

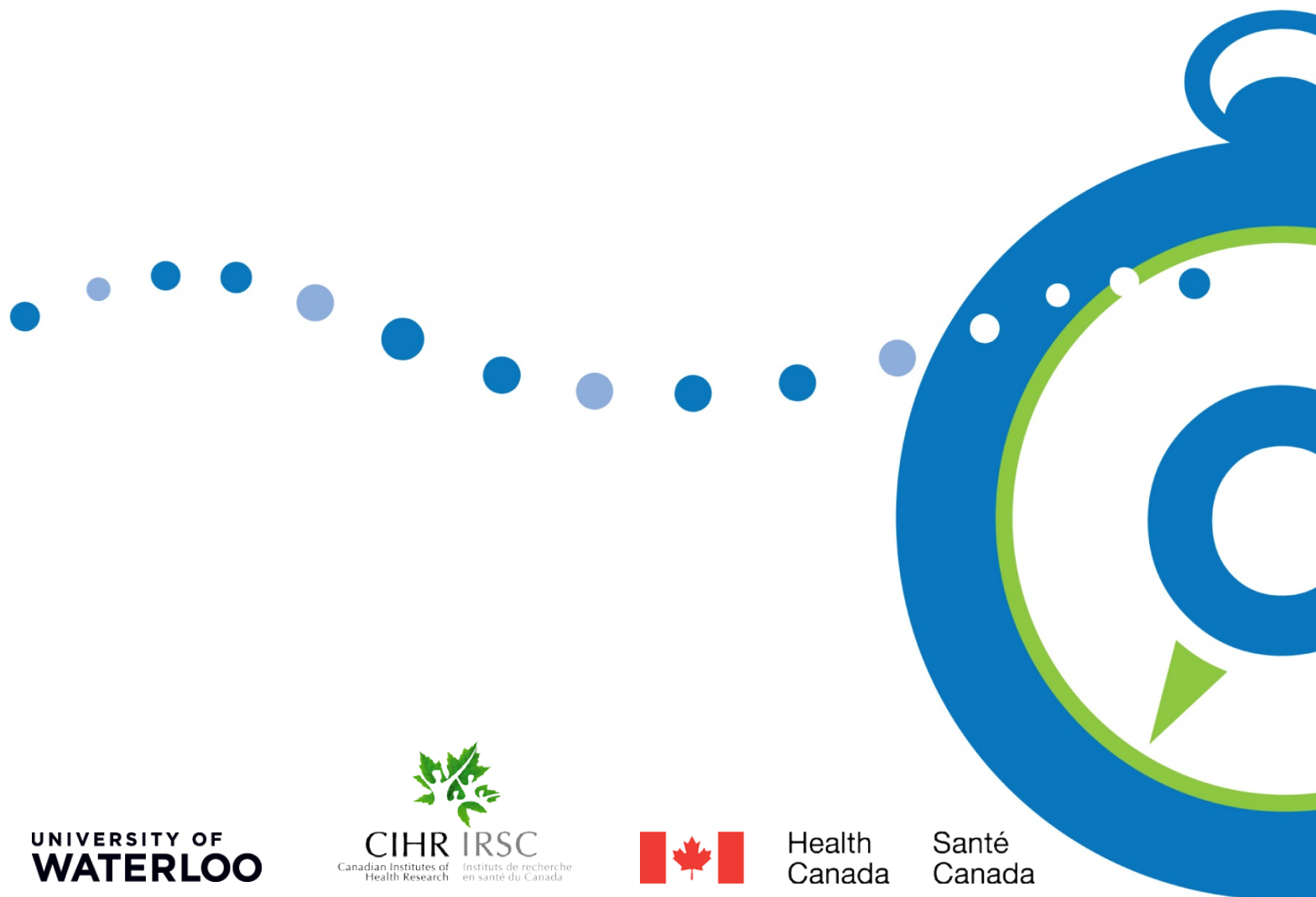


Cohort study evaluating how changes in school programs, policies, and resources impact youth health behaviours

COMPASS Knowledge Broker Procedures for Contacting and Working with Participating Schools: An Update

COMPASS Technical Report Series, Volume 6, Issue 2

August 2019



University of Waterloo

Waterloo, Ontario

August 2019

©COMPASS

www.compass.uwaterloo.ca

ACKNOWLEDGEMENTS

Kristin M. Brown, PhD¹
Alle Butler, MSc²
Kate Battista, MMath²
Julianne Vermeer, MPH²
Scott T. Leatherdale, PhD²

1 – Centre for Teaching Excellence, University of Waterloo, Waterloo, ON Canada.

2 - School of Public Health and Health Systems, University of Waterloo, Waterloo, ON Canada.

Report funded by:

The COMPASS study has been supported by a bridge grant from the CIHR Institute of Nutrition, Metabolism and Diabetes (INMD) through the “Obesity – Interventions to Prevent or Treat” priority funding awards (OOP-110788; awarded to SL), an operating grant from the CIHR Institute of Population and Public Health (IPPH) (MOP-114875; awarded to SL), a CIHR project grant (PJT-148562; awarded to SL), a CIHR bridge grant (PJT-149092; awarded to KP/SL), a CIHR project grant (PJT-159693; awarded to KP), and by a research funding arrangement with Health Canada (#1617-HQ-000012; contract awarded to SL).

Suggested citation:

Brown KM, Butler A, Battista K, Vermeer J, Leatherdale ST. *COMPASS Knowledge Broker Procedures for Contacting and Working with Participating Schools: An Update*: COMPASS Technical Report Series. 2019; 6(2). Waterloo, Ontario: University of Waterloo. Available at www.compass.uwaterloo.ca

Contact:

COMPASS Research Team
University of Waterloo
200 University Ave West, BMH 1038
Waterloo, ON Canada N2L 3G1
compass.uwaterloo.ca

Table of Contents

Acknowledgements.....	3
Introduction	5
Background/Purpose	5
School Health Profile.....	5
Knowledge Brokering in the COMPASS study.....	6
The Role of Knowledge Brokers	6
Provincial Models of Knowledge Brokering.....	6
Skills and Traits of Effective Knowledge Brokers	7
Process of Knowledge Brokering: Ontario, Alberta, British Columbia Model	7
Knowledge Broker Preparation.....	7
Process for Contacting Schools.....	7
Conducting a Follow-up Interview and Discussing Plans for Health-related Changes	7
Record Keeping for Knowledge Brokering.....	9
Process of Knowledge Brokering: Quebec Model.....	9
Engagement in Knowledge Brokering.....	9
Impact of COMPASS Knowledge Exchange Activities	10
School Health Profile.....	10
Impact of Knowledge Brokering.....	11
Challenges of Knowledge Brokering	12
Conclusions	13
References	13

Introduction

COMPASS is a 9-year longitudinal study (starting in 2012-13) designed to follow a prospective cohort of grade 9 to 12 students attending a convenience sample of Canadian secondary schools over several years to understand how changes in school environment characteristics (policies, programs, built environment) and provincial, territorial, and national policies are associated with changes in youth health behaviours (1). COMPASS originated to provide school stakeholders with the evidence to guide and evaluate school-based interventions related to obesity, healthy eating, tobacco use, alcohol and cannabis use, physical activity, sedentary behaviour, school connectedness, bullying, and academic achievement. Based on feedback from participating schools as well as current issues among Canadian youth, COMPASS expanded its topic areas to include mental health, prescription drug use, and gambling. COMPASS has been designed to facilitate multiple large-scale school-based data collections and uses in-class whole-school sampling data collection methods consistent with previous research (2-5).

Additionally, COMPASS facilitates knowledge transfer and exchange by annually providing each participating school with a School Health Profile that highlights the prevalence for each health behaviour outcome among students at their schools, and provides comparisons to provincial/territorial and national norms or guidelines. As well, the School Health Profile offers evidence-based suggestions for school-based interventions (programs and/or policies) designed to address the outcomes that are included within the profile (refer to: www.compass.uwaterloo.ca). Schools are then connected with a COMPASS knowledge broker, who helps schools understand their findings and supports them in taking action to improve student health across different domains of interest.

The purpose of this technical report is to provide an updated overview of COMPASS knowledge brokering, expanding upon the 2015 Technical Report on Knowledge Broker Procedures (6).

Background/Purpose

The 2015 COMPASS Technical Report on Knowledge Broker Procedures (6) described the procedures used in the first few years of the COMPASS study. Since then, an evaluation of COMPASS knowledge exchange activities has been conducted (7-9) and two additional provinces have joined the study, each with their own knowledge brokering approaches. Hence, this technical report will provide an update to reflect the current COMPASS knowledge brokering activities.

The purpose of the COMPASS knowledge translation and exchange (KTE) approach (i.e., the provision of a School Health Profile and knowledge brokering) is to provide each school with a summary of its survey findings, and support school prevention efforts to enhance student health. The idea is that by providing schools with tailored evidence and support, they will be able to make changes to their practice (10). Further, by building relationships between researchers and schools, schools are more likely to apply this evidence (11). Since knowledge exchange initiatives are just emerging in school health research, the COMPASS study provides an opportunity to learn best practices for these strategies in schools.

School Health Profile

For each participating year, schools receive a School Health Profile (SHP) 8-10 weeks following their data collection day that provides a tailored summary of their students' health behaviours based on COMPASS student survey data. Additionally, the SHP includes recommended changes a school can implement to improve student health, as well as contact information for the local public health unit and a COMPASS knowledge broker. Detailed information and a sample of the SHP have been published elsewhere (12).

Knowledge Brokering in the COMPASS study

The Role of Knowledge Brokers

Each participating COMPASS school is assigned a knowledge broker (KB). KBs are members of the COMPASS research team and have experience in research, public health and/or education. Contact information for the school's KB is included in the school-specific SHP. The KBs primary role is to support schools in understanding their individualized findings and identifying priorities for improving student health in their school. A secondary role of the KB is to facilitate interactions between the COMPASS research team, the school, and community partners (e.g., public health units), with the goal of promoting student health and wellbeing within the school.

Each year, the KB discusses the school's summary and provides ongoing support as needed (e.g., identifying health priorities within the school, potential funding opportunities, and connecting them to community agencies such as public health units). While a KB contacts each school annually, the schools decide whether they engage in knowledge brokering¹.

Provincial Models of Knowledge Brokering

The knowledge brokering process for Ontario schools in the COMPASS study was described in the 2015 COMPASS Technical Report on Knowledge Broker Procedures (6). However, some changes have been made over the course of the study, so this section will provide an updated description of the Ontario model in addition to those used in the other participating provinces. In Year 5 of the study (Y5; 2016-2017), COMPASS received a two-year Health Canada grant to further expand the jurisdictions participating. This new Health Canada funding was used to recruit schools in British Columbia (BC), Quebec, and Nunavut² for two years of COMPASS data collections.

- In **Ontario**, a team of staff and graduate students act as KBs for participating schools. Every year, each school is assigned a specific individual who is their KB, and when possible, this individual will continue to be the school's KB in subsequent years. Where possible, the KBs will be present for their schools' data collection to build rapport with the school contacts. Further, in school boards where all schools participate in the study, the same KB is assigned to all schools within that school board.
- In both **Alberta and BC**, the Research Coordinator (who is in charge of other study aspects such as recruitment, data collection, and ongoing communication with schools) also acts as the KB. Hence, one individual serves as the KB to all participating schools in their province.
- **Quebec** uses a different knowledge brokering model, which is mandatory for participating schools. As a result of buy-in from both the Quebec Ministries of Health and Education to the COMPASS study, meetings between the COMPASS research team, school boards, and provincial government staff have been possible. Hence, COMPASS knowledge brokering in Quebec consists of the COMPASS research team, school board leadership, and staff from the Quebec Ministries of Health and Education meeting to discuss school board-specific findings. Given the increase in participating schools in Quebec between year 5 (2016-2017) and year 6 (2017-2018), all schools from one specific school board are invited to the same meeting (see (13) for sample). At this

¹ The exception is Quebec, in which participation in knowledge brokering is mandatory.

² Nunavut did not participate in knowledge brokering or KTE activities.

meeting, school board-specific data are presented, discussed, and contextualized by the research team. Further support related to data analysis and planning and implementing evidence-based practice changes is also offered.

Skills and Traits of Effective Knowledge Brokers

Interviews with members of the COMPASS research team in 2016 (14) identified the following skills, knowledge, and traits as key tools for effective knowledge brokering:

- Transferable skills (i.e., effective communication, relationship building, and organizational skills)
- Knowledge of the school environment and a whole school approach, available resources and support agencies, and the COMPASS survey and data
- Personality traits (i.e., personable and approachable, patient, proactive, and independent)
- Research skills (e.g., conducting literature reviews and data analysis)

One of the facilitating factors to knowledge brokering identified by school and public health stakeholders and COMPASS researchers was the consistency in the KB assigned to the school each year (7). Since the interviews were conducted, in Ontario, the COMPASS team has made a concerted effort to maintain consistency in KBs assigned to schools. Additionally, some KBs have been assigned to schools based on their area of health behaviour expertise.

Process of Knowledge Brokering: Ontario, Alberta, British Columbia Model

Knowledge Broker Preparation

Interviews with members of the COMPASS research team in 2016 (14) indicated that training for the KB role was mostly informal such as other KBs sharing resources with them and familiarizing themselves with where to record information from KB calls. KBs discussed “learning as they went” and indicated they would value further training. As a result of these findings, the COMPASS team has increased the frequency of KB meetings and the provision of KB resources. In 2018, COMPASS Ontario KBs attended a workshop led by a knowledge brokering expert at the Gambling Research Exchange Ontario. During this workshop, KBs learned about new KTE approaches, activities, and available resources, and were able to explore possible solutions to KB barriers that were identified, specific to the COMPASS Study.

Process for Contacting Schools

Once the SHP is sent out, the KB is notified. The KB then follows up with the school contact via email within 1-2 weeks to arrange a follow-up call to discuss the school’s results. The KB process for contacting Ontario schools is detailed in the 2015 COMPASS Technical Report on Knowledge Broker Procedures (6).

Conducting a Follow-up Interview and Discussing Plans for Health-related Changes

The purpose of the follow-up call between the KB and the school is three-fold: 1) to check in with the school regarding the findings summarized in their SHP and identify health behaviours of concern, 2) to follow-up on, and fill in missing responses to, the school-level questionnaire (School Policies and Practices questionnaire), and 3) to discuss future plans for school health programming, answer questions, and connect to further resources (see Table 1 for a list of recommendations).

Additionally, KBs can provide supplementary school-specific data not included in the SHP summary upon request during follow-up interviews. This additional analysis is typically to inform school priority areas and has previously been used to inform schools' grant applications for school health funding. For more information regarding the follow-up interview, see the 2015 COMPASS Technical Report on Knowledge Broker Procedures (6).

Table 1. Transcribed recommendations made to schools by KBs during interviews and follow-up

Health Domain	KB recommendation/suggestion
Healthy Eating	• Improve availability and accessibility of breakfast program (i.e., program available 5 days a week instead of 3, promoted to all students, allow students to participate after class has begun) • Consider a student-run cafeteria at the school • Initiate a school garden, where schools can incorporate food into cafeterias or student cooking classes
Substance Use	• Implement the keepin' it REAL program: a program that provides teens with ways to stay away from drugs. The acronym 'REAL' represents four ways that adolescents resist drug offers –Refuse, Explain, Avoid, and Leave, which is the central theme of this curriculum. • Provide students with the opportunity to interact with police (ie. Presentations by law enforcement)
Bullying	• Implement the Fourth R program, which is an evidence-based program that is built in to the high school curriculum as a means to reduce risk behaviours such as violence/bullying, unsafe sexual behaviour and substance use
Physical Activity/Sedentary Behaviour	• Offer intramurals that are structure for, and targeted towards female students in an effort to increase female physical activity levels • Implement activity breaks in the classroom • Consider setting up school/classroom challenges using fitness/nutrition apps (i.e. MyFitnessPal)
Body Image	• Implement a program called "the Body Project" which is a well researched cognitive dissonance peer-led group for improving body image • Other programs and resources that were suggested that focus on body image include "Healthy Bodies curriculum" and "NEDA Toolkit for Educators"

Mental Health	Provision of a list of helpful resources including PHE Canada's "Mind Your Mind"; Ophea's "Level up"; and School Mental Health ASSIST resources
Gambling	Provided information about the YMCA's Youth Gambling Awareness Program
General	- Share data with students by using COMPASS data in classroom assignments and allowing student council to access data for use in planning - Use COMPASS data in grant applications

Record Keeping for Knowledge Brokering

One of the challenges identified during interviews with members of the COMPASS research team in 2016 was consistency in record keeping between KBs (7). As a result, KB record keeping has improved; COMPASS now tracks how data are being used by each school, additional data requests, as well as the number of KB follow-ups (KB introduction emails, replies to introduction emails, KB interviews conducted and the number of schools that provided permission to share their data) within a KB communication spreadsheet. Analysis of KB record keeping has since been conducted and is highlighted below.

Process of Knowledge Brokering: Quebec Model

The Quebec model for knowledge brokering has been found to be the most effective approach to KTE within the COMPASS study and varies from the model used in Ontario, British Columbia and Alberta, as all participating Quebec schools are mandated to participate in KB and KTE activities. Support from the Ministry of Health in Quebec has allowed COMPASS Quebec to collect census data from a number of school boards. For each school interested in participating in the study, a recruitment meeting involving a public health representative, the COMPASS PI and researchers, and members from the interested school (i.e., school administrator, principal, or school health team) is organized to provide more information about the study and the data collection process. Given the high participation rates within Quebec, a COMPASS researcher will lead one meeting for each participating school board where attendants include school-level representatives (e.g., psychologist, social worker, nurse, principal), school board representatives and administrators, and public health experts. The objective for each meeting is to deliver the SHP to each school and school board, and present, review and discuss results within the profiles. During this meeting, schools are offered additional resources including further data analysis and mining of student-level data by COMPASS researchers, as well as immediate support from the attending public health professional, in the planning, development of implementation of tailored evidence-based actions based on the identified needs for each school.

Engagement in Knowledge Brokering

The COMPASS team has tracked the number of KB interactions for each school beginning in their initial year of participation. The table below summarizes school engagement in knowledge brokering for the 2017-18 data collection year of which there is complete data available.

Table 2. Number and type of knowledge broker interactions for each provincial jurisdiction participating in the COMPASS study (2017-2018)

	Ontario	Alberta	British Columbia	Nunavut	Quebec
Total # of Schools participating in COMPASS	61	8	16	2	37
# of KB introduction emails sent to schools	57	8	16	2	N/A
# of schools that replied to general introduction emails	25	5	16	0	N/A
# of KB interviews conducted	14	0	13	0	12 meetings with school boards and private schools
# of schools that gave permission to share data	32 (no responses from remaining schools)	3 (1 refusal, no responses from remaining schools)	8 (no responses from remaining schools)	0 (no responses)	37 schools gave permission to share with their PHUs

Impact of COMPASS Knowledge Exchange Activities

COMPASS data are used to inform school KTE reports and KB recommendations. Moreover, these data have generated evidence on effective practices related to tobacco and e-cigarettes (e.g., progressive punishment for smoking on school property), sleep (e.g., delayed school start times), sedentary behaviour (e.g., intramural provision to reduce screen time), physical activity (e.g., access to indoor PA areas during non-instructional time, change room privacy curtains), and diet (e.g., closed campus lunch policies, breakfast program availability).

School Health Profile

Interviews with COMPASS researchers, school staff, and public health staff revealed the impact of providing schools with school-specific data. School and public health participants have found their

school-specific findings valuable and indicated the findings informed their programming and planning (9). They specifically value the year-to-year comparison of student health behaviours, the gender comparison of student health behaviours, and recommended interventions that are included in the SHP (9). School-specific findings have been used by schools and public health units in planning documents and grant applications, and shared with several school and community stakeholders (9). Further outcomes of schools and public health staff receiving school-specific findings include: programming changes, identifying health priorities to address, an enhanced school climate and culture, health promotion and communication initiatives, and working with the public health unit (9).

Subsequently, in 2016-2017, COMPASS sent a survey to participating schools to gain a sense of how they were using the data. The 37 responding schools reported sharing or planning to share data with the following groups: school administration (i.e., principals and VPs), teachers, school (parent) council, students, public health units, school board, parents, and the wider community. They planned to use data to assess needs/challenges to better target programming aimed at improving youth health, to inform school improvement plans, integrate into curriculum, and apply for health-related grants. Hence, the value of providing school-specific findings to schools participating in longitudinal research studies is evident.

Using the School Health Profile, schools are able to assess specific health priority areas for their student population, and demonstrate why this behaviour may be problematic (i.e., high proportion of their students partaking in a specific risky behaviour or students have demonstrated an increased uptake of risky behaviour over time). Previously, COMPASS data have been helpful in obtaining grants as well, these data have been used to assist schools in selecting the most appropriate grant for their school; 21 schools in 2016-2017 and 16 schools in 2017-2018 indicated that COMPASS data were helpful in selecting and obtaining grants.

Impact of Knowledge Brokering

Interviews with COMPASS researchers, school staff, and public health staff revealed the impact of connecting researchers and school stakeholders throughout the knowledge brokering process. A quantitative analysis of COMPASS data showed knowledge brokering participation was significantly associated with school-level changes in health eating, physical activity, and tobacco programming (8). Schools that participated in knowledge brokering were more likely to make healthy eating policy and practice changes, as well as physical activity and tobacco changes in the following year (measured in the School Policies and Practices Questionnaire). Interviews with COMPASS researchers and knowledge users (i.e., school and public health staff) also uncovered impacts for both groups.

Outcomes for **knowledge users** included:

- Additional resources to inform school- and board-level planning and improve comprehensive school health
- Relationship building (between schools and public health units, schools and researchers, schools and health-based organizations)
- Added value beyond receiving school-specific data (e.g., motivation and support for next steps, access to additional data and analyses, clarification of findings, ideas for programming, and further opportunities); and,
- School-level changes (e.g., winning healthy school grants and awards, changes to school facilities programs and policies).

- o Schools have introduced new physical activity programs such as girls fitness classes (Zumba, Yoga), new dance clubs and female empowerment workshops
- o Schools have introduced daily physical activity into their curriculum
- o Schools have enhanced their outdoor education for students by building a greenhouse and using the food in cooking classes and other courses
- o COMPASS KBs ran a school-wide meeting where superintendent, public health nurse, and the school contact identified energy drink consumption as problematic among their student population; in response to this as well as additional analyses and resources shared by their KB, the school banned energy drinks from school campus and included the new policy in their student handbook
- o Several COMPASS schools participated in Ophea's Healthy Schools Certifications and/or were recipients of the Ophea School Community Award (nominated by a COMPASS KB); with the funding received from the School Community Award, one school created a community urban garden.
- o With the help of a KB, one COMPASS school implemented a specific policy to prevent student smoking, resulting in a 50% reduction of the current smokers at this school between 2012 and 2013 (15).

Outcomes for **researchers** included:

- Feedback that led to changes within the study;
- Engagement of schools and retaining schools in the longitudinal study; and,
- Enhanced understanding of the school environment, implementation and context of interventions.

Interestingly, the outcomes of COMPASS knowledge exchange (i.e., receiving school-specific findings and knowledge brokering) aligned with a framework (16) for implementing a health-promoting schools approach. Hence, knowledge exchange may provide a mechanism to help schools implement a whole-school approach to health, which has potential population-level impact (17).

Challenges of Knowledge Brokering

The knowledge brokering process has not been without challenges. Foremost, the COMPASS study has not received funding to support the KB and KTE activities outlined above, and provide these services within a restricted budget. While the overall objective of the study is to advance youth health, COMPASS believes it is critical to provide school and student champions, as well as respective public health units with customized data to facilitate improvements within the school that support youth health and wellbeing. Given this, COMPASS KBs are very limited in the amount of assistance they are able to offer schools and public health units in interpreting their results and exploring possible prevention and intervention initiatives.

As indicated by the low number of KB interviews conducted and low number of replies to emails (Table 2), KBs often find it challenging to communicate and engage with school administration to set up phone interviews. Further to that, recommendations provided by KBs are often not implemented due to lack of resources or personnel at the school level to carry out health initiatives. Moreover, if COMPASS was

provided with funds to fulfill more comprehensive KTE activities, these health initiatives or KB recommendations could be conducted by the KBs themselves.

Conclusions

This report provides an update to the 2015 Technical Report on Knowledge Broker Procedures (6). It expands upon the initial procedures documented, describes the various models used by the different provinces participating in the second phase of the study (2017-2021), and shares findings regarding the impact of knowledge exchange in the COMPASS study.

Since knowledge brokering remains a fairly new strategy in public health, and knowledge exchange initiatives are still emerging in school health research, it is important to document the COMPASS practices and also evaluate the outcomes of these initiatives. Knowledge exchange in COMPASS has shown the value of providing school-specific findings to schools, has led to school-level changes, and enhanced partnerships between researchers, schools, and public health units. However, funding to support knowledge exchange initiatives is necessary, as schools require additional resources to implement changes. A future area of growth includes examining how to engage schools that did not participate in knowledge brokering.

This report indicates the value of integrating knowledge exchange activities into longitudinal school health research studies; in some ways, participation in the COMPASS study could be considered an intervention. The impacts of the COMPASS study will be explored in a future COMPASS Technical Report.

References

1. Leatherdale ST, Brown KS, Carson V, Childs RA, Dubin JA, Elliott SJ, et al. The COMPASS study: A longitudinal hierarchical research platform for evaluating natural experiments related to changes in school-level programs, policies and built environment resources. *BMC Public Health* 2014;14(1).
2. Leatherdale ST, Burkhalter R. The substance use profile of Canadian youth: Exploring the prevalence of alcohol, drug and tobacco use by gender and grade. *Addict Behav* 2012;37(3):318-322.
3. Leatherdale ST, Manske S, Faulkner G, Arbour K, Bredin C. A multi-level examination of school programs, policies and resources associated with physical activity among elementary school youth in the PLAY-ON study. *Int J Behav Nutr Phys Act* 2010;7(6).
4. Leatherdale ST, McDonald PW, Cameron R, Brown KS. A multilevel analysis examining the relationship between social influences for smoking and smoking onset. *Am J Health Behav* 2005;29(6):520-530.
5. Leatherdale ST, Papadakis S. A Multi-Level Examination of the Association Between Older Social Models in the School Environment and Overweight and Obesity Among Younger Students. *J Youth Adolesc* 2011;40(3):361-372.
6. Thompson-Haile A, Laxer RE, Ledgley C, Leatherdale ST. Knowledge Broker Procedures for Contacting and Working with Participating Schools. 2015;3(3). Waterloo, Ontario: University of Waterloo. Available at: www.compass.uwaterloo.ca.

7. Brown KM, Elliott SJ, Robertson-Wilson J, Vine MM, Leatherdale ST. "Now What?" Perceived Factors Influencing Knowledge Exchange in School Health Research. *Health Promot Pract* 2018;19(4):590-600.
8. Brown KM, Elliott SJ, Leatherdale ST. Researchers supporting schools to improve health: Influential factors & outcomes of knowledge brokering in the COMPASS Study. *J Sch Health* 2018;88(1):54-64.
9. Brown KM, Elliott SJ, Robertson-Wilson J, Vine MM, Leatherdale ST. Can knowledge exchange support the implementation of a health-promoting schools approach? Perceived outcomes of knowledge exchange in the COMPASS study. *BMC Public Health* 2018;18(1):351.
10. Sharples J, Sheard M. Developing an evidence-informed support service for schools - Reflections on a UK model. *Evid Policy* 2015;11(4):577-587.
11. Oliver K, Innvar S, Lorenc T, Woodman J, Thomas J. A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC Health Serv Res* 2014;14(2).
12. Church D, Leatherdale ST. Development of the COMPASS School Health Profile. COMPASS Technical Report Series 2013;1(1). Waterloo, Ontario: University of Waterloo. Available at: www.compass.uwaterloo.ca.
13. Reel B, Bredin C, Leatherdale ST. COMPASS Year 5 and 6 School Recruitment and Retention: Technical Report Series. 2018; 5(1). Waterloo, Ontario: University of Waterloo. Available at: www.compass.uwaterloo.ca.
14. K. Brown. Narrowing the knowledge to action gap: A mixed methods exploration of the implementation of knowledge exchange strategies. University of Waterloo; 2017. Available at: <http://hdl.handle.net/10012/12227>.
15. Leatherdale ST, Cole A. Examining the impact of changes in school tobacco control policies and programs on current smoking and susceptibility to future smoking among youth in the first two years of the COMPASS study: looking back to move forward. *Tob Induc Dis*. 2015;13(1):8. Published 2015 Mar 30. doi:10.1186/s12971-015-0031-1
16. Samdal O, Rowling L. Theoretical and empirical base for implementation components of health-promoting schools. *Health Educ* 2011;111(5):367-390.
17. Langford R, Bonell C, Jones H, Poulou T, Murphy S, Waters E, et al. The World Health Organization's Health Promoting Schools framework: A Cochrane systematic review and meta-analysis. *BMC Public Health* 2015;15(1).