

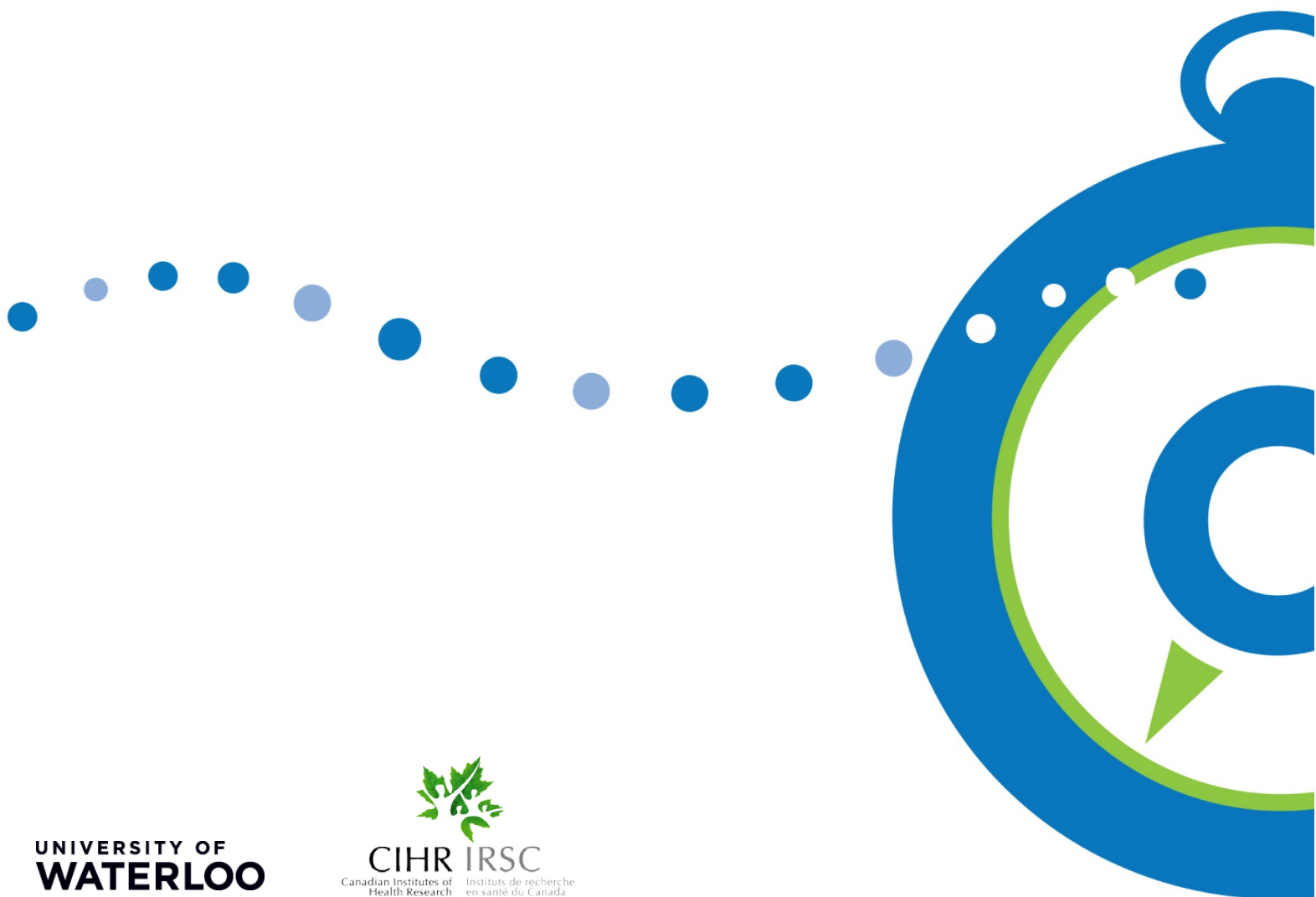


Cohort study evaluating how changes in school programs, policies, and resources impact youth health behaviours

Expansion of the COMPASS study to Guatemala: a program of training and research designed to improve youth health through school-based programs, policies and built environment resources

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Background

Non-communicable chronic diseases are a leading cause of death in Guatemala (and Central America). Obesity (and the correlates of obesity; physical inactivity and poor diet) and age-related increases in substance use (e.g., smoking, alcohol and drug use) among youth populations represent large areas of concern in Guatemala [1]. Not only are these behaviors common among Guatemalan youth, but these modifiable behaviors are related to chronic disease development [2]. Given that substance-use and obesity tend to be established during adolescence [3], it is critical to try to intervene among school-aged populations in Guatemala. At issue is the lack of surveillance and research infrastructure (and the funding with which to develop it) in Guatemala to effectively survey and monitor changes in youth health.

In Canada, the COMPASS system is a leading-edge research and knowledge-exchange platform being used to understand how to best intervene to prevent obesity and substance-use among youth populations [4-9]. Dr. Joaquin Barnoya (Fundación Aldo Castañeda, Guatemala) was introduced to the COMPASS system by a mutual colleague in the United States with knowledge of it and its principal investigator, Dr. Scott Leatherdale (University of Waterloo, Canada). Introductions and subsequent meetings between Drs. Barnoya and Leatherdale led to a partnership that would seek to ascertain if the COMPASS research infrastructure being used in Canada might be adapted for use in Guatemalan schools where there is a clear need for similar surveillance, research, evaluation, and knowledge-exchange infrastructure within school settings.

The International Development Research Centre (IDRC) provided a grant to fund two years of research work to this end. The first year was intended to meet three specific objectives: (a) have researchers and trainees from Guatemala attend a workshop in Canada to learn about population-level data-collection and evaluation systems; (b) adapt the COMPASS data collection instruments for use in Guatemala (e.g., translate to Spanish); and (c) pilot test the adapted tools and procedures in a sample of schools in Guatemala to determine the efficacy of such a research platform in that environment. The second year was intended for analyzing and disseminating results from the pilot test.

The goals of this project are: to provide a unique training and mentoring experience for research collaborators and trainees in Guatemala and Canada; to create new school-based surveillance, research, and evaluation infrastructure for Guatemala, and; to foster new international research partnerships focused on youth health.

Methods

Training

The Guatemalan research leads, Dr. Barnoya and Violeta Chacón, travelled to Canada to meet with the COMPASS team at the University of Waterloo, in June 2014. The first order of business was for the COMPASS team (led by Dr. Leatherdale and COMPASS project manager Chad Bredin) to lead an information session regarding the history, protocols and practices, and data collection instruments related to Leatherdale's youth health surveys, specifically the COMPASS system which was currently being utilized in Canada to collect data in the provinces of Ontario and Alberta.

These discussions formed the basis of the planning stage for expansion into Guatemala. Once the Waterloo team finished outlining the COMPASS research platform, the Guatemalan researchers proceeded to identify potential issues with both the data collection instruments and the protocols and practices, based on cultural and systemic differences in Guatemala. Once the issues were identified, solutions were decided upon for the adaptation of research tools and protocols (as outlined below).

The last aspect for training was a return trip in September/October of 2014, to Guatemala by Bredin to work with the Guatemalan partners on the first data collection and on how to properly enter student-level data into a database designed for the pilot test. More on this below.

Adaptation of COMPASS instruments, protocols, and practices for use in Guatemala

For COMPASS instruments, protocols, and practices to be pilot tested to determine their efficacy in Guatemala, they first had to be altered—where needed—for use in the Guatemalan context. While COMPASS is a cohort study designed to collect hierarchical longitudinal data from a convenience sample of secondary schools and the grade 9 to 12 students attending those schools [4], in Guatemala it would be utilized as a one-off cross-sectional survey in the initial pilot stage. In Guatemala, the COMPASS Student Questionnaire (C_q) would be used to collect the student-level data, while the COMPASS School Programs and Policies questionnaire (SPP) and COMPASS School Environment Application (Co-SEA) would be used to collect the school-level program, policy, and built-environment data. And, as in Canada, a School Health Profile—the knowledge exchange instrument—would be generated for each school containing school-specific data and recommendations for schools to follow to improve the health of their students.

Data collection instruments

In the C_q, 3 questions were removed because they did not make sense in the Guatemalan context (e.g., there is no point asking students “Are you taking a physical education class this year?” when PE classes are mandatory for all students in Guatemala) and 13 questions were modified (mostly simple wording alterations).

Most of the content in the SPP remained unchanged. Only 12 questions were altered, and this, again, was a case of cultural context (e.g., a reference to the Terry Fox Run is well understood in Canada, but would be entirely out of context in Guatemala).

The Co-SEA was not modified at all. Mostly this was due to the prospective cost of converting the app to Spanish and making contextual changes. Since the objective was to find out if the concept of Co-SEA was suitable in the Guatemalan context, and since the Guatemala team who would be carrying out the data collections are all fluent in English, creating a Guatemala-specific Co-SEA was not necessary at this time.

After the instruments’ contents were finalized, the instruments and other materials (e.g., parent information letters) were translated into Spanish—in Guatemala by a member of the team there.

Protocols and practices

Fundamentally, the protocols and practices developed for COMPASS remained intact for the proposed pilot test in Guatemala. There were only a few small changes that the research team deemed necessary to make.

First, while COMPASS in Canada sampled schools with grades 9-12 and with student populations of at least ~100 students per grade, these school characteristics were not common in Guatemala. Many schools (especially public schools) did not have all 4 grades, but rather had either the younger grades or the older ones (similar to junior high—or middle schools—and senior high schools in Canada) exclusively. Guatemalan secondary school system consists of two parts: three grades that are called “basic grades” and two called “professional training”. In order to include 13 to 18 year old students (equivalent to Canadian sampled students), we included all 5 secondary grades. As such, public schools were sampled so as to have all grades represented more-or-less evenly over multiple schools. Guatemalan schools also are not as big as Canadian schools, so a school’s size (i.e., having ~100 students per grade) was not a key determinant in sampling, like in Canada.

Second, while parent information letters in Canada are delivered by post (or via email for schools that have that capacity), in Guatemala the postal system was not considered reliable by the Guatemalan researchers to deliver these forms. As such, the protocols surrounding parent information had to be altered to allow for letters to be sent home with students, a practice that is usually not relied upon in Canada.

Pilot testing

School recruitment

Four secondary schools (two public and two private) within Guatemala City (n=2) and within the suburban areas around Guatemala City (n=2) were selected from the list of registered schools on the Guatemala Ministry of Education webpage [10]. Permission was then obtained from the Ministry of Education to approach these schools to participate (in Canada, this step would entail approaching a school board or school division to request permission to approach schools). As mentioned above, there were no specific inclusion criteria for selecting schools beyond having some of the requisite grades.

Student-level recruitment

All students in the four participating schools were invited to participate in the pilot study using active-information passive-consent permission protocols. This approach has been previously used for the COMPASS study in Canada and has been described elsewhere [4]. To send the parent permission letters, each school’s preferred communication channel was used. Printed letters were sent home with students in public schools and e-mails with the attached permission letters were sent to the parents’ mailing list in private schools. The University of Waterloo Office of Research Ethics and the Francisco Marroquín University’s Ethics Committee, in Guatemala, approved all procedures.

Data collection

Data collections took place from September 2014 to April 2015. Bredin travelled to Guatemala to visit all 4 schools and to supervise the first data collection. He observed, offered support, and

audited the Co-SEA implementation to ensure that everything would work. Chacón took the lead in the implementation of the C_q, the SPP, and the Co-SEA in all four schools.

Once data were collected, a staff member in Guatemala entered all student-level data from each school into a database created by Bredin. A 10% double-entry quality control check by Chacón was performed to ensure that the data entry was of sufficient quality: There was an error rate of 0.008%, which was considered acceptable by the research team. Upon completion, the electronic database was then sent to the University of Waterloo for processing. Co-SEA data were uploaded to the web-linked COMPASS server.

COMPASS School Health Profiles with the schools' findings—as per COMPASS knowledge-exchange practices—were created by Bredin and sent to Guatemala to be distributed to the schools by Chacón along with school honorarium cheques.

Research Findings

The C_q adaptation was a relatively simple task; only 3 questions were removed and 13 were modified (e.g., wording, examples, unit measures) according to what the partners in Guatemala thought would make sense in the Guatemalan context. From the SPP used in Canada, only 12 questions were modified. The Co-SEA was not modified at all. Questionnaires were then translated into Spanish by one of the members of the team in Guatemala.

Regarding school recruitment, the first four schools approached by the Guatemalan team agreed to participate. Schools were enthusiastic to participate in the study because they were interested to learn about their students' behaviors (e.g., the principal from one school was worried specifically about a perceived alcohol- and drug-use problem in his school and was looking to COMPASS to provide data to gauge the extent of the problem).

Student-level recruitment procedures were similar to those in Canada with the exception of sending parent information letters home with students. No parents refused to have their children participate (such is also often the case in Canada). Two to three children per school refused to participate, similar to rates in Canada. Questionnaire completion times were comparable to those of Canadian students (~30 minutes). Even though completing these types of questionnaires is not common in Guatemalan schools, students indicated—when asked by Chacón—that they were generally comfortable with the lines of questioning and answered honestly, that they did not have difficulty understanding or answering the questions, and that they had no issues with participating. In addition, all administrators were able to fully complete the SPP.

A total of 1277 adolescents participated in the pilot study. In terms of the number of students, public schools were larger than private schools. Participants' mean \pm SD age is 15.5 \pm 5.9 years and 51.5% were female. Most participants (47.5%) have normal weight and 12.2% are overweight or obese (Table 1). Results regarding physical activity, sedentary activity, and diet were similar to those in Canada. Fewer students in Guatemala reported marijuana use. Conversely, more students (especially in private schools) reported alcohol and tobacco use.

Table 1. Student demographics for COMPASS Guatemala schools; n (%)

	School 1	School 2	School 3	School 4	Total
Participants	649 (50.8)	232 (18.2)	319 (24.9)	77 (6.0)	1277
School type	Public	Public	Private	Private	
Grade distribution ¹					
Primer curso	222 (34.9)	0 (0.0)	77 (24.2)	14 (18.4)	313
Segundo curso	249 (39.1)	0 (0.0)	67 (21.0)	15 (19.7)	331
Tercer curso	166 (26.0)	0 (0.0)	46 (14.4)	14 (18.4)	226
Cuarto bachillerato	0 (0.0)	116 (54.2)	69 (21.6)	15 (19.7)	200
Quinto bachillerato	0 (0.0)	98 (45.8)	60 (18.8)	18 (23.7)	176
Age, mean ± SD	14.9 ± 6.7	17.0 ± 5.5	16.2 ± 1.6	16.0 ± 9.7	
Female ²	330 (51.2)	91 (39.6)	184 (57.9)	40 (52.6)	645
Weight status ³					
Underweight	22 (5.4)	9 (8.4)	6 (2.6)	1 (2.0)	38
Normal weight	292 (71.4)	72 (67.3)	200 (84.7)	43 (87.8)	607
Overweight	69 (16.9)	15 (14.0)	29 (12.3)	5 (10.2)	118
Obese	26 (6.4)	11 (10.3)	1 (0.4)	0 (0.0)	38

¹31 participants did not report or reported an incorrect grade

²8 participants did not report sex

³476 did not report either height or weight

Questionnaire completion rates were similar to those in Canada. There was a higher percentage of participants that were not able to report height and weight data, compared to Canadian students. While in Canada 13% of height and 16% of weight data are generally missing, in Guatemala 28% and 25% were missing. Furthermore, several students reported having breakfast as part of the school program, while none of the administrators reported having this program in any of the schools.

The School Health Profile was very well received by the school administrators; they found some of the findings surprising. One of the administrators was not expecting such a high prevalence of alcohol and tobacco use. Another administrator was surprised by the results on ‘school connectedness’: He was impressed that so many kids felt close to the school and said this result is positive and that he would let the parents know about it.

Limitations / Alterations

Regarding COMPASS procedures, the parent permission protocols are most likely to need alterations when the COMPASS study is implemented in Guatemala. Given that the communication between schools and parents is limited and the parents’ literacy levels are understood to be low, it is recommended that the schools—instead of each parent—give permission for student participation.

COMPASS instruments (C_q and SPP) were very well completed by the schools and students. A couple of questions need to be revised (e.g., the school breakfast program questions), but generally the instruments will remain mostly unchanged. If COMPASS is expanded for further use in Guatemala, the Co-SEA will need to be adapted and possibly translated. While the Co-SEA worked sufficiently well for the basic research purposes for which it was developed, at a detailed

level there were issues with some of the more stark differences between what can be found in a 'typical' Canadian school (for which the observation application was originally developed [11]) and what can be found in a 'typical' Guatemalan school. Thankfully for this current project, there is ample opportunity for submitting additional notes and photographs in the observation application so that any deficiencies in the application did not have any effects on the data. As this was the first time that the Guatemalan researchers had used such an application, the results were encouraging.

Impact

Results from this pilot study suggest that it is feasible to implement the COMPASS instruments and procedures in Guatemala (and could/should be piloted in other similar jurisdictions). In addition, this study generated data on chronic disease risk factors among Guatemalan adolescents and school policies, practices, and environmental indicators that were previously nonexistent. The work between the teams at the University of Waterloo and in Guatemala has contributed to the creation of new research capacity in Guatemala, has broadened the knowledge and understanding of this type of research amongst both groups, and has fostered what appears to be a successful and mutually-beneficial international research partnerships focused on youth health.

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