school.	○	○	○	○	13

39. How many students at this school smoke where they are not allowed to?

○ A lot ○ A few
○ Some ○ None

40. This school has a clear set of rules about smoking for students to follow.

○ True ○ False
○ Usually true ○ I don't know
○ Usually false

41 I often see students smoking near this school. 10

○ True ○ Usually false
○ Usually true ○ False 9
8

42. If students are caught breaking the smoking rules at this school, they get into trouble.

○ True ○ False 5
○ Usually true ○ I don't know 4
○ Usually false 3
2
1

43. In the last 30 days, how often have you noticed cigarette packs displayed behind the counter at convenience stores, corner stores, or gas stations?

60 ◯ Never
59 ◯ Sometimes
58 ◯ Always
57 ◯ Haven't been to one of these stores in the last 30 days

44. In the last 30 days, how often have you noticed cigarette packs displayed on the counter at convenience stores, corner stores, or gas stations?

52 ◯ Never
51 ◯ Sometimes
50 ◯ Always
49 ◯ Haven't been to one of these stores in the last 30 days

45. How tall are you without your shoes on? (Please write your height on the line and then fill in the appropriate numbers for your height in feet and inches **OR** centimeters.)

"My height is _____"

Example: 5 ft 7in

Height		OR	Height		OR	Height
Feet	Inches		Feet	Inches		Centimeters
0	● 0		0	0 0		0 0 0
1	1 1		1	1 1		1 1 1
2	2		2	2		2 2 2
3	3		3	3		3 3
4	4		4	4		4 4
●	5		5	5		5 5
6	6		6	6		6 6
7	●		7	7		7 7
	8			8		8 8
	9			9		9 9

38 37 36 35 34 33 32 31 30 29

46. How much do you weigh without your shoes on? (Please write your weight on the line and then fill in the appropriate numbers for your weight in pounds **OR** kilograms.)

"My weight is _____"

Example: 127lbs

Weight		OR	Weight		OR	Weight
Pounds			Pounds			Kilograms
0 0 0			0 0 0			0 0 0
● 1 1			1 1 1			1 1 1
2 ● 2			2 2 2			2 2
3 3 3			3 3 3			3 3
4 4			4 4			4 4
5 5			5 5			5 5
6 6			6 6			6 6
7 ●			7 7			7 7
8 8			8 8			8 8
9 9			9 9			9 9

15 14 13 12 11 10 9 8 7 6

47. Your closest friends are the friends you like to spend the most time with. How many of your 5 closest friends are physically active?

◯ None ◯ 3
◯ 1 ◯ 4
◯ 2 ◯ 5

HARD physical activities are jogging, team sports, fast dancing, jump-rope and any other physical activities that increase your heart rate and make you breathe hard and sweat.

48. Mark how many minutes of HARD physical activity you did on each of the last 7 days. This includes physical activity during physical education class, lunch, recess, after school, evenings, and spare time.

For example: if you did 1 hour and 15 minutes of hard activity on Monday, you will need to fill in the 1 hour circle and the 15 minute circle, as shown below:

	Hours					Minutes			
Monday	0	●	2	3	4	0	●	30	45

	Hours					Minutes			
Monday	0	1	2	3	4	0	15	30	45
Tuesday	0	1	2	3	4	0	15	30	45
Wednesday	0	1	2	3	4	0	15	30	45
Thursday	0	1	2	3	4	0	15	30	45
Friday	0	1	2	3	4	0	15	30	45
Saturday	0	1	2	3	4	0	15	30	45
Sunday	0	1	2	3	4	0	15	30	45

MODERATE physical activities are lower intensity activities such as walking, biking to school, and recreational swimming.

49. Mark how many minutes of MODERATE physical activity you did on each of the last 7 days. This includes physical activity during physical education class, lunch, recess, after school, evenings, and spare time.

For example: if you did 2 hours and 45 minutes of moderate activity on Monday, you will need to fill in the 2 hour circle and the 45 minute circle, as shown below:

	Hours					Minutes			
Monday	0	1	●	3	4	0	15	30	●

	Hours					Minutes			
Monday	0	1	2	3	4	0	15	30	45
Tuesday	0	1	2	3	4	0	15	30	45
Wednesday	0	1	2	3	4	0	15	30	45
Thursday	0	1	2	3	4	0	15	30	45
Friday	0	1	2	3	4	0	15	30	45
Saturday	0	1	2	3	4	0	15	30	45
Sunday	0	1	2	3	4	0	15	30	45

3 2 1

Appendix B – Sample Feedback Report

This is a prototypical report – data are fictitious

Smoking at AnyPlace Secondary School, Ontario

University of Waterloo

National Cancer Institute of Canada | Institut national du cancer du Canada

Canadian Cancer Society | Société canadienne du cancer

Your Confidential Report

This School Smoking Profile report presents the results of a survey conducted at AnyPlace Secondary School in May 2004 by the Health Behaviour Research Group at the University of Waterloo and the Canadian Cancer Society/National Cancer Institute of Canada's Centre for Behavioural Research and Program Evaluation.

This survey helps to investigate how to effectively assist community leaders (educators, students, and public health workers) to accurately measure local youth smoking rates and behaviours.

Please note that if the number of students responding in a school is small enough that it might be possible to identify individual student responses, findings are not reported. In these cases, data points are missing from charts and are replaced by an asterisk in tables. Please note that in some cases, table columns or rows and charts may not add to 100% due to rounding.

Our research team will be distributing this report only to school administrators and those individuals selected to attend the school feedback meeting. Any results that are published or otherwise disseminated by the researchers will maintain the anonymity of your school. School officials should decide how best to distribute this report to meet needs. We do encourage you to partner with [public health org] and voluntary organizations to take action on the findings reported here. You can reach [public health org] at [phone number] or [email].

For more information on this report, or the research project associated with it, please contact:

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The Issue

Smoking is a Public Health Problem

- 22% of all deaths in Canada are attributable to smoking.[1] SMOKING causes 4 times as many deaths as car accidents, suicide, homicide and AIDS combined.[2]
- Half of all long-term smokers will die or be disabled by a smoking-related illness.[3]

Smoking is an Adolescent Problem

- 85 percent of current smokers start smoking by the age of 19.[4]
- The average age at which students smoke their first whole cigarette is 13.[5]
- What starts as a bid for *independence* quickly becomes *dependence* on tobacco. Only 5% of student smokers think that they will be smoking in 5 years - 5 years later, 80% of them are heavy smokers.[6]

> *Today's teenager is tomorrow's potential regular customer, and the overwhelming majority of smokers first begin to smoke while still in their teens…The smoking patterns of teenagers are particularly important to Philip Morris.*
> (1981 report by researcher Myron E. Johnson, sent to Robert E. Seligman, Vice President of Research and Development, Philip Morris)

Smoking is a Community Problem

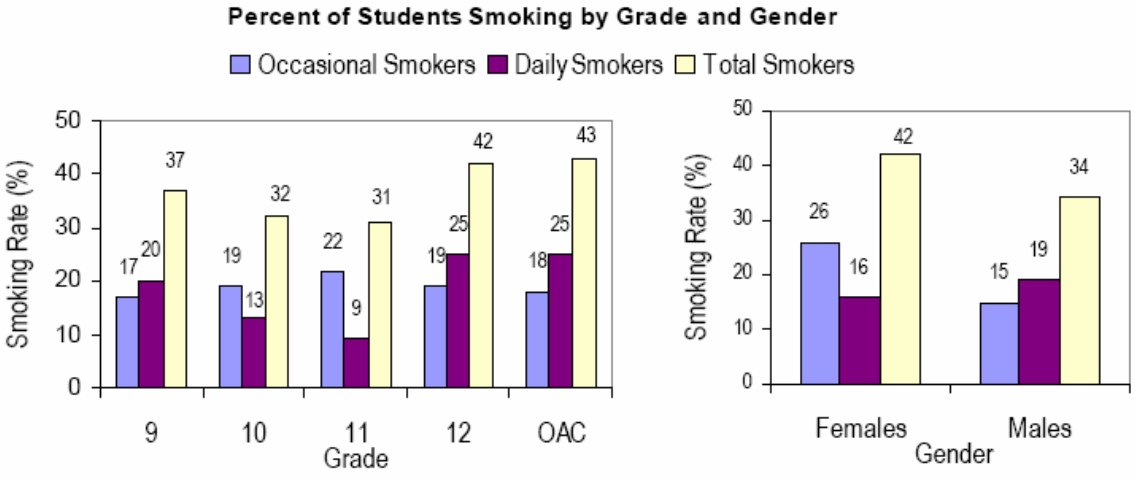
- Smoking is more predictive of dropping out than marijuana use or alcohol use.[7]
- Students who take up smoking show a decrease in academic achievement and motivation.[8]
- Starting smoking at an early age is predictive of a number of other risk behaviours; these include carrying a gun or other weapon at school, fighting, and drug use.[9]

Should We Take Action?

School and school board efforts linked with local public health and community agency efforts can reduce problems related to youth smoking. Research has shown that a comprehensive approach to tobacco control is most successful.

Who Smokes at AnyPlace

Overall 37% of the students we surveyed at AnyPlace reported that they are currently smoking. The graphs below summarize the percentage of students who smoke by grade and by gender. For these graphs, an occasional smoker is defined as a person who currently smokes cigarettes, but not every day. A daily smoker currently smokes cigarettes every day.



The Canadian Tobacco Use Monitoring Survey[10] indicates that 19% of youth ages 15-19 in Ontario are current smokers. When compared[1] to this rate, the smoking rate at AnyPlace is:*

Very High	High	Average	Low	Very Low

**Smoking rates greater than 10% above Ontario's provincial smoking rate (19%) are considered "Very High."

Should We Take Action?

Implementing programs and/or policies that would lead to even a 5% absolute reduction in smoking prevalence at AnyPlace, would result in the prevention of an estimated 43 students becoming long-term smokers. This would save 22 students from death or disability from a smoking-related illness. School programs to prevent tobacco use can make a major contribution to the future health of young people, especially when these programs are combined with community efforts. The resource list appended to this report is a good starting point for planning interventions.

We asked students, *"How many people your age do you think smoke cigarettes?"* The results show that the majority (80%) of students at AnyPlace believe that smoking is more common than it is:

Students' Perceptions of Peer Smoking Rates

Response options (%)	Percentage of Students Responding		
	Non-smokers	Smokers	All
91-100	2	3	3
81-90	8	13	10
71-80	19	27	22
61-70	18	19	18
51-60	15	16	15
41-50	14	8	12
31-40	14	11	13
21-30	7	3	5
11-20	2	0	1
0-10	1	0	1

80% of respondents overestimated*

7% of respondents underestimated*

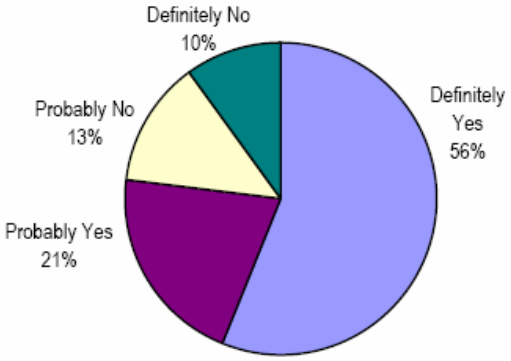
* relative to AnyPlace's estimated smoking rate of 38%

Should We Take Action?

Correcting misperceptions can alter students' attitudes about smoking, especially those related to the creation of "peer pressure". Communicating these results in the school newspaper, on a bulletin board, in an assembly or in other ways may help to show students that smoking is not as common as they think. Remember that repeated long-term exposure to these new ideas will be necessary to change attitudes about smoking.

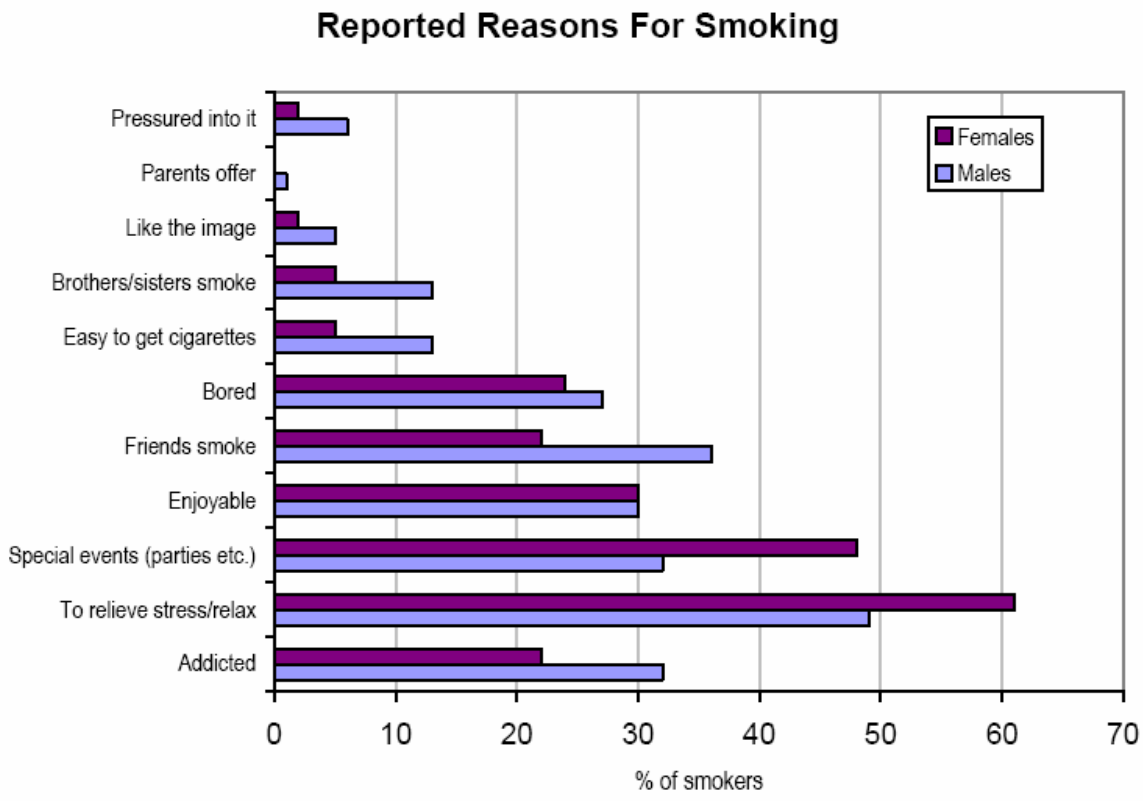
Students may also underestimate how supportive their peers are of tobacco control initiatives such as smoke-free public places. Seventy-seven percent of the AnyPlace students surveyed responded 'probably yes' or 'definitely yes' to the question, "*Do you think all public places (e.g., malls, arcades, restaurants, etc.) should be smoke free?*" Making your students aware of this information may help them to feel that it is okay to speak out in favour of non-smoking. Getting kids involved in advocating for smoke-free public places may also reduce the likelihood they will start to smoke.

Students Supporting Tobacco Control Initiatives



Why AnyPlace Students Smoke

We asked students who consider themselves smokers, to select all that apply from a list of reasons for smoking. Their responses demonstrate the wide range of motivations for smoking among students at AnyPlace. The two most popular responses were related to the use of smoking during special events and as a stress reliever.



Thirty-five percent of students who smoke selected, "*My friends smoke,*" as a reason for their own smoking. This indicates that for these students, the uptake and maintenance of the smoking habit is influenced by social factors, including peers.

We asked students at AnyPlace about their exposure to smoking among their friends and family, and at work.

All students were asked, "*How many of your 5 closest friends smoke cigarettes?*" Smokers are far more likely to report that they have friends who smoke compared to non-smokers. In fact, 45% of non-smokers report that none of their 5 closest friends smoke cigarettes, and 44% of daily smokers report that ALL five of their closest friends smoke.

How many of your 5 closest friends smoke cigarettes?	% of Students Responding		
	Daily Smokers	Occasional Smokers	Non-Smokers
0	4	9	45
1	6	12	18
2	6	16	20
3	13	23	9
4	27	21	2
5	44	19	6

Students were asked if their father, mother, or older siblings smoked. Again there is a noticeable difference in the experiences of smokers and non-smokers. Smokers are far more likely to have an immediate family member who smokes.

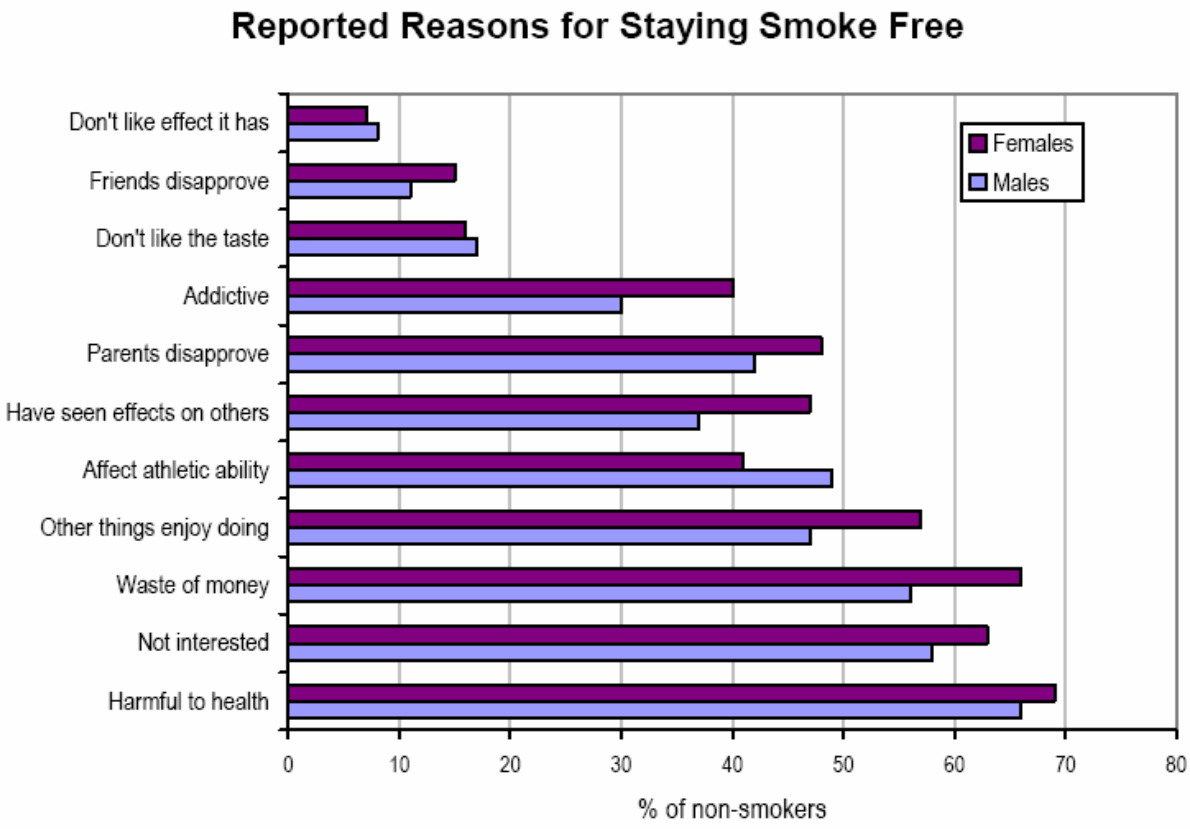
Family Member Smokes	% of Students Responding		
	Daily Smokers	Occasional Smokers	Non-Smokers
Father	46	33	28
Mother	38	29	19
Older Sibling	45	25	16

Not only are students whose parents smoke more likely to become smokers themselves,[11] but it is also a health concern if the family member smokes in the home. At least one person smoked on a daily basis inside the home of 44% of smokers at AnyPlace compared to only 30% of non-smokers.

On the job exposure to smoking is a health concern, but it can also be an important catalyst to future smoking. Fifty-two percent of AnyPlace students included in this survey reported that they have a job outside of school; 37% of these students reported exposure to smoking on the job.

Home is the predominant setting of environmental tobacco smoke exposure among children because of the hours they spend there, although among middle and high school students, exposure at school and among peers becomes increasingly important.
Source: Legacy First Look Report 6, Youth Exposure to Environmental Tobacco Smoke, American Legacy Foundation, May 2001

It is important to understand and eliminate, where possible, factors that prompt students to smoke. It is equally important to recognize and reinforce motivations for staying smoke-free. We asked non-smoking students to identify reasons they choose NOT to smoke. Students were asked to select all reasons that apply to them. As seen in the following graph, health concerns and waste of money were the two most popular reasons cited by the non-smokers at AnyPlace.



"What is notable about tobacco use is that it consistently occurs early in the sequence of problem behaviours. When a young person starts to smoke or use tobacco, it is a signal, an alarm that he or she may get involved in other risky behaviours. This is one of the few early warning signs we have in public health. If we can prevent tobacco use in the first place, we might have a big impact on preventing or delaying a host of other destructive behaviours among our young people." Former U.S. Surgeon General Jocelyn Elders

The pharmacological and behavioural processes that determine tobacco addiction are similar to those that determine addiction to such drugs as heroin and cocaine.
Source: US Department of Health and Social Services, Report of the Surgeon General, 1988.

There is increasing evidence that school environment plays an important role in supporting students' abilities to stay smoke-free. Students who feel an attachment to their school, and who consider their teachers to be supportive are less likely to smoke or to engage in other unhealthy or risky behaviours.[12,13,14] Activities to build a positive school community might be helpful in reducing smoking at AnyPlace. Here is what AnyPlace students said about the school environment:

How strongly do you agree or disagree with the following statements?	Percentage of Students Responding			
	Strongly Agree	Agree	Disagree	Strongly disagree
I feel close to people at this school.	27	54	14	5
I feel I am part of this school.	36	51	9	4
I am happy to be at this school.	32	50	11	7
The teachers at this school treat students fairly.	18	60	16	6
I feel safe in my school.	32	57	6	5

School-based smoking prevention programs should:

- include at least 10 sessions devoted specifically to tobacco use prevention
- be delivered in at least two school years (sessions may be blocked or distributed over the year)
- begin immediately before the age when uptake of tobacco is highest, usually just before the transition to middle or secondary school
- focus on short-term health and social consequences (e.g., shortness of breath and smelly clothes)
- include training in refusal skills including modeling and practice of resistance skills
- include information on social influences on tobacco use especially peer, parent and media and demonstrate that smoking is not normative for adolescents
- involve students in the delivery of the program (teacher led with student involvement works best)
- include adequate teacher training and a high level of teacher commitment to the program

Source: Health Canada and the Canadian Cancer Society -- efficacy criteria used in the assessment of smoking prevention programs.[15]

Where, When, and With Whom AnyPlace Students Smoke

We asked students who consider themselves smokers where, when, and with whom they smoke. Their responses to these questions provide a more complete picture of smoking at AnyPlace and give indications of how to provide meaningful programming to address smoking.

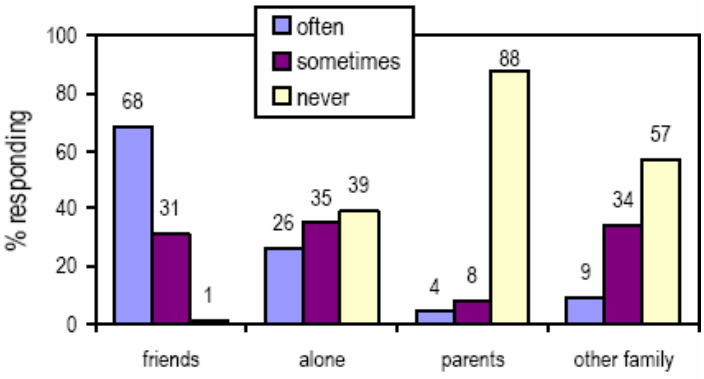
Most students who smoke at AnyPlace report that they often smoke with friends and seldom smoke with parents or other family.

Notice that 26% of students who smoke at AnyPlace report that they often smoke alone. This indicates that there is a notable group of smokers for whom smoking is no longer a social activity - an indication of addiction.

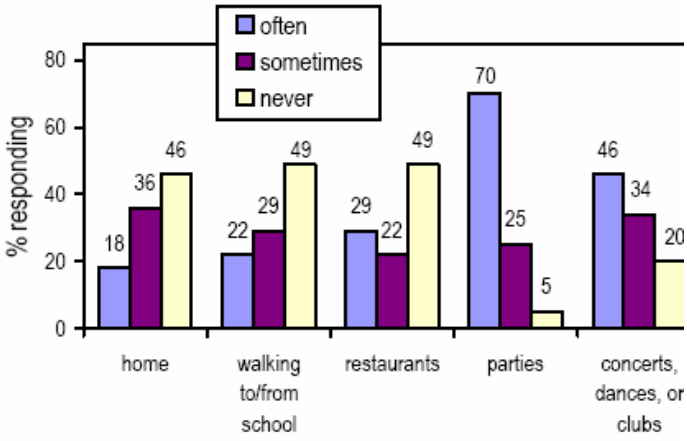
Students were more likely to report that they often smoke at places like parties and concerts rather than at home. This is consistent with *when* students report that they "***often***" smoke:

- on weekends - 65%
- in the evening - 43%
- after school - 39%
- during the school day - 37%
- before school - 25%

Who Students Smoke With



Where Students Smoke



Should We Take Action?

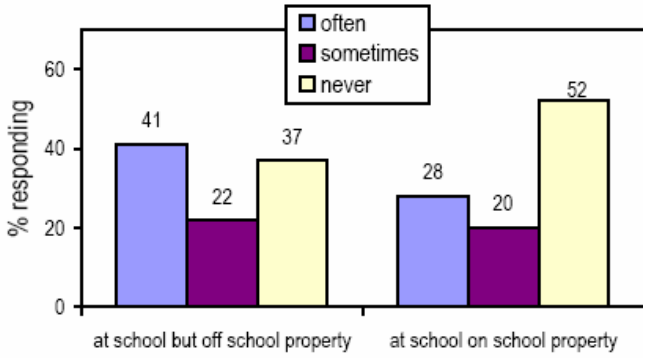
Smoking often occurs in social situations among peers. Programs that help students to develop skills for resisting social influences are helpful. The most successful programs teach students refusal skills through direct instruction, modeling, rehearsal, and reinforcement. It is also important to increase awareness of the artificial atmosphere created in our society that leads students to see the cigarette as a rite of passage into adulthood and an emblem for rebellion.

Students who smoke were also asked several specific questions about smoking while at school. As has been noted, 37% of smokers report that they often smoke during the school day.

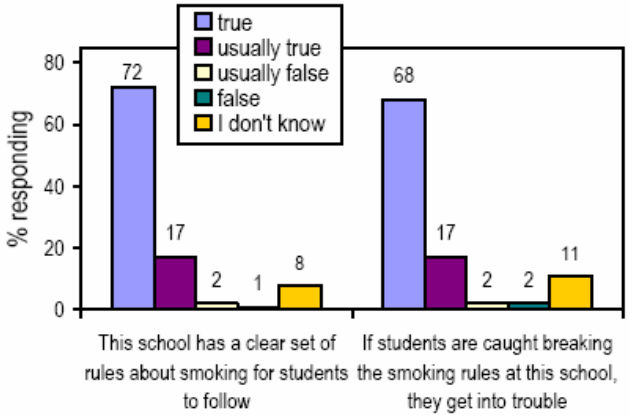
Many students smoke while "at school," however most leave school property to do so. This is likely a result of the provincial government's smoking ban on school property. Still, 48% of smokers reported that they often or sometimes smoke on school property. Additionally, 92% of all students said that the statement, "*I often see students smoking near this school,*" is true or usually true.

All students were asked about their perceptions of school rules on smoking and their enforcement. Fifty-five percent of all students responded 'a lot' or 'some' to the question, "*How many students at this school smoke where they are not allowed to?*" As the graph on the right shows, most students reported that the school has a clear set of rules about smoking, and that students caught breaking the rules face consequences.

Smoking During School



Awareness of Smoking Policies



Should We Take Action?

The enforcement and perceptions of enforcement are crucial to the success of school smoking bans. A recent study found that school smoking bans that were strictly enforced were related to an 11% decrease in the uptake of smoking.[16] To obtain this type of a reduction, it is important that students perceive that most or all students obey the rule. It is important for students to understand that the rule is not arbitrary, but intended to protect the health of students.

How AnyPlace Students Obtain Cigarettes

Most of the students at AnyPlace are under the age of 19. Despite the fact that provincial law prohibits the sale of cigarettes to anyone under the age of 19, many students are able to obtain cigarettes and in most cases they are not asked their age. Thirty-six percent of smokers stated that in the past month they were not asked their age when buying cigarettes, another 27% were asked less than half the time. Only 9% were always or almost always asked their age when buying cigarettes.

Students who smoke obtain their cigarettes in the following ways:

How do you usually get your cigarettes?	% responding
Buy them	29
Friends	31
Someone else buys them	37
Home	3

If you buy your own cigarettes, where do you buy them?	% responding*
Convenience store	86
Gas station	76
Grocery store	28
Bar	38
Restaurant	21
Friend or other person	24

* Note: column may exceed 100% as students were asked to select ALL that apply.

Should We Take Action?

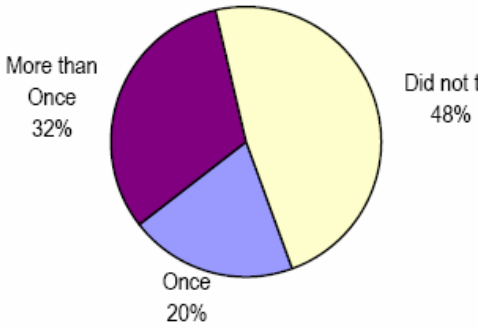
Partnerships between schools and local health departments are important in making a difference in reducing the number of vendors who sell to minors. Working with local businesses to increase compliance with laws that prohibit sales to minors can be an effective way to reduce youth access to tobacco products. Consider offering incentives (such as recognition in a local newspaper) to stores that refuse to sell tobacco products to minors or cracking down on those stores that do.

Trying to Quit at AnyPlace

Quitting smoking is not an easy process for adults or for youth. New evidence indicates that the first symptoms of addiction to nicotine may occur as early as a few days or weeks after the beginning of even occasional smoking by youth.[17] Students can have a very difficult time quitting even when they are strongly motivated to do so.

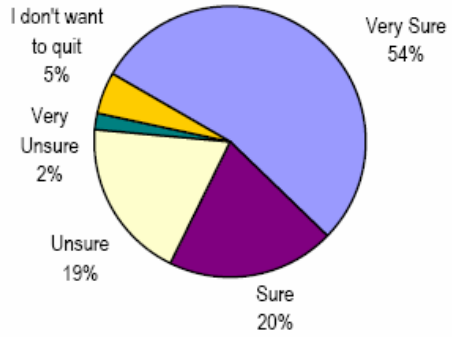
Many smokers make several quit attempts before successfully maintaining a long-term smoke free lifestyle. When daily smokers at your school were asked, "*How many times in the past year have you tried to quit smoking,*" the majority (52%) reported one or more quit attempts.

Quit Attempts in the Past Year



Students were asked how sure they were that they could quit smoking. Despite the large proportion of students who feel they could quit smoking if they wanted to, many students do not have a clear quit date in mind. When students were asked about their plans to quit smoking, the majority of students - 80% of females and 55% of males - plan to quit, but are not sure when. Another 10% of females and 28% of males plan to quit within a week to a year. Ten percent of females and 17% of males have no plans to quit.

How Sure Students Are that They Could Quit



Students were asked if there was help available at their school for those who wish to quit smoking. Eighteen percent said help is available, 15% said that there is no help available and 67% were not sure.

When students were asked if they would join a quit smoking program if one were offered at the school, 7% of smokers said that they would.

The desire to quit seems to come earlier now than before, even prior to the end of high school. In fact it often seems to take hold as soon as the recent starter admits to himself that he is hooked on smoking. However, the desire to quit, and actually carrying it out are two quite different things, as the would be quitter soon learns.
Source: Kwehansky Marketing Research, Project 16, for Imperial Tobacco Ltd (Canada), October 1977.

Students who smoke were asked, *"If you were thinking about quitting smoking, rate whether you might use the following ways to quit."* Most student smokers (75%) said they would definitely try to quit on their own, but were willing to try a variety of other options. These other options may be especially important for youth who have not succeeded in previous quit attempts on their own. After quitting on their own, assistance from their doctor and friends were also popular options to help them quit smoking.

If you were thinking about quitting smoking, rate whether you might use the following ways to quit	% of Students Responding		
	Definitely	Maybe	Never
Self-help booklet	3	18	79
Group meetings at school	3	13	84
Doctor	11	29	60
Chat room on the Internet	4	9	87
Information site on the Internet	3	24	73
Teacher, guidance counselor, or school nurse	6	24	70
Free telephone quit line	3	14	83
Friends advice	31	43	26
Quit on my own	75	20	5

Should We Take Action?

Cessation services are an important aspect of a comprehensive approach to tobacco control. If AnyPlace provides such services, consideration should be given to promoting them. If there currently are no services in place, implementing a program would be of great benefit to the many students at AnyPlace who would like to quit smoking but find it difficult to do so. The Resource List that is appended to this report suggests several good cessation programs that can be implemented by the school alone or in conjunction with the local public health department.

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Appendix C – Methods for Developing of Information Systems

Method	Description	Strengths	Limitations	Stage of Application
Reflective dialogue **(Scholes & Freeman, 1994)**	- participants respond reflexively to an issue and are then encouraged to reflect on the sources underlying their knowledge/competence/skill through direct probing - applied throughout a focused interview to elicit data over a period of time	- enables user to articulate areas of knowledge not immediately accessible - allows user to reframe elements identified back to the whole or big picture	- direct probing may result in a distorted representation of elicited information - time-consuming (applied with the same participants over multiple interviews)	Needs assessment & User analysis System requirements
Critical Incident Questionnaire **(Olvingson, Hallberg, Timpka & Greenes, 2002)**	- questionnaire developed by: (1) making changing terminology on an existing health service questionnaire; (2) performing a heuristic evaluation through iterative discussions with experts; (3) pilot testing (n=35) - closed and open -ended questions - 5 sections: personal data, educational background, professional background, problems experienced in practice, and sources of information	- allows developers to examine activities potential users engage in daily - allows the inclusion of many participants in the development process - open-ended questions provide added depth to responses (compared to closed questions)	- doesn't allow for validation of results - limits the depth of information that can be obtained	Needs assessment & User analysis
Concept Mapping **(Zaff, et al., 1993)**	- involves producing a concept map of the domain experts' knowledge during an audio-taped interview with the expert - a concept map is a graphical representation of concepts assigned labels and linked to one another - linkages also labeled according to the relationship existing between concepts - key concepts on each map are used to create a summary map for multiple users	- captures domain experts' understanding of the problem - helps organize domain knowledge - serves as a communication medium - allows participants to elaborate while keeping track of the original idea	- requires 3-5 interviewers - may not be suitable for complex problems (may become too cluttered to be useful)	Needs assessment

Group Elicitation Method **(Boy, 1997)**	- combines a brainstorming technique with a decision-support system - involves 6 phases; takes 4-8 hours Phase 1 – formulation of issue statements and selection of participants Phase 2 – generation of viewpoints (brainwriting technique) Phase 3 – reformulation of viewpoints into more elaborate concepts (classifying viewpoints into concepts, merging, creating, and subdividing concepts) Phase 4 – generation of relationships between concepts & ranking priorities Phase 5 – derive consensus using computer program (mean priority, inter-participant consistency, mean priority deviation, global consensus) Phase 6 – critical analysis of the results	- allows generation, cross-referencing, and refinement of several issues - consensus ratings can be used to guide development - cooperative aspect is valued by participants	- during brainwriting activity, problems may arise understanding people's handwriting and interpreting arguments - requires that all relevant stakeholders be present in the activity (converging these individuals may be difficult)	System requirements
Voice of Customer Table (VCT) **(Hallberg, et al., 1999)**	- 8-column table with the following headings: The VoCs, Who asked for it, What do they want to do with it, When do they want to do it, Where would they like to use it, Why would they use it, and How would they use it, Customer need. - useful for gaining in-depth understanding of identified user needs	- useful in transforming a user statements (i.e., needs, problems, technical solutions) into user needs - helps bridge language gaps between system developers and users - useful for validating and prioritizing user needs	- time consuming as it requires meeting with potential users— preparing VCT in advance by filling it in as far as possible and distributing to all participants reduces this impact of this limitation	System requirements
Repertory grid **(Scholes & Freeman, 1994)**	- 3 stages: (1) identify key elements of users' view of situations; (2) create a set of constructs describing identified elements. Elements and constructs are entered into a matrix. (3) participants score elements in terms of priority	- concrete, visual representation of issues - helps identify priority issues by ranking elements	- fails to capture the nature of relationships between elements	System requirements

Use Case Maps **(Olvingson, Hallberg, Timpka & Lindqvist, 2002)**	- highlights component interactions - involves creating maps providing a general overview of the system and its functionality, omitting details - triggering causes/ preconditions are linked to resulting effects through paths that describe causal relationships between tasks or functions performed	- provides a simple overview of the system components/functionality - provides a foundation upon which to build future discussions between system users and developers	- time-consuming (study reports this limitation due to the use of non-optimal drawing tool)	System requirements
Set diagrams **(Al-Karaghouli, AlShawi, & Fitzgerald 2000)**	- graphical representation of knowledge and understanding gaps between system developers and potential end users - Venn diagrams represent the different areas of knowledge and understanding from two parties, overlapping at areas of mutual knowledge and understanding - mapping involves matching developer specifications with user requirements	- highlights areas of misunderstanding that require further discussion and clarification - iterative process—continues until all elements are matched or removed	- unstructured, arbitrary starting points - only illustrates degrees of mismatch between parties; further techniques must be applied to address mismatch	System specifications
IDEF-0 **(Zaff, et al., 1993)**	- modeling technique to represent hierarchically-structured knowledge - each function of the system is depicted as a box within a hierarchical overview - arrows in the right side of the box represent outputs (product of the activity) - arrows in the left side represent inputs (what is used/transformed by the activity) - arrows at the top represent controls (things that constrain/control activities) - arrows at the bottom represent mechanisms (mechanisms/resources used by the system to accomplish an activity)	- provides a useful overview of the system - provides a medium for communication between system developers and domain experts	- reports incompatibility with the way domain experts (users) understood their domain - domain experts' responses may be constrained by the structure of the representation	System specifications
Paper prototypes Johnson, 2005	- involves re-creating system screens on paper (1 paper = 1 screen) - allows 'navigation' through the system	- low-cost - quick - easy to apply changes	- may be difficult to visualize for users	Prototype Interfaces

Appendix D – Phase I Participant Recruitment Email

Date

Dear Participant:

My name is Rosanna Morales and I am an MSc Candidate in the Department of Health Studies and Gerontology at the University of Waterloo. I am currently conducting my Masters thesis under the supervision of Drs. Steve Manske and Jose Arocha also from the University of Waterloo.

This email invites you to complete a 20-minute web survey that will contribute to the design of a web tool that supports youth tobacco control. You have been identified as a potential end-user of this system. As such, your input into the early stages of development will be critical to developing a useful tool.

Attached to this email you will find the following materials:

a) An information letter describing this research study in detail.
b) A copy of the SHAPES (School Health Action Planning and Evaluation System), Smoking Behavior Questionnaire.
c) A sample computer-generated feedback report (using fictitious data) that is generated based on data collected through the SHAPES, Smoking Behavior Questionnaire.
d) A link to an online questionnaire for the research study.

These materials are aimed at providing you with some background information regarding this research study.

If any part of this note is unclear or incomplete please do not hesitate to contact me or my supervisors. Our contact information is outlined in the attached information letter (name of attached file).

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. In the event you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext. 6005.

Thank you in advance for your consideration in participating.

Sincerely,

Rosanna Morales
MSc Candidate
Department of Health Studies & Gerontology
University of Waterloo

Appendix E - Phase I Information Letter

Date

Dear Participant:

You are being invited to participate in a study being conducted by Rosanna Morales as part of her Masters degree thesis requirement under the supervision of Drs. Jose Arocha and Steve Manske of the University of Waterloo. This study is designed to inform the development of a web tool to simplify access to and analysis of evidence for youth tobacco control. This system will support planning, evaluation and research related to youth tobacco control.

A newly developed system for local data collection and feedback, known as the School Health Action Planning and Evaluation System (SHAPES), has been administered in 595 schools (Grades 5-12) across Canada. The majority of data collected to date focus on smoking behaviours. The success of SHAPES has provided the opportunity to create a national database with data linked to geographic areas. This database will enable direct queries related to a variety of youth tobacco control efforts at local, provincial and national levels.

The SHAPES national database then serves as a foundation for a knowledge exchange system using modern information and communication technology. Such a system could enable a variety of activities, such as the ability to identify effective interventions across Canada and share experiences and materials with communities and/or schools with similar characteristics.

This request asks you to contribute to the development of this system. The study will examine the information needs and characteristics of potential end-users. As a potential end-user of the system, you are being asked to participate in this study by filling out a questionnaire. The questionnaire is designed to be completed through the Web (insert URL). Should this pose a problem, please contact Rosanna Morales (see below) to arrange another method of participation.

Here is an example of the type of question you may be asked when completing the online questionnaire: “What types of information would you find useful to support your work with respect to youth tobacco control (check all that apply from a list of options)?

We estimate completing the survey will require approximately 20 minutes. Through the questionnaire you will have an opportunity to express your interest in participating in a second phase of development (interview) by entering your email address. Participants expressing interest will be contacted at a later date to receive further details.

Your assistance in this study will help us create a useful web tool. There are also personal benefits for you as you will have the opportunity to influence the development of a novel system that has potential to advance the field of youth tobacco control. There are no known or anticipated risks to your participation in this study.

Data collected will be kept confidential. Further, your name will not appear in any report, publication or presentation resulting from this study. All information that can identify

participants, such as yourself, will be removed from the data to ensure confidentiality. The data will be kept for a period of 5 years and will be securely stored in a password protected computer in a locked office in the research laboratory. After 5 years, any paper records will be shredded and electronic records will be deleted.

Your participation in this study is completely voluntary, and you may withdraw from the study at any point without any consequences by simply not submitting responses. You may also decline to answer particular questions if you wish.

If any part of this letter is unclear, or you would like additional information to assist you in reaching a decision about participation, please contact me or my supervisors. Our contact information is provided below.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. In the event you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext. 6005.

Thank you for your assistance with this research project.

Sincerely,

Rosanna Morales
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Appendix F – Phase I Web-Based Questionnaire

First Screen

[University of Waterloo Logo]

Thank you for agreeing to provide us with your input into the design of a web tool to simplify access to and analysis of evidence for youth tobacco control. This system will support planning, evaluation and research related to youth tobacco control. As a potential end-user of the tool, your input early in this process is valuable and will help shape the tool's development.

You will be asked to respond to a series of questions by clicking on the appropriate response box. If you choose to do so, you can withdraw from participation in the questionnaire at any time. Please be assured that all of your responses will be kept completely confidential and access to your data is password protected. Participation in this survey should take approximately 20 minutes.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. In the event you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext. 6005.

Please click on the Go Button below to proceed to the questionnaire.

[GO]

[START SURVEY – ONE QUESTION PER SCREEN]

Section I: User Characteristics

1. We recognize that people perform multiple roles. Which of the following *best* describes your primary work currently?
    a. Research
    b. Health
    c. Education (i.e., Elementary or Secondary School)

2. (if answered "Health" to Q1) Which of the following best describes the scope of your decision-making role, as it applies to tobacco control?
    a. Local (e.g., schools, regions, public health units)
    b. Provincial
    c. National
    d. Other

3. In what region of Canada do you work?
    a. West (B.C., Alberta, Saskatchewan, Manitoba)
    b. Central (Ontario, Quebec)
    c. East (Nova Scotia, Newfoundland, P.E.I., New Brunswick)

4. What is the highest level of formal education that you have received?
    a. High school diploma
    b. College diploma
    c. Bachelor degree
    d. Masters degree
    e. Doctoral degree
    f. Other

5. Do you have easy access to the internet to support your work?
    a. Yes
    b. No

6. How would you rate your ability to perform the following tasks?

	Excellent	**Very Good**	**Good**	**Poor**
Finding information on the Internet				
Performing common computer tasks (e.g., word processing, email)				
Conducting data analyses using spreadsheets (e.g., Microsoft Excel)				
Conducting data analyses using statistical software (e.g., SAS, SPSS)				
Using computer mapping tools (e.g., MapQuest or Google Maps)				
Using a set of data to answer questions				
Finding analyzed data (e.g.,, in reports) to answer questions				

Section II: Current Practices

7. How frequently do you use the following sources of information to support your work?

Source	Daily	Weekly	Monthly	Rarely /never
Media (newspapers, magazines, newsletters)				
Local government groups (e.g., Local public health department)				
Provincial or national government groups (e.g., Health Canada, Canadian Institute for Health Information, Ministry of Health Promotion)				
Non-governmental, voluntary organizations (e.g., Heart & Stroke Foundation, Canadian Cancer Society)				
Lay sources (e.g., colleagues, unaffiliated websites, unpublished/"grey" literature)				
Scientific literature (e.g., journals)				
Other (please specify):				

8. How would you rate the quality (i.e., reliability, relevance, and currency) of these sources, as it relates to your work?

Source	Reliability			Relevance			Currency		
	E*	G*	P*	E	G	P	E	G	P
Media (newspapers, magazines, newsletters)									
Local government group (e.g., Local public health department)									
Provincial or national government group (e.g., Health Canada, Canadian Institute for Health Information, Ontario Ministry of Health Promotion)									
Non-governmental, voluntary organizations (e.g., Heart & Stroke Foundation, Canadian Cancer Society)									
Lay sources (e.g., colleagues, unaffiliated websites, unpublished/"grey" literature)									
Scientific literature (e.g., journals)									
Other (please specify)									

* E = excellent; G = good; P = poor (these titles will appear on the web survey – abbreviated only so the table fits on the page)

9. Have you experienced any problems with the information **sources** you use now? (e.g.,, overly detailed information/lack of detail; information is sent out too frequently/not frequently enough)
   Freeform Answer

10. What are your goals in seeking out information? Check all that apply, and then rank each goal you checked according to your priorities, where 1 indicates your highest priority.

Goal	Apply	Rank
Evaluating programs or interventions to determine effectiveness		
Evaluating programs or interventions to make funding decisions		
Finding information to identify priorities for new programs		
Conducting academic research		
Reporting to management or government		
Finding information to create materials for programs (e.g., informational pamphlets or brochures)		
Addressing parental concerns		
Responding to media queries		
Getting information for personal interest/curiosity		
Other (please specify):		

11. On average, how many hours per week do you spend finding, using, and/or analyzing data?
    a. None (if none, proceed to Q14)
    b. Less than 1 hour
    c. 1-5 hours
    d. 6-10 hours
    e. More than 10 hours

12. What data analysis tools do you currently use? Check all that apply, and then rank each tool you checked according to how frequently you use it, where 1 indicates the tool you use most frequently.

Data Analysis Tool	Apply	Rank
SAS		
Stata		
Epi Info		
SPSS		
Spreadsheet program (e.g., Microsoft Excel)		
Database program (e.g., Microsoft Access)		
Other (please specify):		

13. Have you experienced any problems with the **data analysis** tools you use now? (e.g., Interface is too complex/overly simplified; user is given too much/too little control when performing data analysis; tool is inconsistent with user's goals or abilities)
Freeform answer

Section III: Information Needs

14. What types of information or data would you find useful to support your work with respect to youth tobacco control?

Type of information or data	Very useful	Somewhat useful	Not useful
Anecdotal data (e.g., stories of effective interventions shared by schools or communities)			
Local smoking data (e.g., smoking rates of local schools)			
Provincial smoking data (e.g., by province, how are students accessing tobacco products)			
National smoking data (e.g., schools/areas that are national leaders with respect to smoking rates)			
Results of program evaluations			
Reports of smoking profiles of schools or communities			
Intervention information from health professionals			
Other (please specify):			

15. How would you like to be able to use the information or data made available? Check all that apply, and then rank each item you checked according to your priorities, where 1 indicates your highest priority.

Use	Apply	Rank
Access material for presentations or speeches		
Perform secondary data analyses		
Match schools based on smoking profile characteristics		
Identify potential targets for interventions (e.g., schools with high smoking rates)		
Identify and share effective interventions		
Track progress of schools, regions, or provinces over time		
Create materials to engage students in school projects or assignments		
Comparing smoking data across jurisdictions or demographic profiles		
Other (please specify):		

16. How would you like to analyze data made available?

Analysis Type	Strong interest	Some interest	No interest	Don't know
Create pie charts, histograms				
Calculate mean, median, mode, std. dev, min/max				
Use t tests, Z scores, correlation, causal correlations				
Analyze distributions, confidence intervals, p values				
Other (please specify):				

17. Do you have a process or system for **managing** data?
    a. Yes (if yes, proceed to Q18)
    b. No (if no, proceed to Q19)

18. Please describe your system and suggest ways it could be improved. (proceed to Q21)
    Freeform answer

19. Are you interested in managing data?
    a. Yes (if yes, proceed to Q20)
    b. No (if no, proceed to Q21)

20. What factors are preventing you from managing data?
    (e.g., Lack of appropriate software, lack of time or training)
    Freeform answer

21. Do you have a process or system for **creating reports or materials** (brochures, pamphlets, etc.) based on analyzed data?
    a. Yes (if yes, proceed to Q22)
    b. No (if no, proceed to Q23)

22. Please describe your system and suggest ways it could be improved. (route to last screen)
    Freeform answer

23. Are you interested in creating reports or materials (brochures, pamphlets, etc.) based on analyzed data?
    a. Yes (if yes, proceed to Q24)
    b. No (if no, proceed to end of survey)

24. What factors are preventing you from creating reports and/or materials (brochures, pamphlets, etc.) based on analyzed data?
    (e.g., Lack of access to data, lack of appropriate software, lack of time or training)
    Freeform answer

25. May we contact you to conduct a follow-up interview (the expected duration of the interview is 30-60 minutes)?
    a. Yes (Please enter email address _____)
    b. No

Final Screen

Thank you for your participation in this study. As a reminder, the purpose of this study was to begin the development of a web tool to simplify access to and analysis of evidence for youth tobacco control by examining the information needs and characteristics of potential end-users.

The questionnaires data will provide a better understanding of the needs and important characteristics of potential end-users, such as yourself. This information will serve to guide the development process to ensure that the system developed is consistent with user needs and provides value.

Please remember that any data about you as an individual participant will be kept strictly confidential. Once all the data are collected and analyzed for this project, I plan on sharing this information with the research community through seminars, conferences, presentations, and journal articles. When the results are compiled only group data will be presented/shared and individuals will not be identified. If you are interested in receiving more information about the results of this study, or if you have any questions or concerns, please contact me or my supervisors at the email addresses listed at the bottom of this screen. When the study is completed, I will send you a summary of the results upon request. If you have indicated interest in participating in the next stage of development (interview), you will be contacted at a later date and receive further details at that time.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. In the event you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext. 6005.

Sincerely,

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Appendix G – Phase II Participant Recruitment Email

Date

Dear Participant:

I would like to thank you for participating in the first phase of this study to inform the design of a web tool that supports youth tobacco control. Through the online questionnaire you completed, you indicated an interest in participating in the next phase of development. The next phase will involve briefly using a prototype web tool developed (available online) and providing feedback through a telephone interview.

Please find attached an information letter that details a phase 2 request. If you are still interested in participating upon reviewing the information letter, please contact me to set up a mutually convenient time to conduct an interview. I will call in about 7 days if I haven't heard from you. You will have the option of not continuing at that point.

Should you have any questions or concerns, please do not hesitate to contact me or my supervisors. Our contact information is outlined below.

Thank you in advance for your consideration in participating and I look forward to hearing from you.

Sincerely,

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Appendix H – Phase II Information Letter

Date

Dear Participant:

Thank you for participating in Phase 1 of a study to inform the design of a web tool that supports youth tobacco control. You are being invited to participate in the second phase of this study, being conducted by Rosanna Morales as part of her Masters degree thesis requirement under the supervision of Drs. Jose Arocha and Steve Manske of the University of Waterloo. Phase 2 extends our learning from Phase 1 about potentially useful functions of the web tool.

A newly developed system for local data collection and feedback, known as the School Health Action Planning and Evaluation System (SHAPES), has been administered in 595 schools (Grades 5-12) across Canada. The majority of data collected to date focus on smoking behaviours. The success of SHAPES has provided the opportunity to create a national database with data linked to geographic areas. This database will enable direct queries related to a variety of youth tobacco control efforts at local, provincial and national levels.

The SHAPES national database then serves as a foundation for a knowledge exchange system using modern information and communication technology. Such a system could enable a variety of activities, such as the ability to identify effective interventions across Canada and share experiences and materials with communities and/or schools with similar characteristics.

The first phase of this research, which you participated in, examined the information needs and characteristics of potential end-users. During this phase, you indicated interest in participating in the next stage of development. This second phase aims to gain a deeper understanding of user needs by asking you to do the following: (1) provide feedback about a prototype tool and (2) identify further useful functions of the web tool.

As a potential end-user of the system, you are being asked to: (1) visit this website (link will be provided prior to the interview) and use the prototype web tool; and (2) participate in a telephone interview to get your feedback about the prototype and discuss other useful functions of the web tool. With your permission, the interview will be tape-recorded to facilitate collection of information, and later transcribed for analysis. Shortly after the interview has been completed, I will contact you by telephone to give you an opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish.

Here is an example of the type of question you may be asked during this interview: “What functionality of the prototype web tool would you use most frequently?”

Your estimated total time commitment for participating in this phase of the study is approximately 75 minutes (15 minutes using the prototype web tool and 60 minutes for the telephone interview). Your assistance in this study will help inform further development of the web tool. As a participant, there are also personal benefits for you as you will receive first

notification (via email) when the system is operational. There are no known or anticipated risks to your participation in this study.

To ensure confidentiality, your name will not appear in any report, publication or presentation resulting from this study. However, with your permission anonymous quotations may be used. All information that can identify participants, such as yourself, will be removed from the data to ensure confidentiality. The data will be kept for a period of 5 years and will be securely stored in a locked cabinet in the research laboratory. After 5 years, paper records will be shredded and transcription tapes will be destroyed.

Your participation in this phase of the study is completely voluntary, and you may withdraw from the study at any point without any consequences by simply informing the researcher of your decision. You may also choose not to answer any questions you wish.

If any part of this letter is unclear, or you would like additional information to assist you in reaching a decision about participation, please contact me or my supervisors. Our contact information is provided below.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. In the event you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the office of Research Ethics at 519-888-4567, Ext. 6005.

Thank you for your assistance with this research project.

Sincerely,

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Appendix I – Phase II Consent Form

I have read the information presented in the information letter about a study being conducted by Rosanna Morales of the Department of Health Studies and Gerontology at the University of Waterloo. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted.

I am aware that I have the option of allowing my interview to be tape recorded to ensure an accurate recording of my responses.

I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. I was informed that if I have any comments or concerns resulting from my participation in this study, I may contact the Director, Office of Research Ethics at (519) 888-4567 ext. 6005.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

☐YES ☐NO

I agree to have my interview tape recorded.

☐YES ☐NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.

☐YES ☐NO

Participant Name: _____ (Please print)

Participant Signature: _____

Witness Name: _____ (Please print)

Witness Signature: _____

Date: _____

Appendix J – Phase II Interview Script

Prototype Feedback

Access Data

1. Is this function relevant or useful to you?
    a. If yes, how frequently would you use this function?
    b. If yes, how would you use these data?
    c. If no, why not?
2. What modifications, if any, would you make to this section of the tool?

Create Your Own Report

1. Is this function relevant or useful to you?
    a. If yes, how frequently would you use this function?
    b. If yes, how would you use these reports?
    c. If no, why not?
2. What modifications, if any, would you make to this section of the tool?

Ask a Question of the Data

1. Is this function relevant or useful to you?
    a. If yes, how frequently would you use this function?
    b. If yes, how would you use this function?
    c. If no, why not?
2. What modifications, if any, would you make to this section of the tool?

Information Sources (for each subsection)

1. Is this function relevant or useful to you?
    a. If yes, how frequently would you use this function?
    b. If yes, how would you use this function?
    c. If no, why not?
2. What modifications, if any, would you make to this section of the tool?

People Directory

1. Is this function relevant or useful to you?
    d. If yes, how frequently would you use this function?
    e. If yes, how would you use this function?
    f. If no, why not?
2. What modifications, if any, would you make to this section of the tool?
3. Would you voluntarily include your name in the directory?

Additional Questions

1. Which functions of the web tool do you anticipate using most frequently?
2. Which functions of the web tool do you anticipate using least frequently?
3. What additional functions would be useful to you?
4. Do you feel you should have access to any data?
    a. Why or why not?

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