



# FINAL TECHNICAL REPORT FOR IDRC

## COMPASS – Guatemala

*Training and research to improve youth health in Guatemala* (Centre File: 107467-00020799-027)

University of Waterloo  
200 University Avenue West  
Waterloo, ON, N2L 3G1

31 March, 2016

Final technical report

Report prepared by:

Chad Bredin<sup>1</sup> ([cbredin@uwaterloo.ca](mailto:cbredin@uwaterloo.ca))

Violeta Chacón<sup>2</sup> ([violetachacon@gmail.com](mailto:violetachacon@gmail.com))

Dr. Joaquin Barnoya<sup>2,3</sup> ([barnoyaj@wudosis.wustl.edu](mailto:barnoyaj@wudosis.wustl.edu))

Dr. Scott Leatherdale<sup>4</sup> ([sleatherdale@uwaterloo.ca](mailto:sleatherdale@uwaterloo.ca))

1 - Propel Centre, University of Waterloo

2 - Fundación Aldo Castañeda, Guatemala

3 - Washington University, St. Louis, MO

4 - School of Public Health and Health Systems, University of Waterloo

## Table of Contents

Executive Summary.....	2
The Research Problem .....	2
Progress towards milestones.....	3
Milestone 1.1 - Training and mentoring for research collaborators and trainees in Guatemala and Canada	3
Milestone 1.2 - Create a school-based population health-assessment, surveillance, research and evaluation infrastructure appropriate for use in Guatemala .....	4
Tailoring Instruments.....	4
Pilot Testing.....	4
Milestone 1.3 - Foster the creation of international research partnerships, shared knowledge generation and transfer, and scientific expertise required to inform and adapt prevention actions focused on youth. .	5
Synthesis of research results and development outcomes .....	5
Impact .....	6
Project Outputs and Dissemination.....	7
Problems and Challenges.....	7
Administrative Reflections and Recommendations.....	8
Contact.....	8

## Executive Summary

The purpose of the COMPASS-Guatemala project was to test the effectiveness of existing Canadian student- and school-level data collection instruments and protocols when used in Guatemala to see if they could potentially be an option for future research partnerships looking to collect and analyse data, and disseminate findings specific to Guatemala. Lack of funding and infrastructure for population health initiatives such as youth health surveys—and the need for such surveillance—was the impetus for adapting existing instruments and methods to see if they would work in the Guatemalan context.

The COMPASS research platform proved to be an effective system for collecting data from schools and students in Guatemala, its simple and school-friendly protocols proved to be easily carried out by local researchers and heartily embraced by participating schools, and the initial data outputs have indicated the data are consistent and valid. It is now apparent that the instruments and methods work well in Guatemala and have the potential to have their use expanded in (and beyond) Guatemala, and to inform research partnerships moving forward. In the meantime, current findings from the pilot test are being disseminated via technical reports, peer-reviewed publications, and international conference presentations.

## The Research Problem

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., tobacco-, alcohol-, and drug-use) among youth populations represent large areas of concern in Guatemala. Not only are these behaviours common among Guatemalan youth, but these modifiable behaviours are related to chronic disease development. Given that substance-use and obesity tend to be established during adolescence, it is critical to try to intervene among school-aged populations in Guatemala.

In Canada, the COMPASS study 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. There has been increasing interest to determine if the COMPASS research infrastructure being used in Canada might be adapted for use in other jurisdictions; especially in low-middle income countries where there is a clear need for similar surveillance, research, and evaluation infrastructure, but insufficient funds to develop them. Based on specific needs arising in Guatemala and an appetite from researchers there to obtain the means to collect population-level data, this research project was developed. The specific objectives of this project were to: (a) invite researchers and trainees from Guatemala to attend a workshop in Canada to learn about population-level data-collection and evaluation systems; (b) adapt the COMPASS instruments for use in Guatemala (e.g., translation to Spanish); and (c) pilot test the adapted tools in a sample of schools in Guatemala to determine efficacy. This study was 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.

Further to these objectives, while the Canadian team was focused on this project as a technical test of COMPASS in Guatemala, the researchers in Guatemala were keen to get a hold of the actual data collected in the pilot study, aware of the value (due to rareness) of such data in Guatemala. The added value of this project is how it has supplied researchers in Guatemala with a ‘sneak-peek’ of some of the youth health behaviours in their country.

## Progress towards milestones

The grant provided by the IDRC was to cover two years of research work. The milestones—as laid out in the Grant Agreement—were to:

- 1.1 Provide a unique international training and mentoring experience for research collaborators and trainees in Guatemala and Canada;
- 1.2 Create a school-based population health-assessment, surveillance, research and evaluation infrastructure appropriate for use in Guatemala; and
- 1.3 Foster the creation of international research partnerships, shared knowledge generation and transfer, and scientific expertise required to inform and adapt prevention actions focused on youth.

### Milestone 1.1 - Training and mentoring for research collaborators and trainees in Guatemala and Canada

In June 2014, the Guatemalan partners, Dr. Joaquin Barnoya and Violeta Chacón, arrived in Canada to meet with COMPASS Principal Investigator Dr. Scott Leatherdale, COMPASS Project Manager Chad Bredin, and the rest of the COMPASS research team at the University of Waterloo (UW).

Over the course of their stay, multiple meetings were held to illustrate the protocols and practices involved in student- and school-level data collection in Canada (via COMPASS), and to discuss how those protocols and practices could be modified to fit within the Guatemalan context.

After the Guatemala contingent returned home, regular meetings via Skype and email between Waterloo and Guatemala continued the knowledge-sharing between the two groups.

The protocols and practices discussed included (but were not limited to); a) school recruitment; b) parental permission and student consent; c) instructing school administrators and teachers regarding data collection in their schools; d) collecting student-level data; e) collecting administrator-level data; f) collection of observational in-school built-environment data; and g) research ethics guidelines.

Following these meetings, in September/October of 2014, Bredin travelled to Guatemala to work with Chacón on the first data collection and to train Jessica Urbina (another staff member in Guatemala) how to properly enter student-level data into a database designed by Bredin for the pilot test. Chacón also took Bredin to see the other three schools that would be participating in the study.

The remaining 3 data collections were carried out independently by Chacón over the next few months with Bredin available (remotely) for guidance and advice when needed.

Following the completion of all the scheduled data collections, and the related knowledge translation and exchange activities, Barnoya and Chacón returned to Canada in June 2015 for meetings to reflect upon lessons learned during the pilot testing and to plan next steps, including the dissemination of findings.

The COMPASS-Guatemala study has been a valuable learning experience for all involved. The Guatemalan researchers have gained the knowledge required to carry out school- and student-level data collections and to understand the intricacies of this type of research. The Canadian researchers have confirmed the effectiveness of the COMPASS platform outside of use in Canada and have attained a better understanding of the idiosyncrasies of conducting research in developing societies and the environmental and behavioural differences between countries like Canada and Guatemala.

There are currently 3 Canadian investigators, 5 Canadian trainees, one Guatemalan investigator, and one Guatemalan trainee working on COMPASS-Guatemala publications.

## Milestone 1.2 - Create a school-based population health-assessment, surveillance, research and evaluation infrastructure appropriate for use in Guatemala

### Tailoring Instruments

During the meetings in Canada and during subsequent online conversations, the teams from Canada and Guatemala decided what questions needed to be changed or removed from the COMPASS questionnaires for use in Guatemala. Most of the content in the student and administrator questionnaires remained unchanged, except for the removal of a few questions that 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 the alteration of the wording in a few (e.g., changing questions about ‘food groups’ to match the Guatemala equivalent of the Canada’s Food Guide). After the questionnaire content was finalised, the instruments and other materials (e.g., parent information letters) were translated—in Guatemala by Urbina—into Spanish.

### Pilot Testing

The next stage of the study involved actually collecting student- and school-level data in Guatemalan schools to see if the COMPASS protocols and instruments work in such a different environment from Canada.

### Recruitment

Having received training on COMPASS practices and protocols, Chacón approached and recruited schools to participate. The target was to have 4 schools participate, and the first 4 schools that Chacón approached agreed to participate; 2 public schools and 2 private schools, as planned.

Chacón did not encounter much difficulty in first obtaining permission from the Ministry of Education in Guatemala to conduct the study in public schools, since the team in Guatemala had previous experience working with schools. Schools were enthusiastic to participate in the study, because they were interested to learn about their students’ behaviours (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).

### Data Collections

As mentioned above, Bredin travelled to Guatemala to visit all the participating schools and to work with Chacón on the first data collection in September, 2014. Before that, however, all communications with the first school were handled by Chacón, as was the printing and delivering of project materials to the school.

On the data collection day, Chacón took the lead in the implementation of the survey, while Bredin observed and offered support and advice when needed. Bredin and Chacón each conducted independent audits of the in-school built environment, compared notes afterwards, and addressed any differences in the results. On the whole, the data collection went extremely well. Further details regarding data collections are included below in *Synthesis of research results and development outcomes*.

Once the data collection had been completed at the first school, all student-level data were entered into a database by Urbina. Close and frequent communication between Chacón, Urbina, and Bredin ensured that the

data-entry phase (including a 10% quality control check by Chacón) went smoothly and that the data were of sufficient quality. Upon completion, the electronic database was then sent to Bredin back at the University of Waterloo for processing and cleaning. Bredin created a COMPASS School Health Profile with the school's findings—as per COMPASS knowledge translation and exchange practices—and sent it to Chacón to share with the school. The Profile was very well received by the school administration.

Once the first data collection was completed, the next 3 were completed independently by Chacón between February and April of 2015. All data collections went very well. Chacón had no problem delivering materials to the schools and collecting questionnaires on data collection days. She was also able to collect and upload the in-school built environment data to the web-linked COMPASS server (as such, Bredin could review the observational data remotely). Once again the student data were entered in Guatemala by Urbina and sent to Bredin for the creation of School Health Profiles.

While the processing of data and the creation of knowledge translation and exchange materials were still completed in Canada, the actual school recruitment, permission procedures, and data collections were all handled independently by the team in Guatemala. This highlights the advancement in know-how obtained by the Guatemalan team over the course of this study.

### Milestone 1.3 - Foster the creation of international research partnerships, shared knowledge generation and transfer, and scientific expertise required to inform and adapt prevention actions focused on youth.

The COMPASS-Guatemala study has enabled the creation of a research partnership between those requiring know-how and expertise and those who have years of experience to share. Besides the lessons learned regarding the 'how-to' aspect of the research in Guatemala, the simple act of completing a pilot test of the survey instruments has resulted in the creation of a (modest, but valuable) youth health behaviour dataset specific to Guatemala, the creation of school-specific reports for each of the participating schools (unprecedented in Guatemala), and has laid the groundwork for the creation of publications and presentations based on the Guatemala experience. These—along with the implementation-based findings—will all factor into improved understanding of youth health behaviours in Guatemala and how best to go about youth-based research there. International publications and presentations will make these findings available to other jurisdictions similar to Guatemala, potentially improving prevention actions focused on youth beyond Guatemala.

### Synthesis of research results and development outcomes

While the actual data are still being analysed, there are some preliminary findings that are very encouraging:

The adaptation of the questionnaires themselves proved to be a relatively simple task, as the questions that are included in the Canadian COMPASS questionnaires transferred well to the Guatemalan context. Had there been major changes to the data collection instruments, more work would have likely been necessary further down the line.

The actual data collections went very well, and proved to be very similar to data collections in Canada. For example, questionnaire completion times for the Guatemalan students were comparable to those of Canadian students (~30 minutes), only 2 or 3 students per school refused to participate (equal to rates in Canada), no

parents refused to have their children participate, and administrators were able to fully complete the administrator questionnaire.

During the data collections, Chacón had the opportunity to speak with some of the participating classes to obtain feedback from the students about their experience with completing the questionnaire (completing these types of questionnaires is not common in Guatemala like it is in Canada): Students indicated 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.

Initial data outputs indicate that the student-level behavioural data (e.g., smoking rates, physical activity rates, overweight-and-obese rates) generally meet with expectations and fall within the realm of what would be considered 'reasonable' (i.e., no data results seemed outlandish). Further and more detailed analysis will enhance our understanding of this.

In the Canadian iteration of COMPASS, parents are informed of the survey usually by letters sent via Canada Post, though sometimes schools have the capacity to email or send messages by auto-dial telephone. Adjustments had to be made for Guatemala, where mail service was immediately ruled out as being far too unreliable for this purpose. For the public schools, the COMPASS team had to rely on students taking information letters home to parents, while the private schools were able to email information to parents. The absence of a mail option and the stark difference between practices at public and private schools were interesting lessons.

Of all the COMPASS instruments and protocols utilised in Guatemala, the only one that may need to be adapted more is the in-school built-environment observation piece: While the observation application 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) 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 serious effects on the data. As this was the first time that the Guatemalan researchers had used such an application, the results were encouraging.

## Impact

There appears to be a great deal of potential for the COMPASS system to be adapted for use in Guatemala and other low-middle income countries. The enthusiasm with which the study was embraced by school stakeholders—and their eagerness for the results—is evidence of the reach that the project already enjoys in Guatemala. Schools were eager to learn more about the health behaviours of their students and COMPASS-Guatemala is the first opportunity schools have had to access that information. The appetite for this type of knowledge and what appears to be a genuine desire by schools to make improvements based on that knowledge, suggests that with further expansion in Guatemala and beyond, the data collection, analysis, and intervention research platform that COMPASS offers has the potential to yield significant population health improvements in low-middle income countries, the way that such studies (COMPASS included) have yielded such improvements in Canada for years. It should also be noted that while the sample of schools was not intended to be representative, the findings of this pilot supplies researchers with an idea of the current situation regarding chronic disease risk factors among Guatemalan youth.

Moreover, while the current study has been completed with the involvement of researchers in Canada, the experience of leading the implementation of the survey in the field, and the knowledge-exchange and training provided by the Canadian team has provided the Guatemalan team with new insights into how to successfully conduct population health studies with schools and youth. Upon this foundation of knowledge more advanced research infrastructure can be built.

Furthermore, being involved in this research has helped to expand the knowledge and expectations of the Canadian researchers who—prior to this—had a limited understanding of youth health environments in low-middle income countries. This will help expand the Canadian researchers' abilities to offer support to more economically-challenged regions, both internationally and domestically (e.g., First Nations communities in Canada).

## Project Outputs and Dissemination

In-person and on-line meetings between the Guatemalan team, the UW team, and collaborators from the Universities of Toronto and Alberta have already explored how best to proceed with the dissemination of the project findings so as to add to the limited knowledge regarding youth health in Guatemala and to encourage further adaptations of instruments and protocols for use in the low-middle income countries.

A paper on the methodology and the lessons learned in Guatemala has already been produced and made available on-line (<https://uwaterloo.ca/compass-system/publications/expansion-compass-study-guatemala-program-training>).

Peer-reviewed papers are currently being written by researchers and trainees in both Guatemala and Canada. These include papers specific to the situation in Guatemala and within-Guatemala comparisons (based on age, sex, public v private schools, etc.), as well as comparisons between what is being reported in Canada and what is reported in Guatemala.

An oral presentation on the COMPASS-Guatemala study was also presented at the 22nd Canadian Conference on Global Health (Cole A, Bredin C, Chacón V, Barnoya J, Leatherdale S. [November 2015]. *Building population health research capacity in Guatemala using the COMPASS system*. Oral presentation given at the 22<sup>nd</sup> Canadian Conference on Global Health, Montreal, QC.).

## Problems and Challenges

There were not too many problems or challenges related to the implementation of COMPASS in Guatemala. The two issues that had the most impact were the difficulty with transferring funds between institutions and the inability of the researchers to trust the Guatemalan postal system to deliver parent information letters.

Transferring funds from the host institution (UW) to the Fundación Aldo Castañeda in Guatemala (to cover the cost of researcher and data collection expenses) was continuously difficult and there were long delays between when the fund transfer request was submitted by the COMPASS team at UW and when the funds were actually received in Guatemala. At worst, it was a matter of more than a month, delaying salary payments to Chacón. Difficulties included having to deal in USD, the failure (again) by the Guatemalan postal system to deliver cheques, the overall lack of methods by which to make these transactions (no wiring, no bank transfers, etc.), and a seeming lack of knowledge by those in the institutions' Finance departments as to how best to

make such transfers. The situation improved as best practices were established, but funds were still routinely delayed by a week or more.

The lack of trust in the Guatemalan postal system was a lesser issue. We had to make sure packages or cheques destined for Guatemala were couriered (regardless of the additional cost), and we had to adjust our information/permission protocols from mailed letters home to parents to letters brought home by students; this adjustment ensured a better chance that parents would successfully receive the information letters on which to base their permission decisions.

## Administrative Reflections and Recommendations

Having completed the COMPASS-Guatemala study and having had time to reflect on the process, there are a few recommendations we have moving forward:

1. It would be useful for groups such as ours to know in advance what kinds of issues can arise when trying to transfer funds internationally, or even to have mechanisms available to help with that process.
2. While we are thankful for the grant support we received, and ecstatic about the success of the pilot study, there did not seem to be continuation funding available from the IDRC to expand this study to its logical next steps. This leaves the study in a bit of a state of uncertainty and risks having the study never being able to reach its full potential and have the kind of positive impact on health in Guatemala (and beyond) that it has the potential to have.
3. While the COMPASS-Guatemala study was completed quite inexpensively, it may not have been completed on budget without the in-kind contributions being somewhat higher than budgeted originally: A slightly higher amount of money being available for like grants in future would be a good idea.
4. While this grant was awarded before the IDRC's new Open Access Policy (that requires dissemination via open access venues) came into being, for projects that now have to manage within those guidelines, there should be money in new grants to cover publication fees for open access journals.
5. For any such future project that takes *existing* instruments, materials, protocols, and/or designs, it's suggested that there be a clear understanding that creators can expect that their intellectual property will be protected, while outlining what collaborators can or cannot do with data, instruments, etc. moving forward with any subsequent research.

## Contact

For further information, please contact:

Chad Bredin

University of Waterloo

[cbredin@uwaterloo.ca](mailto:cbredin@uwaterloo.ca)