

# GEOHEALTH NETWORK



## Building Capacity for Health Geography

**APRIL 30, 2019**  
**9:00AM-5:00PM**

Dalla Lana School of Public Health  
155 College Street  
University of Toronto  
Toronto, ON, Canada





## Indigenous Land Acknowledgements

### **The GeoHealth Network Conference is located on the Treaty Lands and Territory of the Mississaugas of the Credit**

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca and, most recently, the Mississauga's of the Credit River. As settlers in Turtle Island, we directly benefit from the colonization and genocide of the indigenous people of this land. Today, this meeting place is still the home to many Indigenous people from across Turtle Island. We are grateful to have the opportunity to exist on this land and we must constantly engage in acts of decolonization.

Please find more education at the Mississaugas of the Credit First Nation website: <http://mncfn.ca/>. Also, the First Nations Information Governance Centre - OCAP Principles (Ownership, Control, Access and Possession) at <https://fnigc.ca/ocapr.html>



# Conference Organizing Committee and Support

## Organizing Committee



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Scientific Chair



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Maame Efua De-Heer, University of Toronto - St. George  
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Ankita Pal, University of Toronto - St. George  
Naomi Schwartz, University of Toronto - Mississauga  
Fikriyah Winata, University of Illinois at Urbana-Champaign

## Special Thank-You

Dr. Ron Buliung, Dr. Richard DiFrancesco, Dr. Tracey Galloway, Dr. Brent Hall, Yvonne Kenny, Samantha Kratochvil, Sandra Liang, Dr. Laura Rosella, Dr. Michael Widener, Maria Wowk, and Jonathan Van Dusen

## Thank you to our sponsors, without you, we could not offer this opportunity to so many students

Esri Canada  
Dr. Michael Widener, University of Toronto, Department of Geography and Planning  
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University of Toronto, Graduate Student's Union



# Welcome and Conference Information

Hello GeoHealth Network Conference Delegates!

Thank you for your excellent contributions of health geography research! Thanks to you, we have put together a day of high-quality science. Our theme is Building Capacity for Health Geography, and the collective scientific contributions will explore challenges and successes in implementing geography theory, tools, and data to answer a broad spectrum of health research questions. We are thrilled to welcome over 100 delegates from Canadian coast to coast, as well as many international health geographers. We will have keynote presentations by [Dr. Jason Gilliland](#) and [Dr. Sara Metcalf](#), over 40 research oral presentations, and two workshops that introduce important data science concepts and resources for health geography, hosted by teams from Esri Canada and St. Michael's Hospital Centre for Urban Health Solutions. Please click [here](#) for the short and long conference programs. We would like to invite everyone to our evening social after the conference at SPIN Toronto on April 30<sup>th</sup> starting at 7:00 pm. Tickets are FREE and include ping pong and refreshments. Please [RSVP here](#) by requesting a ticket.

USE HASHTAG: **#GeoHealthConference**

## Venue

This conference takes place at Dalla Lana School of Public Health for the entire day. This building is located at 155 College Street, Toronto. Closest subway station is Queens Park.



## Oral Presentations - Please send in advance:

Checklist:

1. Design in standard slide size (4:3)
2. Must be max 10 minutes (you will have another 5 minutes for discussion)
3. Save as a .ppt file
4. File name: lastname\_firstname\_sessionroom#
5. Email to [info@geohealthnetwork.com](mailto:info@geohealthnetwork.com) (Subject: *Presentation submission*) by **April 26<sup>th</sup> 2019**

## Photography and Videography

Please be advised there will be photography and videography at the conference. If you have any concerns or wish for your image not to be used for any website or promotional material, please email us ([info@geohealthnetwork.com](mailto:info@geohealthnetwork.com)) and tell us your name and a visual or clothing description and we will be sure to delete any photos you are in.

## Conference Awards

We are excited to present three awards of \$250 each. Two sponsored by Esri Canada for Excellence in GIS, and the GeoHealth Network Student Award, awarded for significant contributions to building capacity in health geography. Presenters must be present at the conference and the afternoon award ceremony to claim their award, otherwise we will award to the next place winner.

## Locked Room for Luggage

A luggage room will be available to store all luggage between 8:30am - 5:30pm. To access the luggage room, see the registration desk. Please **DO NOT** leave your valuables in this room. We are not responsible for lost or stolen belongs, however we will certainly help as much as we can.

## Access to Internet

Internet access will be available at the Dalla Lana School of Public Health for the duration of the conference. See the registration desk for Wifi access/password.



## Evening Social Event

We would like to invite everyone to our evening social after the conference at SPIN Toronto on April 30<sup>th</sup> starting at 7:00 pm. Tickets are FREE and include ping pong and refreshments.

Please RSVP here by requesting a ticket.

GEOHEALTH NETWORK POST-  
CONFERENCE SOCIAL

# SPIN TORONTO

Join us after the conference for some ping pong and get to know your fellow GeoHealth Network delegates!

This is a FREE EVENT and includes refreshment tickets and light snacks. Please RSVP on our website by requesting a ticket to let us know if you are coming.

RSVP: [geohealthnetwork.com](http://geohealthnetwork.com)

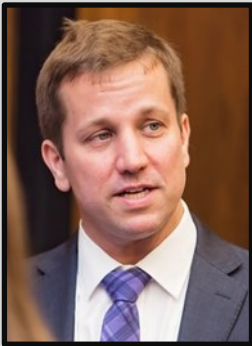
April 30, 2019 | 7 PM | 461 King St W.





## Keynote Speakers

### Opening Keynote: 9:15 am (HS 610)



#### PLACE-BASED COLLABORATIONS FOR CHILDREN'S HEALTH: BUILDING CAPACITY THROUGH COMMUNITY GEOGRAPHY

##### **Dr. Jason Gilliland**

Jason Gilliland (B.A.Hon, M.A., M.Arch., Ph.D) is Director of the Urban Development Program and Full Professor in the Dept of Geography, Dept of Paediatrics, School of Health Studies and Dept of Epidemiology & Biostatistics at Western University. He is also a Scientist with the Children's Health Research Institute and Lawson Health Research Institute, two of Canada's leading hospital-based research institutes. He has authored or co-authored over 120 peer-reviewed publications and has won several awards for his research, teaching, and community service. His research is primarily focused on exploring social and environmental determinants and developing interventions to ameliorate children's health issues, such as poor nutrition, physical inactivity, and obesity. He is also Director of the Human Environments Analysis Lab ([www.theheal.ca](http://www.theheal.ca)), an innovative research and training environment which specializes in community-based research and identifying interventions to public policy, programming and neighbourhood design to promote the health and quality of life of children and youth.

### Closing Keynote: 4:00 pm (HS 610)



#### LEVERAGING SYSTEMS SCIENCE TO MODEL HEALTH BELIEFS AND BEHAVIORS

##### **Dr. Sara Metcalf**

Dr. Sara Metcalf is a geography professor and systems scientist who conducts research on urban health and sustainability. As an MPI on NIH/NIDCR-funded projects, she uses dynamic models to simulate ways to improve oral health for underserved communities. As a systems scientist, she articulates feedback mechanisms and implements them in computer simulation models with stocks, flows, and networked agents. Dr. Metcalf engages in modeling activities for a range of research projects that examine ways of promoting societal benefits such as health equity, food justice, urban greening, and climate resilience. Dr. Metcalf's website can be found [here](#).



## Short Program

8:30AM – 9:00AM	<b>Registration and Refreshments</b> <i>Main Lobby—1st floor</i> Morning coffee - <i>HS 610 (6<sup>th</sup> floor main auditorium, west side of building)</i>
9:00AM – 9:15AM	<b>Land Acknowledgement and Welcome</b> <i>HS 610</i>
9:15AM – 10:00AM	<b>Opening Keynote Address by Dr. Jason Gilliland</b> <i>HS 610</i> <i>Introduced by Dr. Ron Buliung</i>
10 min transit time	
10:10AM – 11:20AM	<b>Morning Session I</b>  <b>Spatial Disparities in Health</b> – <i>HS100 (1<sup>st</sup> floor, west side of building)</i> <b>Sexual Health and Intimate Relationships</b> – <i>HS614 (6<sup>th</sup> floor breakout)</i> <b>Policy Contexts</b> – <i>HS696 (6<sup>th</sup> floor breakout)</i> <b>Mental Health I</b> – <i>HS618 (6<sup>th</sup> floor breakout)</i>
5 min transit time	
11:25AM – 12:35PM	<b>Morning Session II</b>  <b>Workshop: Using Geography to Define Health Indicators:</b> <b>The Ontario Community Health Profiles Partnership (OCHPP) Website</b> – <i>HS108</i> <b>Mental Health II</b> – <i>HS618</i> <b>Food Environments</b> – <i>HS100</i> <b>Environmental Health</b> – <i>HS614</i>
12:35PM – 1:45PM	<b>Lunch</b> <i>Lounge Space on the 7<sup>th</sup> Floor</i> <i>All catering is provided by the UToronto Tri-Campus Graduate Program in Geography and Planning</i>
1:45PM – 3:15PM	<b>Afternoon Session</b>  <b>Workshop: GIS for health research using the ArcGIS API for Python</b> <i>HS 108 (1st floor, west side of building)</i> <b>Community Health - Integrating Community Knowledge</b> – <i>HS614</i> <b>Access to Health Services - Inequalities</b> – <i>HS618</i> <b>Physical Activity and Active Transportation</b> – <i>HS106</i>
3:15PM – 3:45PM	<b>Coffee and Snack Break</b> <i>HS 610 (provided)</i>
3:45PM – 4:00PM	<b>Student Awards</b> <i>HS 610</i>
4:00PM – 4:45PM	<b>Closing Keynote Address by Dr. Sara Metcalf</b> <i>HS 610</i> <i>Introduced by Dr. Michael Widener</i>
4:45PM – 5:00PM	<b>Closing Remarks</b> <i>HS 610</i>
7:00PM	<b>Social Event</b> <i>SPIN Toronto (461 King St W)</i>



## Morning Session I: 10:10 - 11:20 am

### **Spatial Disparities in Health (HS 100)**

*Moderator: Vincent Kuuire*

Xiaojun Deng <i>Queen's University</i>	Survival Analysis of Older Chinese with Chronic Diseases: Evidence from China Health and Retirement Longitudinal Study in 2011, 2013 and 2015
Daniel Wiese <i>Temple University</i>	Using residential histories to estimate area-based poverty: An exploratory analysis of colon cancer survival in New Jersey
Elliott Yee <i>University of Toronto</i>	Geographic disparities in care and outcomes for non-curative pancreatic adenocarcinoma: a population-based study
Sarah M Mah <i>McGill University</i>	Neighbourhood environments, physical activity, and cardiometabolic death in Canada

### **Sexual Health and Intimate Relationships (HS 614)**

*Moderator: Maame Efua De-Heer*

Prince Michael Amegbor <i>Queen's University</i>	Examining the non-stationary association between women's post-secondary education and intimate partner violence (IPV) among women in Uganda: A GWR analysis
Clio Fregoli <i>University of Toronto</i>	Alternative Spaces of Sex Education: A Look into the Lived Experiences of Queer Women
Anna Ek <i>University of Toronto</i>	Intimate Relationships on the Spectrum

### **Policy Contexts (HS 696)**

*Moderator: Shen Lin*

Gabrielle Snow <i>Queen's University</i>	Are deprived communities in Ontario at increased risk for public school closures? Results from a socio-spatial analysis of closures from 2010 to 2018
Dominika Bhatia <i>University of Toronto</i>	Spatial analysis of cannabis and tobacco consumption among Canadian youth and adults
Kyle Plumb <i>Queen's University</i>	Placing Person-Centred Care: A Comparative Case Study of the Experience of Three Facilities in Ontario

### **Mental Health I (HS 618)**

*Moderator: Amber DeJohn*

Rebecca Barry <i>University of Toronto</i>	Rurality and Suicide
Antony Chum <i>St. Michael's Hospital/ Brock University</i>	Evaluating same-source bias in the association between Neighbourhood Social Environment and Depression
Shawna Hamilton <i>University of Waterloo</i>	Adapting Mental Health Programs to the Impacts of Climate Change
Celine Teo <i>Brock University</i>	Are rural LGB at a disadvantage compared to their counterparts?





## Morning Session II: 11:25am - 12:35pm

### OCHPP Workshop (HS 108)

St. Michael's Hospital: Centre for Urban Health Solutions	Using local area geography to define health and health-impacting indicators: The Ontario Community Health Profiles Partnership (OCHPP) Website. Please <u>RSVP</u> for this workshop and bring your own laptop.
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### Mental Health II (HS 618)

*Moderator: Amber DeJohn*

Regina Ding <i>McMaster University</i>	Evaluation of a caregiver-friendly workplace program (CFWP) intervention on the health of full-time caregiver employees (CEs): a time series analysis of intervention effects
Martin Rotenberg <i>University of Toronto</i>	Green space and the incidence of psychotic disorders in Toronto
Gina Martin <i>Western University</i>	Do Neighbourhood Characteristics Influence Motivations for Alcohol Use in Scottish Adolescents?
Joseph A. Braimah <i>Queen's University</i>	Coping strategies by persons with mental illness in Ghana: A scoping review

### Food Environments (HS 100)

*Moderator: Merryn Maynard*

Bochu Liu <i>University of Toronto</i>	Associations between activity space fast food exposure and fast food consumption among young adults: Findings from the Canada Food Study
Alexander Wray <i>Western University</i>	Food and farms: Reviewing the influence of Canadian local government restrictions on food environments
Clara Kaufmann <i>McGill University</i>	Neighbourhood fast food access and fast food consumption across the social gradient in Canada
Andrew Stevenson <i>McGill University</i>	The development of new food environment measures in Canada and their associations with diet and clinically-measured health outcomes

### Environmental Health (HS 614)

*Moderator: Fikriyah Winata*

Curtis Towle <i>Queen's University</i>	Projecting Populations of Canada's Metropolitan Areas: Implications for Health Geography
Hana Fu <i>Centre for Global Health Research</i>	Direct Measurement of Adult Mortality from Long-Term Satellite-based Particulate Matter 2.5 Exposure in India, 2001-13 from the Million Death Study
Katherine Woodstock <i>Queen's University</i>	An Evaluation of Spatial Lyme Disease Risk at Regional and Health Unit Scales Using Remotely Sensed Surface Temperature, GIS-based Habitat Suitability Data and Population Modelling
Anna Shadrova <i>University of Toronto</i>	A land use regression model for long-term ground-level Ozone: An application of mobile air pollution monitoring



## Afternoon Session: 1:45pm - 3:15pm

### Python Workshop (HS 108)

Jonathan Van Dusen <i>Esri Canada</i>	GIS analysis for health research using the ArcGIS API for Python. Please <u>RSVP</u> for this workshop and bring your own laptop.
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### Integrating Community Health Knowledge (HS 614)

*Moderator: Ankita Pal*

Selasi Dorkenoo <i>Ryerson University</i>	Accessing informal and formal social supports among older immigrants in Canada: A mixed-methods approach
Chris Buse <i>UBC</i>	Assessing the cumulative impacts of resource development: Integrated health impact assessment through data-driven story-telling
Sarah Nelson <i>Queen's University</i>	Indigenous health organizations and Indigenous community resurgence in urban areas
Navindra Baldeo <i>University of Toronto</i>	Access to Health Care Services in York Region: Lived Experiences of Older Immigrants with Diabetes
Chavon Niles <i>University of Toronto</i>	Living in the in-between: Immigrant and Refugee Youth in the Greater Toronto Area

### Access to Health Services - Inequalities (HS 618)

*Moderator: Dominika Bhatia*

Fikriyah Winata <i>University of Illinois at Urbana-Champaign</i>	Community Health Center: A Place Where Poor People Can Access Health Care
Sharada Weir <i>Ontario Medical Association</i>	Using CIHI's "Population Grouping Methodology" to map patient complexity
Qiuyi Zhang <i>University of Buffalo</i>	Modeling a Multi-level Intervention to Improve Oral Health for Chinese Americans
Shawna Cronin <i>University of Toronto</i>	Availability of health and community services for community dwelling persons with dementia

### Physical Activity and Active Transportation (HS 106)

*Moderator: Naomi Schwartz*

Brittany Barber <i>Dalhousie University</i>	How you measure matters: Access to physical activity-related facilities and associations with adolescent physical activity
Sylvanie Godillon <i>INRS UCS</i>	Evaluation of a school walking bus program in Quebec, Canada: positive impacts on active transport to school
Arslan Daniel <i>University of Toronto</i>	Pedestrian Traffic Injury Among People with a Pre-existing Medical Condition or Physical Disability in Toronto, Canada
Alina Medeiros <i>Western University</i>	Review of Equity Considerations in Active School Travel Interventions



# Abstracts - Morning Session I

## Spatial Disparities in Health (HS 100)

### Survival Analysis of Older Chinese with Chronic Diseases: Evidence from China Health and Retirement Longitudinal Study in 2011, 2013 and 2015

*Author: Xiaojun Deng (Queen's University) and Dr. Mark Rosenberg (Queen's University)*

By the end of 2017, there were 0.24 billion Chinese aged 60 and over, representing 17.3% of the total population in China. Among all the chronic diseases, cancer, diabetes, stroke, lung and heart diseases are top causes of death for older people before aged 70 in middle-income countries. Demographics and geographical factors may influence the length of survival of older people after diagnosis of a chronic disease. This paper focuses on the median survival time of observed older Chinese with chronic diseases, aged 60 years and over when recruited in 2011 for the China Health and Retirement Longitudinal Study (CHARLS). The tracking data come from three waves of CHARLS from 2011 to 2015, representing 7669 participants during the observed periods. The 14 chronic diseases investigated included the top causes of death mentioned above. The participants came from 31 provinces in China and were divided into five residential groups based on the 2017 GDP (nominal) per capita of the provinces where they were living. For this research, the participants' median survival time is compared among residential groups, urban/rural areas, gender and age groups. Some of the findings are: the median survival time of older Chinese living in urban areas with hypertension, heart problems, stomach or other digestive diseases is significantly longer than those living in rural areas. Female participants were likely to have a longer survival time for all chronic diseases. The implications for future policies related to improving life expectancy among the older population in China will be discussed.

### Using residential histories to estimate area-based poverty: An exploratory analysis of colon cancer survival in New Jersey

*Author: Daniel Wiese (Temple University), Kevin Henry (Temple University), Antoinette Stroup (New Jersey State Cancer Registry), Aniruddha Maiti (Temple University), Gerald Harris (Rutgers Cancer Institute), Shannon Lynch (Fox Chase Cancer Center) and Slobodan Vucetic (Temple University)*

Research Question: While area-SES based on place at diagnosis has been found to be associated with patient survival for many cancers, less is known about whether these associations would change when incorporating residential moves and SES changes over time. Methods: We analyzed differences in colon cancer (CC) survival, comparing estimates of neighborhood-socioeconomic-status (nSES) based on residence at time of diagnosis to nSES measures that incorporate residential histories. Cases from the New Jersey Cancer Registry included 4,049 residents aged 21-83 diagnosed with regional stage CC from 2006-2011 linked to residential histories data. nSES based on census tract poverty was measured four ways: 1) Poverty at diagnosis-location, 2) Average poverty considering all addresses 5-years before and after diagnosis, 3) Time-weighted poverty, 4) Time-and-place-varying poverty. For each scenario, Hazard Ratios (HRs) adjusted for age, sex, and stage were estimated from Cox regression. Results: Sixty-two percent of cases remained in a tract with the same poverty-level. Regardless of scenario, the models showed a significant, positive association between poverty and risk of CC death ( $p < 0.05$ ). HRs for each poverty-measure varied slightly, ranging from 1.009 for average poverty to 1.015 for poverty at diagnosis-location. Interpretation: The time-varying model indicated that HRs for poverty were not constant throughout the follow-up period, and the effects on survival time were found significantly different from average all-time poverty-level. Relevance: nSES does not remain same for all cases; therefore integrating residential histories into cancer registry data provides new opportunities to examine nSES on survival, and allows us to integrate lifecourse epidemiology approaches when analyzing cancer disparities.



## Abstracts - Morning Session I

### Spatial Disparities in Health (HS 100)

#### Geographic disparities in care and outcomes for non-curative pancreatic adenocarcinoma: a population-based study

*Author: Elliott Yee (U of T Faculty of Medicine, Sunnybrook Research Institute); Natalie Coburn (Sunnybrook Research Institute, Odette Cancer Centre – Sunnybrook Health Sciences Centre, U of T Department of Surgery, ICES); Laura Davis (Sunnybrook Research Institute); Alyson Mahar (University of Manitoba Department of Community Health Sciences); Ying Liu (U of T Department of Surgery); Julie Hallet (Sunnybrook Research Institute, Odette Cancer Centre – Sunnybrook Health Sciences Centre, U of T Department of Surgery, ICES)*

Research question: How do geographic distribution of care delivery and survival vary across Ontario for patients with non-curative pancreatic adenocarcinoma (PA)? Methods: A population-based analysis identified non-resected PA (2005-2017). Outcomes were medical oncology consultation, care by high-volume medical oncology provider, cancer-directed therapy (CDT), and survival. Geographic information system analysis was used to map outcomes across census-divisions. Multivariate models examined the adjusted effect of cancer-care-centre density by km<sup>2</sup> on outcomes. Results: Of 15,970 patients surviving a median of 3.3 months (IQR: 1.2-8.6), 38.5% received CDT, 65.6% had medical oncology consultation, and 17.1% saw a high-volume provider. Regions of comparable survival and care delivery were clustered throughout Ontario. Cancer-care-centres were distributed unevenly, with higher levels in Southern Ontario. Higher-level care centres clustered in regions with higher rates of consultation, CDT, and survival. Lower cancer-care-centre density was independently associated with lower likelihood of consultation and inferior survival, but not with CDT and care by high-volume providers. Interpretation: The majority of patients with non-curative PA did not receive CDT. Care delivery and survival exhibited high geographic variability. Cancer-care-centre density influenced access to medical oncology assessment and survival, but not high-volume provider care or CDT. Relevance: Lower rates of medical oncology consultation and survival for patients in regions with fewer cancer-care-centres suggest that care and outcomes for PA are distributed inequitably throughout Ontario. These findings suggest a need for improved access to PA care in certain regions of Ontario.

#### Neighbourhood environments, physical activity, and cardiometabolic death in Canada

*Author: Sarah M Mah (McGill University), Claudia Sanmartin, Mylene Riva, Kaberi Dasgupta, Nancy Ross*

Background: Neighbourhoods shape modifiable risk factors such as obesity, poor diet, and physical inactivity. Built environments that encourage active living hold promise as a policy lever for the prevention of cardiometabolic disease and mortality.

Methods: We examined the role of the built environment on cardiometabolic mortality, with an emphasis on one of the highest burden chronic diseases, Type 2 Diabetes (T2D). Neighbourhood built environment measures for active living were derived using a geographic information system for respondents of the Canadian Community Health Survey, for whom we have linked mortality records. A combination of self-reported diabetes status, as well as a population-based algorithm were employed to identify those who have T2D or are at higher risk of developing T2D, respectively. We assessed for relationships of walking and cycling with cardiometabolic mortality and walking and cycling with active living environments in the full sample, in three age groups, in the two clinical groups of interest. Results: Leisure walking and cycling was associated with lower cardiometabolic death in the overall sample and also in older adults and those on the T2D spectrum. Walking and cycling for both leisure and transport were graded by classes of active living environments. Favourable active living environments conferred a ten per cent reduction in cardiometabolic death for older adults. Conclusions: Active living-friendly environments support the walking and cycling that make up almost half of the overall leisure-time physical activity of older Canadians, and could translate into cardiometabolic-related survival gains for this age group.



# Abstracts - Morning Session I

## Sexual Health and Intimate Relationships (HS 614)

### Examining the non-stationary association between women's post-secondary education and intimate partner violence (IPV) among women in Uganda: A GWR analysis

*Author: Amegbor, P. M. (Queen's University) & Rosenberg, M. W. (Queen's University)*

Studies in Uganda show that a sizeable proportion – between 27% and 48% – of women suffer from intimate partner violence (IPV). IPV leads to negative health outcomes among women, including vulnerability to HIV infection, depression and suicide. Lower socioeconomic status among women has been identified as a major risk factor for exposure to IPV. Evidence from existing studies shows that higher education level among women serves as a protective measure against IPV. However, knowledge on spatial variations in IPV and higher education among women is limited. Using estimates from the 2016 Uganda Demographic and Health Survey data, we employed geographically weighted regression analysis to examine the spatial variability of the relationship between women's post-secondary education and IPV. The results of our OLS and GWR models show that women's post-secondary education significantly reduce their exposure to IPV. Mapping the GWR coefficient estimates of women's post-secondary education shows that the protective effect of women's post-secondary education is high in the eastern and central parts of Uganda. The findings suggest geographical variations in the relationship between women's post-secondary education and IPV. It also offers insight on areas for possible interventions measures to reduce IPV rates among women and increase women's access to post-secondary education.

### Alternative Spaces of Sex Education: A Look into the Lived Experiences of Queer Women

*Author: Clio Fregoli, (University of Toronto)*

The high school classroom is a formative space for young women in Canada to learn about sexuality and sexual health. However, sexual health education is often engrained in heteronormative expectations of sexuality, which exclude the experiences and health concerns of young queer women. This provokes the question of where, and how, young women who are outside of normative concepts of gender and sexuality, learn about sexual health. I analyse how queer women in Toronto experience sexual health education in school, and how alternative educational spaces contribute to their sexual health education growing up. This project draws on 30 in-depth, semi-structured interviews with queer women who attended public high school in Toronto. These interviews illustrate the exclusion of queer sexual health in Ontario's sex education curriculum, and both the benefits and drawbacks of learning about sex and sexuality from friends, family, books, media and online. This analysis of spaces of education will expand our knowledge of how and where queer women learn about sexual health, with the hope to ultimately improve sexual health education for queer women.

### Intimate relationships on the spectrum

*Author: Anna Ek (University of Toronto)*

Autism is a spectrum condition that is characterized among other identifying factors, by a difficulty in communicating and socializing. Like many other disabilities it is seen as incompatible with the establishment of intimate relationships. While there are real socio-economic and developmental factors contributing to why this might be the case it is also important to nuance this conception, as many autistic individuals do, in fact, have intimate partnerships. The necessarily social component of this disability makes it of interest to geographers of health, as it can restrict the places and spaces to which autistic people travel (see Davidson, J, 2002; Davidson, 2016; Bertilsdotter Rosqvist et al., 2013; Power, 2010 for geographers who have written about sociospatial disabilities such as agoraphobia and autism). This paper enters this conversation by examining the role that intimate relationships play for autistic individuals while drawing on feminist, and queer literatures on affect. To achieve, this I conduct a virtual ethnography, analyzing the personal blogs of 7 autistic activists. The resulting data shows that the intimate relationships of the participating autistic bloggers show themes of caregiving, increasing the social participation of their partners, helping with administrative tasks, everyday moments of compromise and negotiation of needs, having fun together, parenting, and sharing quality time. These results challenge the stereotypes around the kinds of relationships autistic people are capable of and they contribute to geographies of love which has yet to examine the love relationships of autistic individuals.



# Abstracts - Morning Session I

## Policy Contexts (HS 696)

### Are deprived communities in Ontario at increased risk for public school closures? Results from a socio-spatial analysis of closures from 2010 to 2018

*Gabrielle Snow (Queen's University), Dr. Patricia Collins (Supervisor)*

Over the past decade in Ontario, public schools have been permanently closing at worrying rates. As schools provide numerous benefits to communities beyond education, these closure decisions are nearly always hotly contested by affected residents. In June 2017, the Ontario Liberal government declared a moratorium on school closures in response to mounting concerns from Ontarians surrounding perceived inequities in the current school closure decision-making model, particularly among those who have felt that their communities have been disproportionately targeted. Stakeholder consultations began in 2017 to examine how best to change the approach to school closures in the province, and the moratorium has persisted since the change in government in 2018. Public schools are especially important assets in socially and economically deprived communities that have fewer resources at their disposal, yet it is unclear whether school closures are more common in such communities. To address this knowledge gap, this research had two objectives. The first objective was to develop a comprehensive dataset of school closure locations in Ontario that have occurred between 2010 and 2018. The second objective was to analyze the levels of material and social deprivation of the areas in which the closed schools are located to ascertain whether deprived communities have, in fact, been disproportionately targeted for closures. Analysis of the harmonized dataset is currently in process, and the results are forthcoming. Preliminary descriptive analyses reveal that there were 372 closures in Ontario from 2010 to 2018, with closures more common in small, deprived communities. The findings from this study will offer important insights regarding the extent and nature of inequities in school closures in Ontario and can be used to minimize future hardship on vulnerable communities by informing the process that is currently underway to revamp the school closure decision-making model.

### Spatial analysis of cannabis and tobacco consumption among Canadian youth and adults

*Author: Kuan Liu (University of Toronto), Shahriar Shams (University of Toronto), Dominika Bhatia (University of Toronto)*

The successful passing of Bill C-45, the Cannabis Act, marked Canada as the second country in the world to legalize and regulate recreational use of cannabis nationwide. The implementation of the act will restrict and discourage youth consumption, promote public health awareness on safe consumption and related health risks, and minimize criminal gains from cannabis trafficking. Under the new act, provinces and territories will be given authority to determine jurisdiction-specific regulation of cannabis distribution and sales, following established laws on tobacco products. The objective of this study is to perform a spatial analysis to investigate geographical variability in the consumption frequency of cannabis (medical and non-medical) among Canadian residents and to identify geo-socioeconomic factors associated with frequent cannabis consumption using the 2013, 2015, and 2017 cycles of the Canadian Tobacco, Alcohol and Drugs Survey from Statistics Canada. Preliminary results indicate an overall increase in the number of heavy cannabis smokers in Canada throughout the survey cycles, with a secular increase across most provinces. Statistically significant variations on the proportion of heavy or occasional smokers are observed between provinces. Nova Scotia consistently had the highest proportion of the population that were heavy or occasional smokers, while Quebec had the lowest. At a time when the specifics and impacts of cannabis policy remain uncertain, this evidence will help inform and guide province-level evidence-based policy on cannabis distribution and health promotion, education and advocacy interventions for targeted community on safe cannabis consumption.

### Placing Person-Centred Care: A Comparative Case Study of the Experience of Three Facilities in Ontario

*Author: Kyle Plumb (Queen's University)*

This paper discusses the findings of my PhD research project which involves comparing and contrasting three long-term care facilities in Ontario in terms of how their lived experience is influenced by their specific approach to, or philosophy of care. The purpose is to gain a greater understanding of how people living and working in long-term care facilities relate to these particular, yet representative, environments. The findings can ultimately be used to help inform best-practices for long-term care. The findings also have methodological, theoretical and practical implications giving residents and staff a discursive space to have a voice in their representation, conceptually by enriching the theoretical lens through which we view these environments with novel geographical concepts of place, and practically by providing insights back to the facilities involved. Information was gained through interviews with staff, family and residents in each facility as well as through observations in each facility to contextualize and form my own perspective. A comparative case study approach was undertaken highlighted by a non-representational style to animate the specific experiences of place in terms of their relational and material aspects. Comparisons between and within facilities, approaches and group experiences revealed provocative conclusions about the relationship between long-term care approaches and lived experiences which can contribute to policies and approaches that support a high quality of life for residents in long-term care.



## Abstracts - Morning Session I

### Mental Health I (HS 618)

#### Rurality and Suicide

*Rebecca Barry (University of Toronto), Jurgen Rehm (University of Toronto/Dresden University of Technology), Claire de Oliveira (University of Toronto, CAMH, ICES), Peter Gozdyra (ICES), Simon Chen (ICES), and Paul Kurdyak (University of Toronto, CAMH, ICES).*

Are individuals living in rural areas at increased risk of suicide and suicide attempts compared to their urban counterparts? This population-based nested case-control study examined death by suicide and attempted suicide by rural and urban status using Metropolitan Influence Zones (MIZ) and the Rurality Index of Ontario (RIO) Score. Cases and controls were matched 1:4 by age and sex. Data were obtained from administrative databases held at ICES; these capture all health care encounters, which occurred in Ontario from 2005 to 2017. Analyses controlled for income at the neighbourhood level, individual migration status and comorbidities, including psychiatric comorbidities. Findings suggest that rurality is a risk factor for completed and attempted suicide. Males living in the most rural areas are more likely to complete suicide compared to those in urban areas (OR=1.94, 95%CI=1.60-2.36). Both males and females living in the most rural areas have an increased risk of suicide attempts compared to their urban counterparts (male: OR=1.61, 95% CI=1.45-1.79); (female: 1.49, 95% CI=1.34-1.62). Rural females are not at a significantly increased risk of suicide compared to their urban counterparts (OR=1.15, 95%CI=0.79-1.69). These findings are similar for both measures of rurality. Potential reasons for why these disparities exist include differences in access to care, stigma around mental illness, social isolation, and access to means of suicide. The next step is to examine help-seeking behaviours prior to suicide or suicide attempt, and to use network analysis to examine how travel time may affect use of health services.

#### Evaluating same-source bias in the association between Neighbourhood Social Environment and Depression

*Anthony Chum (St. Michael's Hospital/Brock University)*

It is common in prior studies of the influence of neighbourhood characteristics on mental health to use participant-assessed neighbourhood exposures, which can lead to same-source bias since an individual's mental health status may influence their judgement of their neighbourhood. To avoid this potential bias, we evaluated the use of individually-assessed neighbourhood exposures to understand how they compare to collectively-assessed measures (by aggregating multiple responses within the same neighbourhood). This would increase the validity of the measure by decoupling the neighbourhood measure from an individual's mental health status. We conducted a stratified-randomized survey of 2411 adults across 87 census tracts in Toronto, Canada to investigate how self-reported (individually-assessed) social environmental neighbourhood measures compared to aggregated, collectively-assessed, measures for neighbourhood problems/disorder, safety, service quality, and linking, bonding & bridging social capital. The outcome, experience of major depression in the past 12 months, was measured using the Composite International Diagnostic Studies Depression Scale. 1) Individually-assessed neighbourhood problems, 2) low (individually-assessed) neighbourhood safety, 3) low (individually-assessed) neighbourhood service quality, and 4) low (individually-assessed) linking social capital were independently associated with depression (all at least  $p < 0.05$ ). However, when the individually assessed exposures were aggregated over residents in the same neighbourhood, none of them were significantly associated with depression. Our study provides evidence for same-source bias in studies of social environmental



## Abstracts - Morning Session I

### Mental Health I (HS 618)

#### Adapting Mental Health Programs to the Impacts of Climate Change

*Shawna Hamilton (University of Waterloo)*

Climate change is already adversely affecting human health, through various pathways such as exposure to natural disasters, reduced air quality, and the proliferation of vector-borne diseases. However, many of these impacts also create risks to mental health, for example, extreme heat events have been found to increase hospital visits for mood and behavioural disorders. The adverse effects of climate change on mental health suggest that health professionals need to adapt health services and programs to protect health. Existing frameworks that aim to provide guidance to health professionals for building climate-resilient health programs give limited direction to health decision makers about how to determine whether a program is vulnerable to climate change impacts, or how to increase a program's resiliency and effectiveness in the face of future impacts. The purpose of this research is to investigate how to identify the "climate sensitivity" of mental health programs and activities in Canada and the most effective ways of increasing their resilience. This research will be achieved through review of literature and one or more focus groups with Health Canada officials. The results will guide future climate change and mental health research to help health decision makers prepare for climate change and will provide guidance for assessing the climate-sensitivity of mental health programs in Canada.

#### Are rural LGB at a disadvantage compared to their counterparts?

*Celine Teo (Brock University) and Anthony Chum (Brock University)*

While social and geographical isolation negatively influence the mental health and wellbeing of the general population, LGB (Lesbian, Gay, and Bisexual) individuals may be particularly vulnerable to these risk factors. Given that LGB individuals suffer from poorer mental health and are at a higher risk of suicide-related behaviours compared to the general population, better understanding of the social etiology of the mental health disparity is needed to inform public policy. We designed a study to investigate the longitudinal association between mental health and a number of risk factors including social isolation/low social bonds, geographical isolation (i.e. rurality, lack of services, low accessibility), and LGB status. We are particularly interested in the use of longitudinal data over a 10-year period that allows us to assess the dynamics of social bond/isolation of LGB individuals across time and geography. Data of our study comes from the UK Household Longitudinal Study (UKHLS) collected from 2009 to 2018 (with approximately 40,000 households sampled). Study measures include the following (across 4 points in time): mental health status - i.e. the General Health Questionnaire (GHQ) and the SF-12 mental health score; sexual orientation; measures of social capital/bonds; and geographical predictors. We use random and fixed-effect models to estimate the association between changes in social capital, social bonds, geographical isolation, and changes in mental health over time (with interactions by sexual orientation). The presentation will be focused on the preliminary results of our study, and opening up the discussion to deepen our focus and analyses.





## Abstracts - Morning Session II

### Workshop: OCHPP Website (HS 108)

#### Using local area geography to define health and health-impacting indicators: The Ontario Community Health Profiles Partnership (OCHPP) Website

*Anne-Marie Tynan, Peter Gozdyra, Nadiya Minkovska, Gary Moloney (St. Michael's Hospital, Centre for Urban Health Solutions)*

Background: The Ontario Community Health Profiles Partnership (OCHPP) website provides high quality, area-level, health-related data and maps that is available to everyone. We provide relevant and timely information at no cost online and in a user-friendly format so that communities in Ontario can identify issues related to health equity and respond. Learning objectives: In this hands-on workshop, participants will be introduced to the OCHPP website followed by a deeper dive into the health indicators, data tables and maps available on the site. Participants will learn about the importance that specific indicators play in health system planning including the methods used to link administrative data to geographic locations to identify hot spots. We will present several different types of maps to illustrate the many ways data can be depicted. Exercise: Participants will have the opportunity to explore the OCHPP website together and will be assigned two case studies. The case studies will focus on issues faced by researchers and administrators especially at the local level. Participants will learn how to use the site's data and maps to gain a deeper understanding of the importance that small areas play in identifying hot spots and health inequities. Please RSVP for this workshop and bring your own laptop.

### Mental Health II (HS 618)

#### Evaluation of a caregiver-friendly workplace program (CFWP) intervention on the health of full-time caregiver employees (CEs): a time series analysis of intervention effects

*Regina Ding (McMaster University), Anastassios Dardas, Li Wang, Allison Williams*

Demographic trends in Canada, such as the growing labour force participation of women, declining average family size, and aging population have led to increased pressure on the working population to provide informal eldercare. Currently, there are 5.6 million Caregiver-Employees (CEs) in Canada. This dual role places physical and mental burden on the growing number of CEs, and is associated with adverse effects such as depression, anxiety, and poor sleep. The purpose of this intervention study is to identify significant changes in the health of CEs by evaluating the effectiveness of caregiver-friendly workplace programs (CFWPs). Our present investigation explores the functionality of CFWP interventions within the working environment through analyzing its interaction with several health indices, specifically, depression (CES-D), psychosocial (CRA), and self-reported health (SF-12). A health condition score, which consists of the aggregation of the three aforementioned scales, was used to measure changes in participant's pre-post intervention, as well as 12-16 months after the implementation of the intervention. Random intercept modelling, descriptive statistics, and data visualization was used to analyze response data over time. We observed a significant decrease in negative health symptoms in participants over the duration of the intervention study, suggesting that the intervention was successful.



## Abstracts - Morning Session II

### Mental Health II (HS 618)

#### Green space and the incidence of psychotic disorders in Toronto

*Martin Rotenberg (University of Toronto) Kelly Anderson (Western University), Kwame McKenzie (University of Toronto)*

Purpose: To test whether the findings of a recent study in Denmark, which found exposure to green space to mediate the risk of psychotic disorders, hold true in an urban environment. Methods: A subset of individuals residing in Toronto that were part of a larger retrospective cohort were followed for a 10-year period from the time of cohort entry in 1999. Cases were identified from administrative data. Neighbourhood level data was obtained via the Ontario Marginalization Index and Urban HEART. Poisson regression models adjusting for age, sex and neighbourhood marginalization were used to calculate incidence rate ratios based on the average amount of green space per neighbourhood. Neighbourhood walk score was utilized as a proxy measure for accessibility within the local environment. Results: In the cohort (n = 649,020) there was a significantly higher incidence of psychotic disorders in neighbourhoods with the lowest amounts of green space (IRR 1.26, 95% CI 1.16 - 1.38) when compared to neighbourhoods with the greatest amounts of green space. Preliminary results show an interaction with accessibility to the environment. Conclusions/Implications: Residing in an area with lower amounts of green space may increase the risk of a psychotic disorder, preliminary results suggest how individuals access the environment is also important. These findings suggest that modifications within the built and social environments may be important in future prevention and intervention efforts.

#### Do Neighbourhood Characteristics Influence Motivations for Alcohol Use in Scottish Adolescents?

*Gina Martin (Human Environments Analysis Laboratory, Department of Geography, Western University); Joanna Inchley (MRC/CSO Social and Public Health Sciences Unit, University of Glasgow); Candace Currie (Global Adolescent Health and Behaviour Research Unit, Glasgow Caledonian University)*

Rates of adolescent alcohol use are on the decline in Scotland; however, neighbourhood variations in drinking behaviours are still present, suggesting ongoing inequalities. Not known is whether young people exposed to different residential environments drink alcohol for different reasons. This work aims to determine if the characteristics of where Scottish adolescents live are associated with their motives for drinking, and, if so, whether drinking motives mediate the relationship between neighbourhood context and regular alcohol use. Analyses draw upon data of students in their 4th year of secondary school (approximately 15 years old), from the Scottish Health Behaviours in School-aged Children survey. Students answered questions about the area where they live, their alcohol use, and their motives for drinking alcohol. Findings show that coping motives for drinking vary across neighbourhoods. Additionally, coping motives mediate the relationships between neighbourhood deprivation, town size, and neighbourhood disorder with regular alcohol use. Policies that aim at improving the local neighbourhood and support methods to help young people cope better with life's stresses, may be particularly effective at reducing inequalities in adolescent alcohol use if targeted at small towns and areas with higher levels of socio-economic deprivation.

#### Coping strategies by persons with mental illness in Ghana: A scoping review

*Joseph Braimah (Department of Geography and Planning, Queen's University) Elijah Bisung (School of Kinesiology and Health Studies, Queen's University) Mark Rosenberg (Department of Geography and Planning, Queen's University)*

Evidence point to increasing prevalence of mental health disorders in Ghana. Yet, research to understand the mechanisms adopted to cope with mental illnesses is lacking in Ghana where psychiatric care is limited. The aim of this review is to identify and synthesize existing qualitative literature on the strategies adopted by persons with mental disorders in Ghana to cope with their conditions. A search of published articles on mental health in Ghana between 2005 and 2018 using CINAHL, EMBASE, PsychINFO, and SCOPUS was conducted. Eight articles met our inclusion criteria. We categorised the coping strategies adopted into five main themes: problem solving, support seeking, avoidance, distraction, and positive cognitive restructuring. Additionally, our findings reveal limited qualitative research on the coping mechanisms adopted by persons with mental illness in Ghana. This has implications for the design and implementation of appropriate mental health promotion interventions. We conclude with a recommendation for coordinated mental care service provision among relevant stakeholders in Ghana. There is also the need for increased qualitative research on mental disorders in Ghana.



## Abstracts - Morning Session II

### Food Environments (HS 100)

#### Associations between activity space fast food exposure and fast food consumption among young adults: Findings from the Canada Food Study

*Bochu Liu (University of Toronto), Michael Widener (University of Toronto), Thomas Burgoine (University of Cambridge), David Hammond (University of Waterloo)*

Some recent studies have associated fast food consumption with exposure to fast food retailers in the food environment, while others have found no relationship. These inconsistent findings may be due to different approaches when measuring exposure to fast food retail. Most existing studies only consider participants' exposure at a small number of locations, e.g. residential neighborhoods or schools. This may be problematic because these studies neglect to account for exposures that occur at other activity sites or during trip events, which typically represent a large portion of a person's total activity space. To address this problem, this paper examines a population of young Canadian, urban adults to explore whether higher activity space-based exposure to fast food restaurants leads to an increase in fast food consumption. The relationship between activity space-based exposure and consumption is explicitly compared to results derived to test the relationship between residential neighbourhood-based exposure and consumption. Activity locations and home locations of participants are identified using GPS trajectory data, and activity spaces are created by buffering activity locations. Negative binomial regression models are employed to answer the question: to what extent do various exposure measures explain the frequency of fast food consumption, while controlling for demographics, BMI, and weight stigma.

#### Food and farms: Reviewing the influence of Canadian local government restrictions on food environments

*Author: Alexander Wray (Western University) & Jason Gilliland (Western University)*

Canadian municipalities have received delegated authority from their provincial governments to regulate land uses in a specific area. Many municipalities have elected to incorporate some commitment to creating a just and sustainable food system, provoked by the United Nations Sustainable Development Goals and Paris Agreement. However, how many local governments are implementing these policies through zoning and legislative action? To answer this question, we present a content analysis of planning policy documents from Canada's ten largest metropolitan areas: Toronto, Montreal, Vancouver, Calgary, Edmonton, Ottawa-Gatineau, Halifax, Brampton-Mississauga, Kitchener-Waterloo-Cambridge, and Hamilton. Following from this content analysis, we review each area's zoning bylaws to determine the implementation status of the relevant food-specific planning policies. While almost all Canadian metros have incorporated some aspect of the food environment into their planning policies, almost none have made subsequent amendments to their bylaws to exact change on land use and zoning restrictions. For example, many neighbourhood mixed-use zones set gross floor area restrictions that are prohibitive for fresh grocers, and/or explicitly disallow grocery-type uses. Furthermore, planners have become fascinated with urban agriculture and gardening but have yet to translate this fad into amendments to property standards and zoning bylaws that would permit food-focused gardens and keeping small livestock. This disconnect between policy and legislation is problematic given the increasing concern about food swamps in Canadian communities. In conclusion, we lay out a vision for a geographically-informed analysis of "legalscapes" for local food systems - arriving at another example of health geography.



## Abstracts - Morning Session II

### Food Environments (HS 100)

#### Neighbourhood fast food access and fast food consumption across the social gradient in Canada

*Author: Clara Kaufmann (McGill University Department of Geography), Leia Minaker (University of Waterloo School of Planning), Michael Widener (University of Toronto Department of Geography), Kaberi Dasgupta (McGill University Department of Medicine), Nancy Ross (McGill Department of Geography)*

Food environments with high fast food density may increase risk for poor diet. The burden of diet-related chronic diseases is profoundly socially patterned in Canada, and past research suggests that unfavourable food environments may greater impact the diet of individuals with low socioeconomic status. We examined the relationship between neighbourhood fast food access and fast food consumption and investigated education level as a potential moderator in a representative Canadian population-based sample. Fast food retail outlets were extracted from the Statistics Canada Business Register and mapped in a geographic information system (ArcGIS) by their geocoded location. Absolute and relative fast food access measures were created using 1-km and 3-km network buffers in the neighbourhoods of respondents of the 2015 Canadian Community Health Survey-Nutrition (N = 20,487). Fast food consumption was measured using a question from the survey's 24-hour dietary recall. Univariate and multivariate models were used to test the interaction between fast food access, consumption, and education level. This study contributes a new fast food measure using a 'gold standard' dataset in a large population sample with wide geographic reach, which will further elucidate the link between the retail food environment and dietary behaviour.

#### The development of new food environment measures in Canada and their associations with diet and clinically-measured health outcomes

*Andrew C Stevenson (Department of Geography, McGill University) Leia M Minaker (School of Planning, University of Waterloo) Clara S Kaufmann (Department of Geography, McGill University), Michael J Widener (Department of Geography and Planning, University of Toronto) Kaberi Dasgupta ( Department of Epidemiology, Biostatistics and Occupational Health, McGill University) Nancy A Ross (Department of Geography, McGill University)*

In a systematic review that we conducted on neighbourhood access to food outlets, diet and body mass index (BMI) in Canada, we determined that there is moderate evidence of a food environment-BMI relationship, but inconclusive evidence of a food environment-diet quality relationship, the presumed mechanism. A key challenge is that studies rely on poor quality or localized secondary datasets to identify food outlets. We aim to address this by developing novel food environment measures using a new data source, the Statistics Canada Business Register (BR). The primary advantages are: reliable sources used to identify establishments, systematic coding of business function, and accurate geocoding. Food outlets were extracted from the BR and categorized using North American Industrial Classification System codes and name-based assignments. 21 categories of food outlets were created. In ArcMap, 1000m and 3000m network buffers were formed around the centroid of 56,000 neighbourhoods by creating service areas using the Network Analyst extension. Canada-wide absolute and relative food environment density measures were calculated by importing the food outlets from the BR into ArcMap according to their geocoded location and joining them within the buffers using the Spatial Join tool. Several measures were created to allow for flexibility in characterizing the food environment. These new measures will be linked with valid markers of diet (e.g., dietary quality, food security) and measured health outcomes (e.g., BMI, blood pressure, diabetes) from two large Canadian surveys. This will help determine how food environments affect a suite of health outcomes, and the presumed mechanism, diet.



## Abstracts - Morning Session II

### Environmental Health (HS 614)

#### Projecting Populations of Canada's Metropolitan Areas: Implications for Health Geography

*Curtis Towle (Queen's University)*

This paper assesses the performance and accuracy of a population projection model within the context of metropolitan areas. A bi-regional cohort-component model was executed using POPART (Population Projections for an Area, Region, or Town), a program developed by Wilson (2014). Supplementary material was used for the analysis of results and performance. Six retrospective projections were performed to test the validity of the projection model, using all of Québec's metropolitan areas with a five-year base period. Four types of trend extrapolation models were also tested using each city. All of POPART's tests performed more accurately than the trend extrapolation models, according to their mean average percent error, though at the expense of the convenience of trend extrapolation. Three prospective projections were then produced for Québec City's metropolitan area, using an analysis of past trends within each component to determine assumptions corresponding to low and high growth scenarios, and the current trends were held constant for a reference scenario. The efficiency and accuracy of POPART demonstrates its usefulness for Canada's sub-regions, as population projections inform future planning needs, including healthcare services. Overall, this research reveals the challenges associated with data collection and areal delineation at different government levels across the country.

#### Direct Measurement of Adult Mortality from Long-Term Satellite-based Particulate Matter 2.5 Exposure in India, 2001-13 from the Million Death Study

*Hana Fu (Centre for Global Health Research), Dr. Patrick Brown (University of Toronto), Dr. Prabhat Jha (University of Toronto)*

Ambient particulate matter of sizes smaller than 2.5  $\mu\text{m}$  in diameter (PM<sub>2.5</sub>) is believed to pose adverse effects on human health. In India, national average exposure to PM<sub>2.5</sub> is about five-times greater than the WHO recommended limit. Understanding of the PM<sub>2.5</sub> on cause-specific mortality in India have direct health policy implications. Here, we use nationally-representative mortality data and satellite-based PM<sub>2.5</sub> annual measurements from 2001-13 to elucidate the associations between cause-specific mortality and long-term exposure to PM<sub>2.5</sub>. We focused on asthma and chronic respiratory diseases (COPD), ischaemic heart disease (IHD), and stroke, using injury and violence deaths as controls. We fitted logistic model using Bayesian statistical method to investigate linear as well as non-linear effects of PM<sub>2.5</sub>. The models adjusted for sex, year, urban/rural residency, age, smoking status interacted with sex, sub-district female illiteracy, as well as spatial autocorrelation of mortality patterns. Before adjustment for spatial autocorrelation, COPD (OR 1.12; 99% CI 1.09-1.14) and IHD (1.07; 1.05-1.09) were associated with PM<sub>2.5</sub> exposure, while stroke was not significant (0.99; 0.97-1.02). After adjustment for spatial autocorrelation, COPD (1.02; 0.96-1.08) and IHD (1.03; 0.99-1.08) no longer showed significant associations with PM<sub>2.5</sub>, while stroke became positively significant (1.11; 1.05-1.18). The non-linear effects of PM<sub>2.5</sub> differed significantly from global models that relied mostly on data from high-income countries, where PM<sub>2.5</sub> exposure are much lower. This study highlights the necessity to use direct mortality quantification to estimates health effects of PM<sub>2.5</sub>. We also demonstrate the need to adjust for spatial autocorrelation in statistical models for robust estimates.



## Abstracts - Morning Session II

### Environmental Health (HS 614)

#### An Evaluation of Spatial Lyme Disease Risk at Regional and Health Unit Scales Using Remotely Sensed Surface Temperature, GIS-based Habitat Suitability Data and Population Modelling

*Katherine Woodstock (Queen's University); Dongmei Chen (Queen's University)*

Lyme disease is a severe public health concern in Ontario due to rising temperatures. Climate-based black-legged tick population modelling has been used extensively to model the extent of risk increase at provincial and national scales. This study evaluates the applicability of this approach at regional and health unit scales using high-resolution remotely sensed temperature data and habitat suitability data. These data were pre-processed in ArcMap then input into a population model to calculate tick basic reproductive number ( $R_0$ ), an indicator of reproductive success.  $R_0$  values were output based on monthly average temperatures from 2008 to 2017 in eastern Ontario, and 8-day average temperatures from 2016 to 2017 in the Kingston, Frontenac, and Lennox & Addington health unit.  $R_0$  consistently increased over eastern Ontario, with a maximum rate of change of 0.28 offspring per tick per year. The  $R_0$  rate of change ( $R_0'$ ) was mapped in ArcMap. Potential predictors of  $R_0'$  were evaluated in ArcMap, using the Geographically Weighted Regression, Ordinary Least Squares, and Zonal Statistics tools. This analysis indicated  $R_0'$  is correlated with elevation and land cover type. Model outputs were validated using Lyme disease exposure information collected by Public Health Ontario and geocoded using ArcMap. At the health unit scale, tick host density was varied according to habitat suitability. When host density was accounted for, urban areas become less suitable and forested areas become more suitable. This study provides increased insight into fine-resolution Lyme disease risk modelling and the impact of tick host dynamics on habitat suitability.

#### A land use regression model for long-term ground-level Ozone: An application of mobile air pollution monitoring

*Anna Shadrova (University of Toronto), Dr. Matthew Adams (University of Toronto)*

In this paper, we investigate the spatial variation of ground-level Ozone concentrations. Air pollution observations were obtained between 2012 and 2015 with mobile sampling in Hamilton, ON, Canada. The City of Hamilton is classified as an Air Zone 3, which is the most severe air quality category in Ontario and is characterized by a concentration of large industrial sources. Mobile monitored Ozone concentrations ranged from 0 to 237 ppb, with a mean concentration of 21 ppb. Four fixed location air pollution monitors indicated an average concentration of 26 ppb across the entire period. The mobile Ozone observations were adjusted to the long-term mean using fixed location monitors in the study area. Land use characteristics were calculated within buffers of the Ozone observation locations, which included road length, road type, traffic intensity, population density, and elevation. A linear regression model and a neural network model were used in a land use regression framework to interpolate air pollution concentrations in the study area. The model associated the air pollution observations to the surrounding land use characteristics. Model cross-validation included a traditional cross-validation approach and a spatial-blocking cross validation. The statistical model was applied to estimate the 2012-2015 average ground-level Ozone concentrations on a 100 m grid.



## Abstracts - Afternoon Session

### Python Workshop (HS 108)

GIS analysis for health research using the ArcGIS API for python

*Jonathan Van Dusen (Esri Canada)*

In this workshop, we will use the ArcGIS API for Python to perform spatial analysis in ArcGIS Online. ArcGIS Online includes a set of analysis tools that run in the cloud, rather than on your own computer's hardware, and using up-to-date street-network and elevation data provided by Esri. Using Python, an easy-to-use scripting language, you can automate your GIS analysis and share it with others, making it easier to reproduce your results, modify your analysis workflows, or repeat your methodology in a different study area. The case study for this workshop will use the example of finding optimal locations for a new amyotrophic lateral sclerosis (ALS) clinic in Southern California, accounting for fictional patient locations, candidate cities for the clinics, and drive-time areas. A basic understanding of Python (or similar languages such as JavaScript) is recommended for this workshop, but not required. Please RSVP for this workshop and bring your own laptop.

### Community Health - Integrating Community Knowledge (HS 614)

Accessing informal and formal social supports among older immigrants in Canada: A mixed-methods approach

*Selasi Dorkenoo (Ryerson University), Lu Wang (Ryerson University), Sepali Guruge (Ryerson University), Margaret Walton-Roberts (Wilfred Laurier University), Bharati Sethi (University of Western Ontario), Denise Spitzer (University of Ottawa)*

Older adults are the fastest growing and a highly culturally diverse age group in Canada. While immigrants represent 21% of Canada's total population, they represent 30% of its older population (65+). Social isolation is common among older immigrants, which limits their participation in community and civil society, increases income insecurity, affects health and wellbeing and increase their risk of elder abuse. The presentation presents important findings from an interdisciplinary project that examines the patterns and factors of accessing informal and formal social supports among older immigrants residing in Toronto, London, Waterloo and Ottawa, Canada. This community-based project employs a mixed-methods approach to engage stakeholders (older immigrants, their families, and providers of social, settlement, health, legal, housing, and transportation services). Firstly, spatial analyses are conducted to explore spatial gaps in social service provision to older immigrants from various language-specific communities (e.g., Arabic, Mandarin-Chinese, Spanish), using data from 2016 census and Toronto 211 website. Potential spatial accessibility is calculated using 2SFCA (2-step floating catchment area) model. Secondly, questionnaire survey conducted among older immigrants reveals individual behaviour in using different types of services. Thirdly, data from the focus groups conducted among various stakeholders are linked to the spatial and statistical analyses to foster our understanding on how individual and neighbourhood contexts affect the availability and use of social supports. Qualitative GIS and geo-visualization will highlight any discrepancies between calculated and revealed spatial access to social service locations. This mixed-methods approach is innovative and provides important methodological lessons.



## Abstracts - Afternoon Session

### Community Health - Integrating Community Knowledge (HS 614)

#### Assessing the cumulative impacts of resource development: Integrated health impact assessment through data-driven story-telling

*Chris G. Buse (University of British Columbia)*

Natural resource extraction and development activities interact with a host of land-uses that can leave lasting consequences for environmental, community and human health values. Novel research methods are required to account for past, present and future ‘cumulative impacts’ of resource extraction and development across broad geographic areas. Developing an integrated understanding of the interrelationships between environments, communities and health is therefore increasingly required to develop next generation research and policy action that can improve health equity and sustainability for all in the face of ecological challenges of the 21st century. This presentation draws inspiration from environmental, social and health impact assessment literatures to conceptualize a novel integrated assessment method that merges quantitative and qualitative data to inform an understanding of the cumulative environmental, community and health impacts of natural resource development across time and space. With a particular focus on northern British Columbia, Canada—a geographic area covering more than 450 000km<sup>2</sup> where resource development activities are the principle driver of economic development for its population of approximately 300 000 inhabitants—this presentation introduces “data-driven story-telling” as a mixed methods assessment approach combining literature reviews, secondary data analysis, geospatial analysis and a series of community-engaged story-telling sessions that comprise over 550 person hours of community participation. By merging statistical representations with narratives that articulate the lived experience of cumulative impacts, this presentation comments on the current state of cumulative impacts across Northern BC and contemporary policy approaches to natural resource development in relation to the pursuit of health equity.

#### Indigenous health organizations and Indigenous community resurgence in urban areas

*Sarah Nelson (Queen's University), Kathi Wilson (University of Toronto Mississauga)*

This paper offers an understanding of the work of Indigenous-led health organizations in one urban setting: Prince George, British Columbia, Canada. It addresses the research question: “what are the roles of Indigenous-led health organizations in fostering Indigenous community resurgence in urban areas?”. This paper is based on qualitative interviews and focus groups with 50 Indigenous clients of urban health services, and 15 health care providers in the city of Prince George in 2015-2016. Participants were asked how the work of Indigenous-led health organizations is unique, and their responses fall under three key findings: these organizations offer client-centred care; create safe spaces; and advocate for clients. Employing perspectives on place and relationships drawn from Indigenous critical theory and Indigenous community resurgence to analyze these findings demonstrates that Indigenous-led health organizations prioritize relationships in their day-to-day work, in a way that resonates with the values of many of the Indigenous community members they serve. This paper contributes novel understandings of the work of Indigenous community resurgence, in particular in urban areas and in the realm of health care. It highlights the already-existing strengths of Indigenous communities in urban areas through the ability of Indigenous-led health organizations to provide support for urban Indigenous community members in need, while acknowledging that these organizations cannot be the only answer. Indigenous community resurgence is a community-based process that goes a long way towards improving both access to health care and a sense of community and rights.





## Abstracts - Afternoon Session

### Community Health - Integrating Community Knowledge (HS 614)

#### Access to Health Care Services in York Region: Lived Experiences of Older Immigrants with Diabetes

*Navindra Baldeo (University of Toronto)*

York Region is one of Toronto's outer suburbs, and is one of the most socially and culturally diverse places in Ontario with immigrants making up a large part of the population. Up to this point, there are still few studies that directly address immigrant groups who face unique challenges in accessing health care services. This study asks the central research question "What are the experiences of accessing health care services for older Indian immigrants with diabetes, who are living in York Region?" The study uses a qualitative case study approach and in-depth interviews to investigate the lived experience of 20 Indian immigrants with diabetes to understand factors that influence their access to health care. The research was conducted in collaboration with a local community partner, the Social Services Network (SSN), who helped provide access to participants. A social determinants of health lens and health geography focus is used throughout, and various barriers to access including geographic, cultural, and socio-economic, are explored. Several themes emerged from the research involving: migration stories, spaces used for health and information, understanding daily life, barriers that impede access, support systems, and how to improve the health care system. The study recommends more local primary care clinics and health places that encompass cultural competency and address broader social determinants of health. It also recommends more investment into infrastructure to promote healthy living. It is important to centre concepts of place, space and the environment when aiming to improve access to health care services.

#### Living in the in-between: Immigrant and Refugee Youth in the Greater Toronto Area

*Chavon Niles (University of Toronto)*

This study asks, what are the migration experiences of racialized immigrant and refugee youth with in/visible disabilities living in the Greater Toronto Area (GTA)? How do they navigate (participate) in education, health and human services?

Ten (5 males and 5 females) racialized immigrant and refugee youth (16-24) with in/visible disabilities in the GTA participated in this study. Given that there is a paucity of research about immigrant youth, and adolescent years are considered a crucial period of identity, social and emotional development (Kilbride et al., 2000; Salehi, 2010; Seat, 2003) this study brings greater attention to this group. The study employed the use of two open-ended, semi-structured interviews with each participant. Using narratives, participants' stories disrupt, and challenge taken for granted assumptions of 'the normal body' and calls into question how deficit thinking about disability impacts participants' educational journey and access to health and human services. Participants speak to the many ways in which health and human services are constructed to serve an ideal population which leads to their "invisibilization." Moreover, participants offer us an opportunity to understand the interconnected of their migration experiences as migration journeys are not linear; it is rather complex. The project aims to have practical and policy importance that can help with resource allocation decision-making, and the development of more community-based programs for the under-served. Another end-goal is knowledge creation and dissemination within the immigrant youth literature, and further theorizing and operationalizing critical race, critical disability and postcolonial theory.



## Abstracts - Afternoon Session

### Access to Health Services and Inequalities (HS 618)

#### Community Health Center: A Place Where Poor People Can Access Health Care

*Fikriyah Winata (University of Illinois at Urbana-Champaign)*

The Indonesian Ministry of Health established community health centers (CHCs) in 1969 with the main objective was to provide the basic healthcare services for the poor. However, low-income community in most urbanized cities contends to get access to health care due to unequal numbers of poor people who need access with the number of CHCs available. This study aims to examine spatial and socioeconomic inequalities in the availability of CHCs in the Jakarta region. Kernel density tool in ArcGIS for Desktop 10.6 was used to look at the availability of CHCs and health professions. It calculates a magnitude-per-unit area from the point locations of CHCs. To determine the availability of health professions within the CHCs, I assigned the number of health professions to the population field. For both analyses, I used ArcGIS default bandwidth when calculating the density values. Local Indicator Spatial Association (LISA) was used to identify clusters of where low-income people are concentrated. Spatial regression lag model was used to determine the relationships between the number of CHCs and three indicators of the low-income community. Results show that CHCs and the health professions within them are unevenly distributed within Jakarta. CHCs are concentrated in the areas with a high number of letters of poverty and the number of unemployment ( $p$ -value = 0.0003), but lower number of low-income occupations. CHCs in Jakarta do provide healthcare access to the low-income community. However, some low-income areas lack CHCs, especially in the northeast and northwest of Jakarta, CHCs should be added in these areas.

#### Using CIHI's "Population Grouping Methodology" to map patient complexity

*Sharada Weir (Ontario Medical Association), Yin Li, Mitch Steffler, Shaun Shaikh, Thomas Fruehauf, Steve Nastos, Jasmin Kantarevic*

Research question: A small percentage of patients account for the majority of public expenditures on healthcare. The question is how best to predict future high-cost patients for policy and planning purposes. We examined the distribution of clinically complex patients across the Province using a new "Population Grouping Methodology" tool available from the Canadian Institute for Health Information (CIHI). Methods: Patient-level data were obtained from the Ontario Ministry of Health and Long-Term Care (MOHLTC). We used CIHI's algorithm, which groups approximately 30,000 diagnosis codes recorded during inpatient stays, day surgery/procedures, ED visits, and physician encounters into 226 distinct health conditions, to create clinical profiles. CIHI prospective model cost weights (developed on a 3-province pooled population using linear regression of baseline health conditions against next year cost) were used to obtain risk scores reflecting patient-level clinical complexity. Chronic disease prevalence and multimorbidity were summarized based on the presence of 1+, 2+, or 5+ chronic conditions. The StatsCan Postal Code Conversion File (PCCF+) was used to assign patients to census boundaries, and StatsCan shapefiles were used to create map boundaries. Area-level measures of socio-economic status (SES) were based on the 2016 Canadian Census. Results: We present choropleth maps of Ontario showing CIHI risk scores and chronic disease prevalence. These were overlaid with maps showing population density, demographics, SES, and health service providers. Interpretation and Relevance: Knowing where the most clinically complex patients reside, particularly in relation to other population characteristics, can help with health workforce planning and the formation of Ontario Health Teams.



## Abstracts - Afternoon Session

### Access to Health Services and Inequalities (HS 618)

#### Modeling a Multi-level Intervention to Improve Oral Health for Chinese Americans

*Qiuyi Zhang (University at Buffalo)*

Chinese Americans experience certain barriers (e.g., low incomes, diverse languages other than English, lack of insurance, cultural preferences, discrimination) when they seek healthcare services. These barriers may contribute to health disparities by causing reduced utilization of preventive and treatment services. To date, evidence to test hypotheses about these dynamics has been missing or hard to measure. This research takes a modeling approach to develop theory that accounts for dynamic relationships operating at multiple levels: from individuals to families to communities. A multi-level modeling approach allows for the interaction of factors at different levels of aggregation. This research applies methods of spatial statistics and spatially explicit agent-based modeling (ABM) to examine how demographic, socioeconomic, and geographic factors shape access to oral healthcare for low-income Chinese Americans in New York City. The model developed in this research will be used to test different intervention scenarios involving community health workers who facilitate care coordination and health promotion activities. Besides demographic characteristics and socioeconomic factors, this study also considers geographic factors and spatial behavior, such as distance and activity space. The overarching contribution of the research is to provide a complex systems science framework by which to understand access to oral healthcare for urban Chinese Americans and by extension other minority groups, integrating health-seeking behaviors at the individual level, barriers to care at multiple levels, and opportunities for health promotion at the community level.

#### Availability of health and community services for community dwelling persons with dementia

*Shawna Cronin (Institute of Health Policy, Management, and Evaluation, University of Toronto; KITE-Toronto Rehab-University Health Network), Susan Jaglal (Department of Physical Therapy, University of Toronto; KITE-Toronto Rehab-University Health Network; Institute for Clinical Evaluative Sciences, Toronto, Ontario)*

Primary care (PC) is well positioned to care for the growing cohort of community dwelling persons living with dementia (PLWD), however, the PC management of dementia relies on referral and linkage to other health and community resources to meet the functional and social needs of PLWD and their caregivers. The availability of these services in relation to PC services for PLWD is not known. To use geographic information systems (GIS) mapping techniques to examine the availability of PC practices and other health and community services for community dwelling PLWD in Ontario. This study used secondary data from sources including the University of Toronto Map Library and the Ministry of Health and Long-Term Care. ArcMap10.6.1 was used to create maps demonstrating existing health system services (PC practice) and community services (adult day programs, caregiver support, and education programs). Specifically, buffers were used to examine services within a 30-minute driving distance. Colours and symbols were used to create effective visualizations. Preliminary findings will include a series of thematic maps examining the location of PC in relation to other health and community services. Maps will be discussed in the context of a health services research framework, considering different models of PC delivery and health policy developments relevant to dementia health services. Understanding the geographic availability of health and community services for PLWD in relation to PC practices will provide a foundation with which to explore the mechanisms underlying health outcomes and availability of services.



## Abstracts - Afternoon Session

### Physical Activity and Active Transportation (HS 106)

#### How you measure matters: Access to physical activity-related facilities and associations with adolescent physical activity

*Brittany Barber (Dalhousie University), Daniel Rainham (Dalhousie University)*

Understanding factors within the built environment that influence adolescent behavior is important for promoting adolescent physical activity (PA); adolescent health behaviours are predictive of behaviours in adulthood. This study investigated how measurement of access to physical activity-related features of the built environment affects analysis of the association between these features and youth moderate-to-vigorous physical activity (MVPA). Participants included adolescent students (N=380, aged 12–16 years) from Halifax, Nova Scotia. A combination of accelerometry and global positioning system (GPS) devices was used to gather detailed locational data and measure MVPA behaviour and location over a one week period. In addition to GPS, the locations of each participant's home and school address were provided for geocoding and used when determining locations of recreational facilities in HRM through DMTI Enhanced Points of Interest (EPOI) database. To measure proximity and availability of recreation centers the distance to and count of locations were calculated using ESRI ArcMap. From both home and school locations a network-based buffer was created using a distance of 15-minute walkable distance along the road network. Access to PA features was defined by counts and proximity to features within walking distance (15 min walk) and beyond walking distance from home and school. Values were compared to counts and proximity to features that were visited. Multilevel regression was employed to ascertain the relationship between access and MVPA. There were significant differences in the number and total distance to PA features derived from walking distance and GPS-based distances for both home and school. Regression results indicate a significant association between proximity to PA features within 15-minute walk from home and school and MVPA; however, no significant relationship was found using GPS based measures. Many similar studies typically employ arbitrary, circular buffer based boundaries around home or school environments to investigate the relationship between PA features of the built environment and PA behaviours. This analysis shows clearly that results from these studies may be spurious, and that poor specification of access may lead to Type 1 error.

#### Evaluation of a school walking bus program in Quebec, Canada: positive impacts on active transport to school

*Sylvanie Godillon (INRS UCS)*

In Quebec, Canada, walking to school has been declining for twenty years. In recent years, initiatives have emerged to reverse this trend, like walking school buses (WSB). This initiative involve children walking under adult volunteers' supervision, on predefined routes and schedules. The Trotibus project sets up in Quebec in 2013 by the Canadian Cancer Society.

This contribution presents results from a survey evaluating the impact of this program on families' mobility and risk perception on the way to school. Our research approach is based on a mixed method combining a web-based survey filled by parents and children and interviews with twenty-two parents. The questionnaires were completed in two stages, before/at the beginning of their participation (Time 1 = 181 respondents), and six month after (Time 2 = 71 respondents). Interviews were conducted in the months following the end of the research. The results show that 58% of children went to school by motorized transport while 39% were already walking before the Trotibus program was offered at their school. At Time 2, 56% of respondents confirmed that their child was now walking to school in the morning (+17%). On the other hand, 24% of children continue to drive to school at Time 2. This can partly be explained by the fact that some Trotibus have never actually started after the piloting phase. The interviews show that the switch from motorized transport to walking is particularly beneficial for families who live further away from school and for whom motorized transport was initially perceived as the simplest solution in a context where family and professional schedules are often complex.



## Abstracts - Afternoon Session

### Physical Activity and Active Transportation (HS 106)

#### Pedestrian Traffic Injury Among People with a Pre-existing Medical Condition or Physical Disability in Toronto, Canada

*Arslan Daniel (University of Toronto Mississauga) and Ron Buliung (University of Toronto Mississauga)*

**Background:** Research into disability and pedestrian motor vehicle collisions (PMVC) emphasizes acquired disability, with little attention given to the presence of a pre-existing medical condition or disability (PMCPD) as a collision risk factor. The needs of pedestrians with PMCPD are overlooked or at best misunderstood within a prevention and infrastructure context that clearly privileges “able” bodied pedestrians. **Research Questions:** This research aims to 1) explore the relationship between PMCPD and sustaining pedestrian injury and 2) identify factors that impact or affect injury severity and frequency among pedestrians with PMCPD in Toronto, Canada. **Methods:** Collision data were obtained from the Toronto Police Services’ collision reporting center for the years 2000–2016. These data include: collision classification, pedestrian and vehicle action, injury severity and initial impact type. In this paper, we report on the results of an exploratory retrospective analysis of these data, comparing collision events between two groups, PMCPD and non-PMCPD pedestrians. **Results & Discussion:** Examining PMVC events reveals that pedestrians with a PMCPD are more likely to be hit while crossing without the right of way that is significantly related to ableism of infrastructure. Pedestrians with a PMCPD have a greater association to sustaining injuries at uncontrolled mid-block locations, which often results in greater injury severity. **Conclusion:** The needs of pedestrians with PMCPD must be considered when designing and evaluating road environments, to ensure they are not at increased risk of PMVC. People who identify as having a PMCPD should be included in the conversation about pedestrian injury prevention in meaningful ways.

#### Review of Equity Considerations in Active School Travel Interventions

*Alina Medeiros (University of Western Ontario), Adrian Buttazoni, Stephanie Coen, Katherine Wilson, Andrew Clark, Jason Gilliland*

In North America, recent trends have shown that fewer students today, than in previous generations, are engaging in active modes of travel to/from school (AST) such as walking, cycling, roller-blading, and scootering. This trend is of concern as AST can improve children’s health, air quality and road safety. Despite the success demonstrated by some interventions promoting AST, inequity remains with certain groups of students. This research aims to explore ways in which gender, ethnicity/race, SES, and urbanicity are taken into consideration in AST interventions. A systematic review was conducted to understand how these equity factors are treated in AST research. The literature search returned 50 relevant intervention studies. Results indicate that while effective at increasing rates overall of AST in students, interventions are more effective with boys than they are with girls. Translation of surveys into other languages was a common method to overcome barriers associated with race/ethnicity, however, English surveys have the highest return rates. Furthermore, low income schools showed the greatest uptake of AST, but, middle-income schools showed the greatest long-term behavioral changes. Finally, AST interventions are less successful in rural areas than urban and suburban areas likely due to a lack of pedestrian infrastructure. It would appear AST interventions are most effective for boys, whose parents are acculturated to the region, and families who live in middle-income urban neighborhoods. Future research will determine the specific barriers to AST for different subpopulations.