

## RESEARCH & PRACTICE DAY 2023

### POSTERS

Friday, November 24, 2023 | 1:30pm-2:30pm | MSB Stone Lobby

12PM Lunch & Opening

3:00PM Awards & Closing Remarks

NAME	PROGRAM	TITLE OF ABSTRACT
1 <b>Melina Albanese</b>	PhD Epidemiology	Prenatal triptan use for migraine and child neurodevelopment: A systematic review
2 <b>Alessandra Andreacchi</b>	PhD Epidemiology	Population-level changes in Canadian alcohol use: a framework-based approach for descriptive trends
3 <b>Madelaine Carter</b>	MPH Social & Behavioural Health Sciences	Barriers to Mental Health Services and Wanted Supports among Direct Support Professions: Impacts of COVID-19
4 <b>Claire Cook</b>	PhD Epidemiology	The association between reproductive health history and abdominal adipose tissue among postmenopausal women: results from the Women's Health Initiative
5 <b>Joanna Dos Santos</b>	MPH Epidemiology	Milestones in the natural course of the onset of e-cigarette dependence among adolescents and young adults: A longitudinal study
6 <b>Michelle Goonasekera</b>	MPH Social & Behavioural Health Sciences	What's your aging story? How digital storytelling can change the way we look at aging.
7 <b>Kelly Gregory</b>	PhD Social & Behavioural Health Sciences	Examining How Structural Conditions, Cultural Norms, and Institutional Practices Shape Diagnostic Delays for Women in Ontario: A critical qualitative study
8 <b>Sashini Kosgoda</b>	MPH Epidemiology	Using Speech Features in a Random Forest Machine Learning Model to Predict COPD Symptoms
9 <b>Kyara Liu</b>	MPH Social & Behavioural Health Sciences	"It's a low key thing of eugenics": Exploring the pandemic and non-pandemic related barriers to cervical and breast cancer screening for people with disabilities in Canada using a disability reproductive justice approach
10 <b>Kristina Meriel</b>	MPH Epidemiology	The Impact of Alcohol Control Policy on the Homicide Rate in Lithuania: A Time-series Analysis
11 <b>Ky Anh Nguyen</b>	MPH Nutrition and Dietetics	Diabetes Epidemic: A Recipe for Change Starting with Food
12 <b>Zoe O'Malley</b>	MPH Occupational & Environmental Health	Historical exposure to acid mists in Ontario mining refineries
13 <b>Serrina Philip</b>	MPH Social & Behavioural Health Sciences	Essential Features for Empowering NORCs in Your Community: Rapid Review

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NAME	PROGRAM	TITLE OF ABSTRACT
14 <b>Monica Prajapati</b>	MPH Epidemiology	The Association Between Learning Models and Child Health Behaviours During the COVID-19 Pandemic
15 <b>Marian Saab</b>	MPH Epidemiology	Alcohol Exposure and Related Harms in the World Health Organization's Western Pacific Region
16 <b>Adrian Sammy</b>	MPH Epidemiology	The Indirect Impacts of the COVID-19 Pandemic: Motor vehicle collision injuries in Ontario
17 <b>Hibah Sehar</b>	MPH Epidemiology	Exploring the Experiences of Receiving Pregnancy Care via Telehealth in Ontario: A Qualitative Study
18 <b>Paijani Sheth</b>	MPH Epidemiology	Measuring physician coding quality to improve verbal autopsies
19 <b>Shawmiga Sivakumaran</b>	MPH Epidemiology	Occupational Noise Exposure and Incident Risk of Hypertension Among Construction Workers in the Greater Toronto Area (GTA)
20 <b>Lauren Tailor</b>	PhD Epidemiology	Improving Access to HIV Care for Young Mothers Living with HIV in Zimbabwe
21 <b>Tijhiana Rose Thobani</b>	MPH Social & Behavioural Health Sciences	Caring for the Caregiver
22 <b>Amrit Tiwana</b>	MPH Epidemiology	Incidence of COVID-19 among workers compared to the general population of Ontario, Canada
23 <b>Savannah Torres-Salbach</b>	MPH Social & Behavioural Health Sciences	Perspectives of perinatal participants who have discontinued brief behavioral activation treatment: Insights from the SUMMIT Trial
24 <b>Snigdha Velugu</b>	PhD Social & Behavioural Health Sciences	Uncovering Menstrual Experiences of Slum-dwelling Menstruators in Hyderabad, India
25 <b>Linke Yu</b>	MPH Epidemiology	Assessment of Maternal and Infant Health Status in Durham Region
26 <b>Stephanie Ziembicki</b>	PhD Occupational & Environmental Health	Updating the CAREX Canada diesel engine exhaust job-exposure matrix with published measurement data

### Melina Albanese

(PhD Epidemiology)

#### **Prenatal triptan use for migraine and child neurodevelopment: A systematic review**

**Key Words:** Chronic Disease; Maternal and Child Health; Prevention

**Abstract:**

*Objective:* Triptans are a class of drugs commonly used as an abortive medication for migraine and can cross the placental barrier in pregnancy. The objective of this systematic review was to summarise and evaluate published literature examining the association between prenatal triptan use for migraine and child neurodevelopment.

*Methods:* Search terms for “pregnancy” and “triptans” were used to search MEDLINE, Embase, and CINAHL for relevant studies published from database inception to August 2023. Original research studies published in English examining the relationship between triptan use for maternal migraine during pregnancy and child neurodevelopment were included. An adapted version of the Systematic Assessment of Quality in Observational Research (SAQOR) protocol was used for quality assessment of included studies.

*Results:* Our search strategy retrieved 1092 articles, of which 5 met our inclusion criteria for the qualitative synthesis. All 5 studies used data from the Norwegian Mother and Child Cohort Study (MoBa). Studies selected for review all used parental self-report to measure triptan use and were all rated as moderate quality (n = 5, 100%). Outcome variables varied across studies and included externalising and internalising behaviour problems, communication, psychomotor function, temperament, and Attention-Deficit/Hyperactivity Disorder (ADHD). An association was observed between prenatal triptan use and externalising behaviours at ages 1.5-3, but not at age 5 or with other neurodevelopmental outcomes. All studies accounted for confounding by indication for migraine, but residual confounding by migraine severity was possible.

*Conclusion:* Prenatal triptan exposure may be associated with increased risk of externalising behaviours in children 1.5-3 years old. Future studies examining data outside of the MoBa cohort are required to test external validity of current findings. Additionally, future studies can expand the state of knowledge by considering different triptans as separate exposures and by utilizing more robust exposure measures that are less subject to recall bias.

### Alessandra Andreacchi

(PhD Epidemiology)

#### **Population-level changes in Canadian alcohol use: a framework-based approach for descriptive trends**

**Key Words:** Chronic Disease; Food and Nutrition; Mental Health and Addictions

**Abstract:**

*Background:* Heavy episodic drinking (HED) is an important indicator of risky alcohol use in a population and is a public health concern in Canada. Understanding population-level trends in HED requires that trends be decomposed to determine the influence of aging effects, generational effects, and external factors.

*Objective:* To examine gender-specific trends in HED in Canada from 2000 to 2021 by age group.

*Methods:* Data were utilized from repeated cross-sectional cycles of the Canadian Community Health Survey from 2000 to 2021 including respondents aged 12+ (n=1,167,831). HED was defined as monthly binge drinking (5+ drinks for men/4+ drinks for women on a single occasion) in the past 12 months. HED prevalence was examined over time by age group for men and women.

*Methods:* Data were utilized from repeated cross-sectional cycles of the Canadian Community Health Survey from 2000 to 2021 including respondents aged 12+ (n=1,167,831). HED was defined as monthly binge drinking (5+ drinks for men/4+ drinks for women on a single occasion) in the past 12 months. HED prevalence was

examined over time by age group for men and women.

*Results:* HED was more prevalent in men (24%) than women (12%) although this gender gap converged over the study period due to an overall decrease in HED among men and an increase among women. For men and women, HED increased during adolescence, was greatest at the end of young adulthood (approximately age 30) and then decreased through to older adulthood (age 65+). Gender-specific trends in HED over time varied by age group. Most notably, young adults aged 18-29 had the highest HED prevalence which declined since 2015-2016 by 14% in men and 9% in women. HED increased over the study period among women aged 30-64 but remained unchanged in men.

*Implications:* Trends over time in HED varied by gender and age group suggesting the possibility of gender-specific generational effects; generations born around the same time, such as adolescents and young adults born in 1990-2000, may have lower HED over the life course than other generations. Analytical models that utilize an age-period-cohort framework are necessary for disentangling population-level trends in HED and informing hypotheses underlying these changes.

## Madelaine Carter

(MPH Social & Behavioural Health Sciences)

### **Barriers to Mental Health Services and Wanted Supports among Direct Support Professions: Impacts of COVID-19**

**Key Words:** Marginalized Populations; Mental Health and Addictions; Social Determinants of Health

**Abstract:**

*Background:* The COVID-19 pandemic has significantly impacted the mental health of Direct Support Professionals (DSPs) caring for adults with intellectual developmental disabilities, adding new responsibilities to their demanding roles. This study aimed to explore barriers DSPs face when accessing mental health supports and if trends have changed over the past three years.

*Methods:* 1,801 workers supporting adults with intellectual and developmental disabilities completed an online survey about their mental health, work, and COVID-19 in 2021, 2022, and 2023. Chi-square tests and frequency analyses were done to explore the changes in responses throughout the years.

*Results:* For all three years, people who reported barriers were more likely to be younger, have less than ten years of experience, and have more significant mental distress. Education was protective against facing barriers, but only in 2023. Cost and time were consistently high barriers to accessing mental health support. Long wait times were highly reported in 2023, and being unsure how to get help or what kind of help to get was highly reported in 2021 and 2022. DSPs consistently reported time off as one of the main supports they wanted. In 2021, most wanted supports were COVID-specific, including wanting to do hobbies and see family and friends; in later years, these shifted to more systemic issues, such as more staff and improved financial compensation.

*Conclusion:* Despite COVID restrictions improving each year of the study, with virtually no restrictions in 2023, DSPs are still struggling with their mental health, and barriers are still present at high levels for this group. Thus, to ensure that DSPs feel supported by their industry and provide quality care for people with intellectual developmental disabilities, efforts must be made to address systemic issues contributing to their mental health and the barriers they face when accessing services.

## Claire Cook

(PhD Epidemiology)

### **The association between reproductive health history and abdominal adipose tissue among postmenopausal women: results from the Women's Health Initiative**

**Key Words:** Non-Communicable Diseases; Chronic Disease; Women's Health

### **Abstract:**

*Objective:* To describe differences in visceral adipose tissue (VAT), subcutaneous adipose tissue (SAT), total body fat, and anthropometric measures according to reproductive health history among postmenopausal women in the Women's Health Initiative (WHI).

*Methods:* We examined reproductive health history (collected at baseline) and abdominal adipose tissue with the WHI body composition sub-study. Adipose tissue measures included Dual Energy X-ray Absorptiometry (DXA) and anthropometric measures. Descriptive analyses and multivariable linear regression models were conducted.

*Results:* Among 10184 participants, most (69%) had completed high school, were married (62%), had a household income < \$75,000 (57%), mean age 62.4 years ( $\pm 7.4$ ), and were never smokers (55%). Women who had early menarche (< 9 years) or early menopause (<40 years) had greater adipose tissue levels. There was a dose-response relationship between parity and adiposity and no marked differences related to infertility and adiposity, apart from infertility specific to hormone dysregulation. Multivariable linear regression models demonstrate increased adiposity among women with early menarche; compared to those with age at menarche  $\leq 10$  years, those with age at 11, 12, 13, or 14 years had -5.87, 15.1, 21.8, and 23.3 cm<sup>2</sup> less VAT.

*Conclusion:* Among postmenopausal women, those with an earlier age at menarche, earlier age at menopause, greater parity, and shorter reproductive lifespan had increased levels of one or more of VAT, SAT, total body fat, and BMI. Reproductive health history is a presently untapped opportunity for chronic disease screening, identification, and prevention of chronic disease unique to postmenopausal women. As the Canadian population ages and accumulates chronic disease, an improved understanding of reproductive health and metabolic outcomes is critical to address changing demographic characteristics and health system needs. Further investigation of reproductive health risk factors and chronic disease outcomes among postmenopausal women would thus help prevent accumulation of chronic disease and promote healthy aging.

## **Joanna Dos Santos**

(MPH Epidemiology)

### **Milestones in the natural course of the onset of e-cigarette dependence among adolescents and young adults: A longitudinal study**

**Key Words:** Mental Health and Addictions

### **Abstract:**

*Introduction:* The prevalence of e-cigarette use has grown rapidly, particularly among youth, raising concerns about the potential for nicotine dependence and its implications for public health. While the addictive nature of traditional cigarette smoking has been extensively studied, our understanding of e-cigarette dependence is limited. This study aims to build upon the findings of previous studies by examining the natural course of e-cigarette dependence symptoms and milestones among youth and young adults who use e-cigarettes regularly.

*Methods:* Adolescents and young adults aged 16-25 living in Canada were recruited into an online survey in 2020. Current e-cigarette users were asked to respond questions assessing 15 items of dependence from the Penn-State Electronic Cigarette Dependence Index and the E-cigarette Dependence Scale for a total of 12 behavioural (e.g., difficulty refraining from vaping) and 3 frequency (e.g., using e-cigarette daily, weekly, or monthly) indicators of dependence milestones. Number of years after e-cigarette onset at which the cumulative probability of attaining each milestone was 25% was computed.

*Results:* Among 3402 participants, most (72.2%) were female, 74.7% were Caucasian, and 49.4% resided in Ontario. Nearly 40% of all 3,082 participants (1348 participants) vaped at least once a month (and therefore completed the PS-ECDI, EDS, and self-perceived measures). The majority of participants had endorsed each milestone except for awakening at night to vape (24.2%). A 25% cumulative probability of demonstrating e-cigarette dependence was achieved for 11 of 12 behaviour milestones by 5 months, as well as by daily e-cigarette use (99 days). Waking at night to vape was attained at 19 months. Monthly and weekly e-cigarette

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use attained a 25% cumulative probability at just over 25 months (730.5 days) and just over 6 months (185 days), respectively.

*Discussion:* Many current e-cigarette users developed symptoms of e-cigarette dependence within 5 months of survey.

## Michelle Goonasekera

(MPH Social & Behavioural Health Sciences)

### **What's your aging story? How digital storytelling can change the way we look at aging**

**Key Words:** Knowledge Translation; Marginalized Populations; Social Determinants of Health

**Abstract:** Ageism has far-reaching consequences on the health of older individuals, affecting multiple dimensions of well-being. It not only reduces life expectancy but also has detrimental effects on physical and mental health. Furthermore, ageism amplifies feelings of social isolation and loneliness while restricting older people's access to employment, education, and healthcare services, all of which play a significant role in determining overall health. As the global population ages, addressing ageism becomes increasingly important. Digital storytelling can be a powerful tool to address ageism by amplifying stories of aging, challenging stereotypes, and increasing education and awareness while reaching a large audience.

The Age Collective, an online platform, was developed to share diverse stories of aging, encompassing both challenges and triumphs across different age groups in order to raise awareness of and dismantle ageism.

We recruited participants through word of mouth and conducted interviews using audio or video equipment. Interview questions were tailored to the participant to reveal their unique story. Participants were also photographed. These interviews were condensed into short stories or videos with participant input and published on the project's Instagram page (@theagecollective) and website (theagecollective.com). Educational infographics on aging and ageism were also created and shared on Instagram.

From Feb 2022 – Oct 2023, we have shared stories from 32 participants and created 23 educational infographics. We have 886 followers and received 3,965 likes on the Instagram page. The website, established in June 2023, has achieved a unique viewership of 1,350 in the past 30 days.

In the digital age, initiatives like digital storytelling can reach global audiences, crossing cultural barriers and sparking international movements. By sharing personal aging stories, digital storytelling can humanize aging, dismantle ageism, and foster connections across generations in order to positively affect the health and well-being of older adults.

## Kelly Gregory

(PhD Social & Behavioural Health Sciences)

### **Examining How Structural Conditions, Cultural Norms, and Institutional Practices Shape Diagnostic Delays for Women in Ontario: A critical qualitative study**

**Key Words:** Chronic Disease; Gender Identity/Sexual Orientations (LGBTQ); Health Service Delivery

**Abstract:** A number of diseases and conditions that have notoriously long diagnostic periods manifest disproportionately among women. Endometriosis, for instance, takes on average 3-10 years to diagnose, while cardiovascular diseases, ADHD, and pain conditions such as fibromyalgia and rheumatoid arthritis represent other common examples. When the period of seeking care to the point at which a diagnosis is made becomes prolonged, women suffer from symptoms, lose confidence in healthcare providers and systems, and experience interruptions to their lives, relationships, and sense of self. Research has been conducted on delays in diagnosis; however, it largely focuses on a particular pathology and individual experience, obscuring the breadth and complexity of this problem. Furthermore, there is a significant gap in research on how diverse identities (e.g., race, class, ability), and socio-political structures of power influence those experiences.

Addressing these gaps will support more timely and improved quality of healthcare delivery, and improve the health and wellbeing of women across Canada. To do so, this investigation will ask: (1) “What are women’s experiences of diagnostic delay?” (2) “What do diagnostic delays mean to women?” and (3) “How are these experiences shaped by structural conditions, cultural norms, and institutional practices?” Critical phenomenology will help to articulate how participants make sense of experience, and for illuminating power structures within familiar routines of daily living. Intersectionality will provide a conceptual framework for examining how multiple identity characteristics can form interlocking systems of oppression. These theories will inform semi-structured interviews with patients and physicians from across Ontario who have experience with diagnostic delays. Using a critical approach to data analysis will reveal how structural and contextual factors may be shaping women’s experiences of diagnostic delay, and inform key recommendations for changes to health systems that will improve health equity for a diverse range of women.

## Sashini Kosgoda

(MPH Epidemiology)

### **Using Speech Features in a Random Forest Machine Learning Model to Predict COPD Symptoms**

**Key Words:** Machine Learning; Non-Communicable Diseases

**Abstract:**

*Introduction:* Chronic obstructive pulmonary disease (COPD) is a prevalent chronic lung disease in older adults. Older adults with COPD often do not seek medical attention until they experience an exacerbation. To address this issue, we developed a machine learning model which uses speech features to predict COPD symptoms. We aimed to understand important speech features for predicting different COPD symptoms before individuals experience exacerbations.

*Methods:* Voice recordings were collected using smartwatches from 7 patients over 6 months. Daily symptoms were recorded on a smartphone app and daily symptom scores were calculated to determine the occurrence of an exacerbation. We extracted speech features using the PulmoListener, an end-to-end speech processing pipeline using the openSMILE framework including loudness, pitch and formants. A Random Forest machine learning model was used to detect the occurrence of any COPD symptom and trained using K-fold cross-validation and feature selection (k=42). Given the imbalance in symptom outcomes, we employed different resampling techniques to improve performance. The average F1 score, accuracy and feature importance for each speech feature by symptom was calculated.

*Results:* The best-performing model using random oversampling achieved an F1 score of 0.488 and an accuracy of 0.474. The most important feature in that model involved loudness. Testing each symptom as a separate model, we saw that the F1 scores were much lower. Further, only 15 of the 42 selected speech features had some importance in classifying patients into the correct symptom.

*Discussion/Conclusion:* We suspect the lower F1 scores by individual symptoms may be due to the imbalance in the classes of each symptom. These identified speech features and our model’s performance shows promise in developing further models to explore the utility of speech features as a biomarker to predict symptoms early on before exacerbations occur.

## Kyara Liu

(MPH Social & Behavioural Health Sciences)

### **“It’s a low key thing of eugenics”: Exploring the pandemic and non-pandemic related barriers to cervical and breast cancer screening for people with disabilities in Canada using a disability reproductive justice approach**

**Key Words:** Marginalized Populations; Sexual/Reproductive Health; Disability Health

**Abstract:** Breast and cervical cancer screening is essential to the sexual and reproductive health of women and transgender people, resulting in reduced cancer incidence, improved outcomes, and lower mortality risk. However, previous studies have found lower rates of cancer screening among people with disabilities com-

pared to those without disabilities, and increased rates of adverse associated outcomes, including later-stage cancer diagnosis and lower survival rates (Cuypers et al., 2022; Hughes et al., 2022). As such, this paper aims to mobilize the disability reproductive justice framework as a relevant lens for examining disparities in breast and cervical cancer screening that have a detrimental impact on people with disabilities. A mixed deductive and inductive approach was used to analyze 32 interviews with people who self-identified as having a physical, sensory, psychiatric, intellectual and/or developmental disability. This study was grounded in community-based research and was guided by peer researchers with lived experiences of disability and community partners. Our findings revealed that disparities in breast and cervical cancer screening for disabled women are present and ongoing. Themes that emerged included intersectional injustices, inaccessible spaces and systems, barriers to the right to reproductive health care, lack of autonomy and self-determination, and recommendations from people with disabilities. We conclude that this inaccessibility to cancer screening is a form of modern-day eugenics. The lack of accommodation for people with disabilities and recognition of them as sexual beings has contributed to these evident health inequities. While cancer screening services were delayed and disrupted for the entire population during COVID-19, there needs to be a consideration for the heightened vulnerability of this group, as well as the existing marginalization that creates barriers to access in the first place.

## Kristina Meriel

(MPH Epidemiology)

### **The Impact of Alcohol Control Policy on the Homicide Rate in Lithuania: A Time-series Analysis**

**Key Words:** Mental Health and Addictions; Policy

#### **Abstract:**

*Aims:* Alcohol consumption is known to reduce inhibition and prompt aggressive behaviour linking alcohol consumption to interpersonal violence, and in sever cases homicide. Literature suggests the implementation of alcohol control policies leads to decrease in alcohol consumption, which would therefore decrease homicide mortality. The current study's aim is to evaluate the impact of the alcohol control policies implemented in January 2008, March 2017, and January 2018 on homicide rate among the Lithuania population aged 15-74 years.

*Methods:* An interrupted-time series analysis, using Generalize Additive Models (GAMs), was employed to assess the impact of each alcohol control policy. Monthly age-standardized homicide mortality rates were calculated using data from January 2001 to December 2018 where the 2018 Lithuania population was set as the standard. Analyses for overall and sex-stratified homicide mortality were conducted.

*Results:* GAM results for all policies for overall homicide mortality, and male-specific homicide mortality were not found significant. In females, a statistically significant negative effect was found for the January 2018 alcohol control policy ( $p = 0.013$ ). The other two policies in females were not found significant.

*Conclusions:* The findings of the current study suggest a need for more research in understanding the association between alcohol control policies and homicide mortality. Research efforts may be directed to evaluating alcohol-attributable homicides specifically and their association with alcohol control policies.

## Ky Anh Nguyen

(MPH Nutrition & Dietetics)

### **Diabetes Epidemic: A Recipe for Change Starting with Food**

**Key Words:** Food and Nutrition; Policy; Social Determinants of Health

**Abstract:** Diabetes is one of the most commonly diagnosed chronic diseases in Canada, affecting over 3 million Canadians. Its impact on quality of life spans from physical issues like vision impairment and neuropathy to mental health concerns such as anxiety and depression. Not only does it affect millions of people, diabetes also carries a significant cost burden on the health care system in Canada. Therefore, addressing this public health challenge requires comprehensive strategies targeting the social, physical, and food environments.



Notably, diabetes and food security are closely intertwined, with marginalized populations and low-income families experiencing higher diabetes prevalence. In this story map, we've gathered data from Statistics Canada on diabetes prevalence and household food security from the Canadian Community Health Survey to visually demonstrate the connection between food insecurity and diabetes prevalence in Toronto. The data reveals that Toronto has a significantly elevated prevalence of type 2 diabetes, coupled with a rising rate of urban food insecurity. Moreover, the map underscores a clear correlation between neighborhoods with the highest levels of food insecurity and increased diabetes prevalence. Given that socioeconomic disparities often hinder effective chronic disease management, we recommend that the City of Toronto consider the implementation of a pilot healthy food prescription program for eligible individuals with diabetes. We acknowledge that a foods-based solution is only one part of a wider social safety net. Therefore, the pilot program should be implemented alongside a more comprehensive "health-in-all" approach which targets income-based solutions and considers the unique needs of marginalized communities experiencing a higher prevalence of diabetes.

## Zoe O'Malley

(MPH Occupational & Environmental Health)

### **Historical exposure to acid mists in Ontario mining refineries**

**Key Words:** Occupational Health; Prevention

**Abstract:**

*Background:* Strong inorganic acid mists are generated in many ore refining processes, causing adverse effects including rare laryngeal cancer from sulfuric acid mist exposure. This study aims to characterize historical occupational exposure of acid mist in Ontario mining refineries.

*Methods:* Acid mist exposure data were collected from the Ontario Mining Exposure Database (OMED). OMED contains historic (1960-1992) documents/reports/surveys from mining companies, research organizations, health and safety associations, and the Ontario Ministry of Labor. Regression on order statistics (ROS) were used to model non-detectable samples (ND) and data were log base e transformed prior to analysis. Descriptive statistics of acid mist concentration for all acids were calculated and differences in median sulfuric acid concentrations were analyzed using Kruskal-Wallis and Wilcoxon rank sum tests as appropriate.

*Results:* Observations of sulfuric acid (n=1278, GM=0.21, GSD=2.46), hydrogen chloride (n=74, GM=3.39, GSD=4.77), hydrogen cyanide (n=52, GM=0.58, GSD=5.53), and acetic acid (n=28, GM=11.87, GSD=1.54) exposure have 95th percentile concentrations which exceed their current occupational exposure limits. All hydrogen fluoride (n=15) exposures were NDs (<0.82 mg/m<sup>3</sup>).

Overall, sulfuric acid exposures varied temporally, ranging from 0.01 to 19.59 mg/m<sup>3</sup> between 1971 to 1991. Time periods between 1976-1979 (GM=0.27, GSD=1.93) and 1988-1991 (GM=0.28, GSD=3.14) had significantly higher exposures than between 1980-1982 and 1985-1987 (p<0.05). Sulfuric acid exposures were significantly different by location and job title (p<0.05). Workers with the "cell stripper" job title (GM=0.24, GSD=2.23) had the highest concentration as well as samples taken in a zinc cellhouse (GM=0.22, GSD=2.38).

*Implications:* Historical acid mist exposures in Ontario mining refineries exceed current occupational exposure limits, which may put affected workers at risk of laryngeal cancer and respiratory disease. The results from this study may be used to investigate the risk of laryngeal cancer in Ontario miners or be used for adjudication of workers' compensation claims for laryngeal cancer.

## Serrina Philip

(MPH Social & Behavioural Health Sciences)

### **Essential Features for Empowering NORCs in Your Community: Rapid Review**

**Key Words:** Policy; Social Determinants of Health; Knowledge Translation

**Abstract:**

*Background:* Naturally Occurring Retirement Communities (NORCs) have the potential to promote aging in place and establish age-friendly environments. NORCs are geographical areas that have naturally become home to a large concentration of older adults (>30%) but are not purpose-built for older people. NORCs can be enhanced through onsite supports and services, driven by the needs of older residents, but to spread enhanced NORC models, information is needed on how to effectively implement these models across a range of contexts and settings.

*Current Study and Methods:* To further spread and scale enhanced NORC models, we are studying their implementation in 10 sites across Toronto and Barrie. Learnings will be used to create a NORC Implementation Toolkit. In this poster, we outline foundational work to rapidly review and synthesize key features of implementation toolkits.

*Results:* The rapid review illuminated six key elements to be helpful in establishing an enhanced NORC model, 1) Establishing roles and responsibilities of key knowledge users, 2) Conducting a community needs assessment 3) Resident engagement, 4) Optimizing communication strategies, 5) Sound evaluation procedures, and 6) Identifying and minimizing potential barriers.

*Conclusion:* We showcase key features of a NORC implementation toolkit that positions residents as vital stakeholders and active participants in decision-making processes to shape their NORC community. The broader project will help identify how to successfully implement NORC-based interventions in local communities.

## Monica Prajapati

(MPH Epidemiology)

### **The Association Between Learning Models and Child Health Behaviours During the COVID-19 Pandemic**

**Key Words:** Maternal and Child Health; Prevention; COVID-19 Pandemic

#### **Abstract:**

*Background:* School closures and reduced in-person learning during the COVID-19 pandemic may have had an unprecedented impact on children. There is limited research investigating the impact of learning models during the COVID-19 pandemic on child health behaviours.

*Objective:* To determine the association between school learning models (virtual vs. in-person) and child health behaviours (daily screen time, physical activity, outdoor time, sleep duration and sleep onset) during the pandemic, and whether these associations are modified by child's age, sex, and family income.

*Methods:* A repeated cross-sectional study was conducted in school aged children ages 4 to 13 years enrolled in The Applied Research Group for Kids (TARGet Kids!) primary care practice-based network in Toronto, Ontario between November 2020 and July 2022. Sociodemographic information and data on child learning models (virtual vs. in-person) and health behaviours (daily screen time, physical activity time, outdoor time, sleep duration, and time of sleep onset) were collected from repeated parent-reported questionnaires. Unadjusted and adjusted linear mixed-effects models were fit to determine the associations. Likelihood ratio test was conducted to examine potential effect modifiers.

*Results:* 367 children (51.0% male; mean age 7.3 years) with 799 observations on learning model were included. Adjusted results showed that compared to in-person school, virtual learning was associated with higher daily screen time (0.22 hours; 95% CI 0.03, 0.40;  $p = 0.02$ ), higher outdoor time (0.71 hours; 95% CI 0.56, 0.86;  $p < 0.001$ ), higher physical activity (0.64 hours; 95% CI 0.44, 0.85;  $p < 0.001$ ) and later sleep onset (0.22 hours; 95% CI 0.15, 0.28;  $p < 0.001$ ).

*Conclusion:* Virtual learning during the COVID-19 pandemic was associated with higher screen time, higher outdoor time, higher physical activity, and later sleep onset among school-aged children. We need to consider how to reduce overall screen time in the case of transitions to virtual learning in the future.

#### **Alcohol Exposure and Related Harms in the World Health Organization's Western Pacific Region**

**Key Words:** Global Health; Mental Health and Addictions

**Abstract:**

*Background:* The WHO's Western Pacific region has been identified previously for concerning increases in alcohol exposure. This study examines trends in alcohol exposure from 2000 to 2030 and concurrently investigates the alcohol-attributable disease burden in the region from 2000 to 2019.

*Methods:* Data for adult alcohol per capita consumption was obtained from country-validated data up to 2019. Projections until 2030 were acquired from the latest Global Status Report on Alcohol and Health. A comparative risk assessment framework was employed, combining alcohol exposure data and relative risk to estimate population attributable fractions. The WHO's Global Health Estimates were used to obtain mortality and morbidity data.

*Results:* The total adult per capita consumption of pure alcohol in the region of 5.5 L exceeded the global estimate of 5.3 L in 2019. Moreover, the highest alcohol consumers in the region lived in the Lao People's Democratic Republic (PDR) (12.2 L [95% CI 8.3 - 15.8]), Australia (10.1 L [7.4 - 13.2]), and New Zealand (9.9 L [7.2 - 12.9]). Between 2000 and 2019, significant increases in total adult alcohol per capita consumption were observed, led by Cambodia (419.8%), Vietnam (194.3%), and Mongolia (186.0%). Within the region, 484,233 (95 UI: 352,218 - 672,166) deaths and 22.1 (18.3 - 27.5) million disability-adjusted life-years (DALYs) lost were attributable to alcohol. At the country level, age-standardized alcohol-attributable deaths and DALYs lost were highest in Mongolia (123.1 deaths and 5240.0 DALYs lost per 100,000), Cambodia (83.8 deaths and 3147.0 DALYs lost per 100,000), and Lao PDR (75.0 deaths and 2956.9 DALYs lost per 100,000).

*Implications:* The Western Pacific region faces the continued crisis of high levels of alcohol use, especially in countries with lower human development indices. This situation requires a commitment to make the region safer by implementing cost-effective policies mitigating alcohol consumption and its associated harms.

### Adrian Sammy

(MPH Epidemiology)

#### **The Indirect Impacts of the COVID-19 Pandemic: Motor vehicle collision injuries in Ontario**

**Key Words:** Injury; Policy; Road Safety

**Abstract:**

*Background:* The policy response to the COVID-19 pandemic substantially changed driving conditions in Ontario. This project aimed to investigate the impact of the initial stay-at-home policy on trends in motor vehicle collision (MVC)-related emergency department (ED) visits and hospitalizations in Ontario, compared to the pre-pandemic period.

*Methods:* Data included all individuals in Ontario who had presented to an ED or been hospitalized for an MVC-related injury, from March 1st, 2016 to December 31st, 2022. An interrupted time series design was used by fitting a negative binomial regression model to the pre-pandemic data, including monthly indicator variables for seasonality and accounting for autocorrelation. Data were modeled for vehicle occupants, pedestrians and cyclists (including injuries involving a MV and non-MVCs). The pre-pandemic data were used to simulate the distribution of expected outcomes during the pandemic, which was compared to the actual observed outcome counts, using a median percent change.

*Results:* There was a significant decrease in observed ED visits (-31.52%; 95% CI: -35.43, -27.30), a non-significant decrease in hospitalizations (-6.0%, 95% CI: -13.2, 1.6) among occupants during the pandemic. Results were similar for pedestrians. Among MVC cyclists, there was a non-significant increase in ED visits (12.80%, 95% CI: -8.22, 39.41) and a significant increase in hospitalizations (46.00%, 95% CI: 11.59, 93.59). Among

non-MVC cyclists, there was a significant increase in both ED visits (46.99%, 95% CI: 12.51, 86.77) and hospitalizations (50.08%, 95% CI: 8.21, 101.20).

*Conclusions:* Due to the decrease in vehicle volume during the pandemic, we expected to observe a decrease in MVC rates among occupants and pedestrians. The increase in the number of cyclist's early pandemic, likely contributed increased injuries. This work identifies vulnerable road-user populations most affected by pandemic-related policies and can inform policymakers and injury prevention practitioners to protect these populations in the future.

## Hibah Sehar

(MPH Epidemiology)

### **Exploring the Experiences of Receiving Pregnancy Care via Telehealth in Ontario: A Qualitative Study**

**Key Words:** Maternal and Child Health; Telehealth/Health Informatics

**Abstract:** Telehealth is healthcare delivery using telecommunication methods, including audio and virtual calls. In Ontario, Canada during the COVID-19 pandemic, telehealth was utilized in obstetrical care, and many pregnant women had virtual meetings with their healthcare providers (HCP) and monitored their vital signs at home. As the health care system is recovering from the pandemic, it is important to understand the overall experiences of patients who use telehealth services. The objective of this qualitative study was to examine the experience of women who used telemedicine for pregnancy care in Ontario. Semi-structured interviews were conducted with 13 women who used telehealth for their pregnancy or postpartum care within the last four years. Women were asked about benefits and challenges of using telemedicine and offered suggestions for improvement of telehealth services. Thematic analysis was applied to inductively generate key themes from the data. Findings suggest that while telemedicine is convenient for seeking medical advice and receiving responses to general questions as well as for removing geographic barriers, it may feel less personal. Some participants also indicated a lack of rapport with their health care providers and felt like they needed to "be their own doctors" when using telehealth. Using mobile applications to schedule meetings, message physicians, and review doctors' notes after appointments was reported as a benefit of telehealth care, which also improved access to care for participants. These findings suggest that telehealth may offer benefits for some patients and can be used alongside in-person appointments.

## Paijani Sheth

(MPH Epidemiology)

### **Measuring physician coding quality to improve verbal autopsies**

**Key Words:** Infectious and Communicable Disease; Chronic Disease; Marginalized Populations; Machine Learning; Non-Communicable Diseases

**Abstract:**

*Introduction:* Verbal autopsies (VAs) are a method to ascertain cause of death (COD) when medical records are unavailable. They use questionnaires answered by close relatives/friends of the decedent, that physician coders later read to assign COD. However, no consistent method of measuring physician coding quality currently exists. The objectives of this study are to develop a method to measure physician coding quality based on approaches examined in literature review and use Health Sierra Leone (HEAL-SL) data to demonstrate the developed approach. The public health implications of this study are to inform policy makers on how to reduce preventable deaths, as higher quality VAs can inform more accurate COD statistics.

*Methodology/Principal Findings:* In this study, secondary data from the HEAL-SL data set containing deaths from 7037 adults between 2019 and 2021 was analyzed. The outcome variable was physician agreement of category of death and the variables were assessed for association using the kappa statistic, and sensitivity and specificity analysis. Furthermore, a predictive machine learning model for physician agreement was developed. The percentage of physician agreement for each disease category ranged from 22% for Cancer to 76% for Malaria. The kappa values ranged from -0.08 to 0.39 and the sensitivity/specificity values ranged from 87% to 100%. The predictive model with the highest F1 score (81%) was the XGboost model. The top im-

portance variables associated with physician agreement from this model were found to be "high certainty of physician 1&2's in assigning COD", "the decedents having an injury", and "decedents having belly pain in the lower abdomen".

*Discussion/Conclusion:* The most important variables in the model were found to be physicians' certainty and certain symptoms. Future research can focus on expanding on questions related to certain symptoms, such as belly pain, in the VA questionnaires, to help improve physician agreement.

## Shawmiga Sivakumaran

(MPH Epidemiology)

### **Occupational Noise Exposure and Incident Risk of Hypertension Among Construction Workers in the Greater Toronto Area (GTA)**

**Key Words:** Occupational Health; Non-Communicable Diseases

#### **Abstract:**

Occupational noise poses a significant health risk, particularly for blue-collar workers, with potential consequences ranging from hearing loss to cardiovascular diseases. This research addresses the growing concern of hypertension among male construction workers in the Greater Toronto Area (GTA) due to occupational noise pollution, an issue exacerbated by the expected increase in construction industry employment.

Hypertension, a major risk for cardiovascular diseases, is a common chronic condition with substantial societal implications. In Ontario, where 7.2% of the workforce is employed in construction, the need to understand and mitigate the impact of noise pollution on hypertension is urgent.

This designed study, conducted over a 10-year period, will employ a cohort design, quantitatively measuring noise exposure levels using audio dosimeters by industrial hygienists and categorized into three levels: high, intermediate, and low. Annual physician evaluations will monitor incident cases of hypertension among male construction workers aged 16-65, comparing them to office workers in the same company.

Existing research relies heavily on self-reported data and lacks longitudinal monitoring within the construction industry. By employing a rigorous quantitative approach, this study design aims to establish a clear association between occupational noise exposure and hypertension. The implications of the findings extend beyond individual health, impacting families, communities, and public health policies. The study's multidisciplinary approach ensures accessibility to a wide audience, emphasizing its relevance and potential to inform preventive strategies in addressing the global burden of hypertension among blue collar workers.

## Lauren Tailor

(PhD Epidemiology)

### **Improving Access to HIV Care for Young Mothers Living with HIV in Zimbabwe**

**Key Words:** Global Health; Infectious and Communicable Disease; Maternal and Child Health

#### **Abstract:**

*Background:* HIV disproportionately impacts adolescent girls and young women living in Southern Africa. Rates of mother-to-child HIV transmission are also elevated in this group, highlighting the need for targeted interventions to improve the health of young mothers living with HIV. A non-profit organization in Zimbabwe, Zvandiri, founded a peer-led care model, the Young Mentor Mother (YMM) program, in response to this issue.

*Methods:* Four University of Toronto students conducted semi-structured virtual interviews (N=29) among Zvandiri staff and YMMs to identify the benefits and challenges of the YMM program. We applied deductive and inductive thematic analyses to transcriptions and performed a qualitative analysis using Dedoose software.

*Results:* Participant narratives revealed several themes, including three vital benefits from the YMM program:

1) peer-support, 2) holistic care, and 3) women's empowerment. Barriers to the success of the program identified from interviews mapped onto the social-ecological model, whereby structural factors (lack of funding, food insecurity), community-level factors (HIV-related stigma, socio-cultural differences in accepting HIV care), and interpersonal factors (intimate partner violence) were found to impact the implementation and scale-up of the program. Barriers to scaling-up the YMM program included limited funds, lack of resources, and cultural and geographic differences. We also identified socio-structural challenges to scale-up, such as intimate-partner violence, food insecurity, and HIV-related stigma.

*Conclusion:* Zvandiri's YMM program fills an important gap in HIV care for young women and girls and has several benefits, such as peer-support, holistic care, and women's empowerment. Future research focused on the perspectives of clients, stakeholders, and young fathers will further inform the scaling of the program to new countries and regions.

## Tijhiana Rose Thobani

(MPH Social & Behavioural Health Sciences)

### **Caring for the Caregiver**

**Key Words:** Maternal and Child Health; Mental Health and Addictions; Social Determinants of Health

**Abstract:** Children with medical complexity (CMC) are a medically fragile subset of children who rely on parental caregivers for substantial care need. Caregivers of children with chronic illness are estimated to have increased risk of depression and anxiety, as well as PTSD. The Complex Care Program at SickKids provides a holistic approach to care, which incorporates care for children, as well as their caregiver. One of the functions of the Caring for the Caregiver Model (C4C) aims to identify anxiety and depression among caregivers, and connect these individuals with appropriate mental health supports. The project aims to support the mental health and well-being of the caregiver, which ultimately supports the well-being of the child. The model is currently being piloted within the Complex Care Program. There are currently 63 caregivers enrolled in the study, with recruitment being ongoing. Enrolled participants will have completed a total of 5 questionnaires in regards to mental health, over the course of 24 weeks. Upon completion of the 5 questionnaires, participants will be asked to engage in a qualitative interview. The aim of the study is to improve overall access to mental health care for CMC caregivers and identify current barriers to support. being of the caregiver, which ultimately supports the well-being of the child. The model is currently being piloted within the Complex Care Program. There are currently 63 caregivers enrolled in the study, with recruitment being ongoing. Enrolled participants will have completed a total of 5 questionnaires in regards to mental health, over the course of 24 weeks. Upon completion of the 5 questionnaires, participants will be asked to engage in a qualitative interview. The aim of the study is to improve overall access to mental health care for CMC caregivers and identify current barriers to support.

## Amrit Tiwana

(MPH Epidemiology)

### **Incidence of COVID-19 among workers compared to the general population of Ontario, Canada**

**Key Words:** Occupational Health; Infectious and Communicable Disease; Emergency Preparedness

#### **Abstract:**

*Background and Rationale:* The role of occupation in COVID-19 risk remains unclear, and current surveillance systems do not adequately capture both work information and COVID-19 diagnoses. This study uses the existing Occupational Disease Surveillance System (ODSS) to examine the association between occupation and COVID-19 incidence.

*Methods:* This study followed previously injured workers with accepted lost-time claims for COVID-19 diagnoses from February 1, 2020, to December 31, 2021. Workers were followed until age 65 years, death, or emigration out of Ontario. COVID-19 diagnoses were identified using ICD-10-CA diagnostic codes in the Discharge Abstract Database and National Ambulatory Care Reporting System. Standardized incidence ratios (SIRs) and corresponding 95% confidence intervals (CIs) adjusted for age, sex, and calendar month were calculated to

# Dalla Lana

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compare COVID-19 risk among workers to the general Ontario population.

*Results:* The cohort consisted of approximately 1.2 million workers, predominantly male (67.13%), residing in Central East and Central West of Ontario (50.30%), and aged 55 to 65 years (42.90%). In total, 10,322 COVID-19 cases were identified through hospital records. Compared to the general population, workers had a higher risk of COVID-19 hospitalizations (SIR=1.21, CI95%=1.18-1.26) and emergency department visits (SIR=1.29, CI95%=1.27-1.31). Occupations with a higher risk of hospitalizations were healthcare (SIR=1.47, CI95%=1.30-1.67); materials handling (SIR=1.45, CI95%=1.45, 95% CI=1.28-1.64); and food, wood, and textile processing (SIR=1.38, CI95%=1.18-1.62). Industries with a higher risk of hospitalizations were community, business, and personal service (SIR=1.41, CI95%=1.33-1.50); manufacturing (SIR=1.33, CI95%=1.26-1.41); and transportation and communication (SIR=1.24, CI95%=1.11-1.37). Findings were similar for emergency department visits.

*Implications:* Findings support the hypothesis that occupation may play a role in COVID-19 risk. Elevated risks observed among ODSS workers suggest that prevention strategies should be targeted toward high-risk occupations. Understanding occupational COVID-19 incidence can inform public health policies and workplace safety measures to protect workers, businesses, and broader communities during infectious disease outbreaks.

## Savannah Torres-Salbach

(MPH Social & Behavioural Health Sciences)

### **Perspectives of perinatal participants who have discontinued brief behavioral activation treatment: Insights from the SUMMIT Trial**

**Key Words:** Maternal and Child Health; Mental Health and Addictions

#### **Abstract:**

*Objective:* Approximately 10-20% of women experience symptoms of depression and anxiety during the perinatal period; however, less than one-fourth receive effective mental health treatment due to various personal and structural barriers to care. In this study, we examine the reasons why perinatal women with symptoms of depression and anxiety who participated in a psychotherapy clinical trial chose to discontinue treatment. The objective is to understand some of the personal and structural barriers this population experiences when trying to access care.

*Methods:* We performed a qualitative, descriptive study. We conducted semi-structured interviews with a convenience sample of 18 perinatal participants who participated in the Scaling Up Maternal Mental healthcare by Increasing Access to Treatment (SUMMIT) trial and decided to discontinue their treatment. We performed a content analysis to identify the most commonly endorsed themes for reasons behind treatment discontinuation.

*Results:* The most highly endorsed reasons for discontinuation included: transportation challenges (n=13, 72.2%), arrangement of childcare (n=11, 61.1%), a dissatisfaction in their assigned treatment modality or provider type assignment (n=11, 61.1%), work-family conflict (n=6, 33.3%), feeling overwhelmed (n=6, 33.3%), and health concerns or risks (n=6, 33.3%). Participants also expressed that a dissatisfaction with the content or structure of behavioral activation (n=5, 27.8%) and the timing of treatment (received in pregnancy vs. postpartum) (n=4, 22.2%) contributed to their discontinuation.

*Conclusion:* Our findings provide insights on the personal and structural barriers perinatal individuals experience in accessing treatment in the context of a research setting. Perinatal participants expressed a preference for virtual mental healthcare for its convenience, demonstrating a feasible way to reduce some of the barriers to care.

## Snigdha Velugu

(PhD Social & Behavioural Health Sciences)

### **Uncovering Menstrual Experiences of Slum-dwelling Menstruators in Hyderabad, India**

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In India, menstrual experiences are shaped by a combination of deep-rooted cultural norms and emergent socio-political discourse, capturing a spectrum from taboos and stigmas to empowerment and the quest for bodily autonomy and agency. Beyond this complex menstrual narrative, several other factors shape the menstrual experiences of menstruators living in India's slums. These include spatial congestion, financial uncertainty, concerns about personal safety, communal tensions, and limited water resources. By 2050, urbanization is expected to raise global slum populations six-fold and double India's. The rapid urbanization in India is straining the government's capacity to provide basic amenities like housing, sanitation, electricity, and water. This significantly affects the ability of menstruators in the slums to tend to their bodies with comfort, confidence, and safety. Menstruation is not merely a matter of hygiene and dignity. It's also a social determinant of sexual and reproductive health and rights, influencing vital life events that determine the overall health and well-being of menstruators. Rooted in the lived experiences of menstruators, my proposed research aims to uncover the multifaceted influences on menstrual experiences in Hyderabad's slums. Guided by biopolitics and poststructuralist feminism, I will take a critical-participatory approach to identify and unpack the factors that shape the menstrual experiences of slum-dwelling menstruators. The novelty of my study is predicated on the use of a multi-method critical qualitative study design that integrates participatory and arts-based methodologies into critical ethnography using complete-the-story, a participatory interview strategy and digital storytelling. My study's findings will (1) highlight the sociocultural, socio-political and geographical factors affecting menstruator's health and their bodily autonomy and agency and (2) inform future menstrual hygiene management strategies implemented by India's state and national government, NGOs, and academics, ensuring they account for the contextual needs of menstruators when crafting policies and programs.

## Linke Yu

(MPH Epidemiology)

### **Assessment of Maternal and Infant Health Status in Durham Region**

**Key Words:** Maternal and Child Health; Knowledge Translation; Non-Communicable Diseases

**Abstract:** I completed my practicum as a Student Epidemiologist at the Durham Region Health Department with the Health Analytics and Research Team (HART). HART is tasked with conducting population health assessments in Durham Region. As a member of HART, I played a critical role in assessing the maternal and infant health status of the local population using data from the BORN information system. Specifically, my primary responsibilities included data extraction and data coding, which encompassed a series of tasks, spanning from data cleaning to data analysis in STATA. Through analyzing BORN data, I was able to refine my statistical and programming skills. Moreover, I collaborated with public health program staff to develop infographics aimed at disseminating critical maternal and infant health information to various communities. The infographics I assisted with covered a wide range of maternal and infant health topics, including issues such as gestational diabetes and maternal mental health concerns. I was able to effectively communicate health information in a concise and understandable manner. In addition, I had the opportunity to attend various public health workshops and group meetings during my practicum. These experiences not only expanded my knowledge of diverse public health topics but also afforded me greater familiarity with the public health practice. In summary, my time at the Durham Region provided me with an exceptional opportunity to apply the knowledge I gained in school to real-world practice. It was a valuable and enriching experience that significantly contributed to my professional development in the field of public health.

## Stephanie Ziembicki

(PhD Occupational & Environmental Health)

### **Updating the CAREX Canada diesel engine exhaust job-exposure matrix with published measurement data**

**Key Words:** Occupational Health; Prevention

**Abstract:**

*Background:* Diesel engine exhaust (DEE), a lung carcinogen, is one of the most common occupational exposures. The CAREX DEE job-exposure matrix (JEM) is one Canadian exposure assessment tool for DEE. The CAREX DEE JEM was created with heavy reliance on expert judgement due to a lack of exposure data at its



inception. It is important to have exposure assessment tools that accurately reflect current workplace exposure conditions. The objective of this study was to update the CAREX Canada DEE JEM algorithmically using published data to better reflect current scientific knowledge.

*Methods:* The literature was searched for occupational exposure studies that measured DEE in elemental carbon (EC) between January 2010-May 2022, reflecting the period since the CAREX JEM was last updated with exposure studies. Four-digit North American Industry Classification System (NAICS) 2002 and National Occupational Classification-Statistics (NOCS) 2006 codes were assigned to each identified occupational subgroup from the studies. EC exposures were categorized as low (0-10 $\mu\text{g}/\text{m}^3$ ), medium (10-20 $\mu\text{g}/\text{m}^3$ ), or high (>20 $\mu\text{g}/\text{m}^3$ ). An algorithm, considering the number of studies, workplace locations, and sample size, was designed to assign exposure levels to identified groups by NOCS.

*Results:* Thirty-seven studies were identified from the published literature reporting on 53 unique industry-occupation intersections (20 NAICS and 34 NOCS codes). The algorithm increased the exposure level of 12.5% of the JEM (286,710 workers) (15.8% of DEE-exposed workers), most in construction and mining. Heavy equipment operators (n=82,680) and construction trades helpers and labourers (n=135,010) in construction and mining were the largest occupation groups affected by the update, mostly classified as moderately exposed.

*Conclusions:* This study describes a systematic approach for updating an existing JEM to incorporate new scientific knowledge in a reproducible way. The updated JEM better reflects exposure in industries, particularly construction. Future analyses include its use as an exposure assessment tool in occupational epidemiology.