

## WICI Student Funding Report

### *Overview of Research*

I am a recent graduate of the MSc Health Studies and Gerontology program at the University of Waterloo, and will be commencing my PhD in Public Health and Health systems this September. As a PhD candidate, I hope to further develop my knowledge and broaden the skills that are needed for a successful career in public health research. In recent years, research in this area has begun using a complex systems lens to address population-level health concerns, and I reached out to WICI for funding that would allow me to seek out additional training.

Systems theories are becoming increasingly popular in health studies, and prior to this course, I had experience in applying a complexity lens to more involved issues, such as health behaviour co-occurrence and obesity in Canada. My research focuses on obesity, and how psychosocial contributors to weight status, such as dieting, body image, and weight bias, influence our overall health. However, as I move forward into doctoral studies, I hope to continue investigating psychosocial weight-related topics and their relation with overall dietary patterns and quality among youth through a more applied systems lens. An increasing number of researchers have begun to apply complex systems research methods, such as agent-based modeling (ABM), to obesity-related topics and provided great insight for prevention initiatives.

### *Research Goals*

The complex system underlying obesity as a health concern requires transdisciplinary and collaborative public health approaches. I aimed to gain a general understanding of systems science modelling techniques, and learn about their applicability to complex public health issues. Considering the limited focus on complex systems in the School of Public Health and Health Systems, I sought funding from WICI to register in and attend a course at the University of Michigan's Graduate Summer Session in Epidemiology. The course, entitled "Complex Systems Modeling for Public Health Research", took place over five days (July 11-15, 2016) at the University of Michigan's Ann Arbor campus.

My participation in the course at the University of Michigan allowed me to gain a general understanding of what sorts of complex problems might benefit from systems science techniques, enhance my knowledge of systems science methods (ABM, systems dynamics, hybrid modelling), and discover best practices in this area of research. This course was comprised of lecture-style workshops from three systems science modellers who have experience working with public health issues, networking opportunities with other students from a variety of academic and professional backgrounds, and hands-on experience exploring simplified ABM, systems dynamics, and hybrid models.

Through these experiences, I am confident that I have gained an understanding of both the conceptual and technical requirements that are necessary in the application of systems science techniques to public health issues, such as obesity prevention. Additionally, throughout the duration of the course, students were required to develop their own final project and write a draft proposal for the application of a systems science method to a particular public health problem. I had the opportunity to

write a draft proposal for an ABM that investigated the mechanisms through which public health policies that focus on reducing weights might unintentionally increase individual weights via engagement in dieting behaviours (attached). Although this draft proposal was brief, and limited by a very general understanding of this method, I was able to receive feedback from a course teaching assistant that will allow me to continue building on the construction of this investigation.

### *Benefits of Participating in the Course*

At the outset of this course, the instructors informed us that we may leave in one of three positions: that we may be inspired to incorporate modelling techniques directly into our research, that we may decide to work within an interdisciplinary team that includes systems science modellers, or that we may simply become informed consumers of research that uses modelling tools. After participating in this course, I am confident that I am able to work with modellers as part of a multidisciplinary team and understand the fundamental concepts of how their work and techniques may be applicable to my research area of interest.

Although I do not have an intended PhD project, I am confident that in the duration of my program, I will work with systems science modellers/researchers to address some of the psychosocial contributors to obesity in the general population. Even if my work does not explicitly use these methods to answer my research question, my participation in this course has allowed me to think outside of the traditional epidemiology statistical lens of variables, p-values, and regression models. Instead, I can now conceptualize the feedback loops and potential instances of policy resistance that may arise when an intervention is implemented. I can visualize how agents may interact with one another in unique environments, outside of a set of pre-determined covariates, and respond to changes according to their own properties. My participation in this course will surely have a positive impact on my future research.