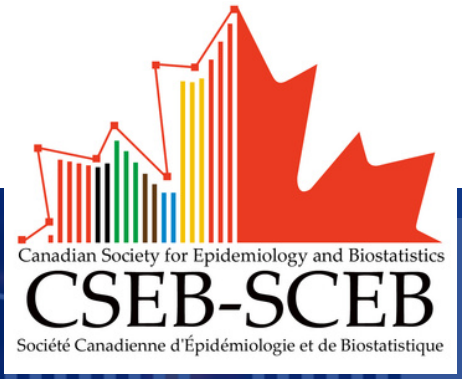
2025 CSEB CONFERENCE

BOOK OF POSTERS



Poster Abstracts

This document contains the most up to date abstract information as provided by the author(s).

Measuring sarcopenic obesity in older adults: development of age and sex-specific fat mass to fat-free mass ratio (FM/FFM) percentile curves using data from the Canadian Longitudinal Study on Aging

Background: Fat mass to fat-free mass ratio (FM/FFM) has been suggested as a potential measure of sarcopenic obesity, an important health issue without established definitions. Having a high FM/FFM value relative to the average population might indicate the presence of sarcopenic obesity. Objectives: To develop age- and sex-specific FM/FFM percentile curves for older adults as a measure of sarcopenic obesity. Methods: Baseline data from the Canadian Longitudinal Study on Aging Comprehensive cohort were used (n=28,791). FM/FFM was calculated as the ratio of total body fat mass (kg) to total body lean mass (kg) from Dual-Energy X-ray Absorptiometry (DXA) scan. Age and sex-specific FM/FFM weighted percentile curves for the 1st, 5th, 25th, 50th, 75th, 95th, and 99th percentiles were calculated using the LMS method. LMS provides a summary of the changing distribution of the measurement of interest by the three curves, lambda for the skewness (L), mu for the median (M), and sigma for the coefficient of variation (S). The weighted percentile curves were then plotted with age on the x-axis and FM/FFM on the y-axis for males and females, respectively. Results: The maximum FM/FFM was approximately 0.77 at age 70 for males and approximately 1.14 at age 66 for females. The median FM/FFM values in the same age ranges were approximately 0.41 and 0.70 for males and females, respectively. For both groups, FM/FFM tended to increase until 65-70 years of age and decreased thereafter. Females experience increases in FM/FFM at earlier ages and decline at faster rates than males. Conclusion: On average, males tended to have lower FM/FFM and had generally slower decline in FM/FFM than females. These patterns are similar to previous findings among older adults from US and China. Further research on sex differences in sarcopenic obesity among older adults is warranted.

Chris Kim, University Of Toronto

Impact of Osteoarthritis and Back Problems on Health Outcomes in Canada – Findings from the Canadian Longitudinal Study on Aging

Background: Both osteoarthritis (OA) and low back pain are large contributors to the global burden of disability and to health care use through common symptoms that lead to pain and disability. Objectives: To investigate whether individuals who report both OA and back problems report poorer health outcomes than those who have either condition alone. Methods: This cross-sectional study uses data from the baseline Tracking Cohort of the Canadian Longitudinal Study on Aging. Participants (n=14,024) aged 45-85 (mean age 63.1) responded via a questionnaire. Exposure variables: OA and back problem status. The outcome variables assessed included quality of life (pain, disability), health impact (including self-rated general health), and health care use. Robust Poisson regression models, adjusting for sociodemographic factors, obesity and comorbidity count, were used to assess the association between OA+back, OA alone, and back alone (reference: neither) and each health outcome. Results: In total, OA and/or back problems were reported by 37%: OA+back 6%, OA alone 16%, back alone 15%. The OA+back and OA alone groups had a higher proportion of females and were slightly older. Prevalence ratios showed that those with OA+back had worse outcomes than those with OA alone: moderate/severe pain [2.98 (2.70,3.29) vs 2.19 (2.00,2.39)], disability [3.80 (3.41, 4.23) vs 2.81 (2.54, 3.10)] and worse general health [1.89 (1.63, 2.19) vs 1.25 (1.08, 1.44)]. Findings for those with back problems alone were similar to those for OA alone. For all OA and/or back problem groups, the risk of adverse outcomes were higher than those for those with neither of these conditions. Conclusion: Those with concomitant OA and back problems appear to be at risk of experiencing poorer health-related and overall quality of life than those with either problem alone. As nearly one-third of those with OA reported back problems, their co-occurrence warrants research, clinical and public-health attention.

Monica Prajapati, Ontario Health, Practice Level Measurement Analyst

Functional social support as a mediator of the association between anxiety and executive function in middle-aged and older adults

Background: Anxiety in older adulthood may adversely affect executive function, a cognitive domain essential for adaptability and independence. Functional social support (FSS), the perception that others will provide help, care, or comfort when needed, may partially explain the link between anxiety and executive function. This link may differ by age or sex. Objectives: To examine whether FSS mediates the association between anxiety (clinical diagnosis or anxiety symptoms) and executive function in middle-aged and older adults, stratified by age and sex. Methods: Analyses included 6,719 community-dwelling adults aged 45 to 85 years at baseline, drawn from the Comprehensive cohort of the Canadian Longitudinal Study on Aging. Data were collected over six years. Clinical history of an anxiety disorder (yes/no) and anxiety symptoms (four items from the Kessler Psychological Distress Scale) were self-reported at baseline. Three-year FSS was self-reported using the Medical Outcomes Study-Social Support Survey. Six-year executive function was obtained by standardizing and combining scores from five neuropsychological tests. Conditional process analysis with percentile bootstrapping was used to estimate mediation across levels of age and sex, adjusted for relevant covariates and antecedent measures of FSS and executive function. A sensitivity analysis repeated the main analyses using multiple imputation of covariates to test the robustness of the findings. Results: FSS did not significantly mediate the association between either anxiety measure and executive function for any age or sex subgroup (b's = -0.0043 to 0.0103, p > .05). The analysis of imputed data produced similar results (b's = -0.0033 to 0.0042, p > .05). Conclusion: While social support has known benefits for cognition, our results suggest the provision of FSS may not be an effective strategy to mitigate anxiety's impact on executive function. Interventions may be better directed to other pathways to promote the cognitive health of anxious older adults.

Cindy Wang, University of Waterloo

Prevalence of Total Knee Replacement for Knee Osteoarthritis in Ontario, Canada: An age-period-cohort analysis

Background The incidence of total knee replacement (TKR) in Canada tripled from 2001 to 2020, with over 75,000 procedures in 2019/2020 costing over $750 million. Over 99% of the TKRs are performed to treat knee osteoarthritis. Limited attention has been paid to the prevalence of TKR – the number of people living with a TKR – and its association with time-related and health utilization factors. Objectives Our goal was to investigate the complex contribution of time-related effects on trends in TKR prevalence estimates and whether observed effects are associated with health utilization factors (i.e., predisposing, enabling, and need factors). Methods We used 2003–2014 data from the Canadian Community Health Survey (adults aged 50 and older, n = 97, 443) linked to health administrative data to ascertain the 10-year prevalence of TKR. We estimated the age-period-cohort effects on the 10-year prevalence of TKR using log-binomial hierarchical age-period-period cohort models. We analyzed whether observed effects are associated with health utilization factors (e.g., arthritis, BMI, sex, education, rurality, income). Results Adjusting for these factors, each one-year increase in age above the sample mean was associated with a 4% higher prevalence of TKR (PR: 1.04, 95% CI: 1.03, 1.06). The period and birth cohort effects were non-linear and not statistically significant overall. Self-reported arthritis (PR: 4.70, 95% CI: 4.22-5.23) and obesity (compared with normal BMI, PR: 3.39, 95% CI: 3.02-3.80) had the strongest association with the prevalence of TKR, but only slightly attenuated time-related factors. Conclusion The prevalence of TKR is primarily driven by aging and arthritis/obesity burden, with minimal influence from period and birth cohort effects, highlighting the need for continued upstream public and population health approaches to minimize the incidence of arthritis in the population.

Tristan Watson, University of Toronto, PhD Candidate

Dimensionality Reduction Methods to Investigate Multimorbidity Using Administrative Health Data or Electronic Health Records: A Scoping Review

Background: Multimorbidity, the co-occurrence of two or more chronic health conditions, continues to increase in Canada and drives healthcare utilization. Administrative health data and electronic health records (EHRs) are widely used to explore multimorbidity, but the complexity of these data can obscure multimorbidity patterns. Combining data from multiple sources like hospital and prescription drug records, could lead to more accurate insights into multimorbidity clusters and their progression. Dimensionality reduction methods can transform complex high-dimensional data into a parsimonious set of features and identify clinically meaningful patterns. Application of these methods to administrative health data or EHRs can be challenging while addressing data sparsity and missingness. Objectives: We conducted a scoping review to systematically identify and summarize dimensionality reduction methods for identifying multimorbidity patterns in administrative health data or EHRs. Methods: Peer-reviewed articles were included following comprehensive searches in MEDLINE, EMBASE and Scopus from inception until September 15, 2024. Two reviewers independently screened all titles/abstracts and full-texts using pre-specified inclusion/exclusion criteria. Data extraction included characteristics of the articles (country, publication year), study purpose and population (e.g., study size, number of chronic conditions), dimensionality reduction methods (e.g., data source and structure, techniques to address temporality, biases adjustment techniques related to sparsity, disease prevalence imbalance, delayed diagnosis), and approaches to assess face validity of observed multimorbidity patterns. Results: Of the 1,210 identified articles, 714 underwent title/abstract screening, followed by full-text screening of 43 articles. A total of 21 articles were retained for review. Preliminary results indicate EHRs are a common data source (n=14). Matrix and tensor factorization (n=6), exploratory factor analysis (n=5), and auto-encoder-based (n=4) methods were common dimensionality reduction methods. Temporal sequences were studied in eight articles. Conclusions: Ongoing data extraction and citation tracking will provide insights into best practices and guidelines for application of dimensionality reduction methods in multimorbidity research.

Nasiba Ahmed, Data Science Platform, George & Fay Yee Centre for Health Care Innovation, University of Manitoba

The test-negative design for the estimation of COVID-19 vaccine effectiveness: development of statistical methods in the evolving context

Background: The test-negative design (TND) has been widely used for the rapid estimation of vaccine effectiveness against infectious diseases. The TND typically includes individuals with a common symptom profile who are receiving a laboratory test for an infection of interest. Among them, participants who test positive for the target infection are “cases” and those who test negative are “controls”. Existing statistical approaches developed for the TND are based on a single time frame and have certain limitations in a dynamic longitudinal setting, where data can be periodically collected from different individuals over the study period. First, time-dependent confounders may be influenced by previous vaccination and health status, such as previous infection, while also affecting the subsequent vaccination decisions. Thus, the causal relation of interest cannot be properly estimated using traditional covariate-adjusted models. Secondly, since individuals can test positive multiple times over the study period, past infections may alter immunity, complicating the disease progression, and creating non-positivity for vaccination in the subsequent time periods. Objective: To propose a formal causal framework that accounts for the time-varying effects as well as changing risk sets, particularly in the context of the dynamic nature of infectious diseases. Methods: We propose IPTW estimators of discrete-time hazard and hazard ratios for the general population, which can be shown identifiable from the TND samples. Simulation studies are conducted to evaluate the performance of these estimators. Results: The proposed IPTW estimators provide unbiased estimates of vaccine effectiveness for the general population under a dynamic longitudinal setting. Conclusion: Our study clarifies which causal effects can be estimated under a dynamic longitudinal TND and how to estimate these effects.

Helen Bian, McGill University

Positivity assumptions in mediation analyses? Checked!

Background: Identifying the mechanisms by which an exposure or treatment affects an outcome is common in epidemiology. Mediation analyses are usually used for investigating such mechanisms. Among the assumptions underlying causal mediation analyses, positivity is unfortunately seldom mentioned, perhaps due to the lack of tools for checking it. Objectives: This work sought to develop a tool for diagnosing positivity violations for both the exposure and the mediator. Furthermore, for natural mediation effects, the positivity assumption needs to be checked for the range of the mediator values under the opposite value of the exposure due to the cross-world potential outcomes involved. Methods: We propose an extension of the Positivity Regression Trees (PoRT) algorithm, which was recently designed to check positivity for total treatment effect estimation settings without requiring assumptions about the modelling nor the data-generating process. Results: Both simulations and a real-life application in mental health illustrate the challenges of checking non-positivity in mediation analysis and the use of the proposed algorithm to circumvent them. Conclusions: PoRT provides a transparent way to identify the individuals and variables yielding a lack of positivity. Its use in practice is facilitated by an open-access implementation in R and a related notebook.

Arthur Chatton, Université de Montréal, Assistant professor

Missing Data in Pragmatic Trials: A Simulation-Based Study

This project evaluates how trial design and missing data mechanisms affect treatment effect estimation in simulated pragmatic trials. A synthetic population of individuals with type 2 diabetes receiving semaglutide was used to simulate randomized controlled trials under two sampling strategies: more pragmatic (broad eligibility) and more explanatory (restrictive eligibility). Missing outcome data were introduced under MCAR, MAR, and MNAR mechanisms at 5%, 15%, and 25% levels. Three methods—Complete Case Analysis (CCA), Multiple Imputation (MI), and Maximum Likelihood Estimation (MLE)—were applied to 1,000 simulated trials. Findings suggest that more pragmatic designs tended to yield lower bias and more stable coverage, particularly under MNAR. For example, under 25% MNAR missingness, the bias for CCA was 1.73 (more pragmatic) vs. 2.08 (more explanatory), for MI was 2.29 (more pragmatic) vs. 2.6 (more explanatory), and for MLE was 1.56 (more pragmatic) vs. 1.9 (more explanatory). Under MAR, pragmatic designs mostly showed improved performance in MI and MLE but not always in CCA. However, under MCAR, more explanatory trials often demonstrated slightly better performance, particularly in bias reduction. These differences emphasize that trial design interacts with missing data mechanisms in complex ways. Across all methods and trial designs, increasing missing data from 5% to 25% led to higher bias and MSE. MNAR had the most severe impact on estimator performance, followed by MAR and MCAR. These findings highlight the importance of choosing robust analytical methods for handling missing data.

Bahareh Kheiri, Western University

Emulating Target Trials to Examine the Effect of Prenatal Exposures on Offspring Health Outcomes: Important Considerations for Estimating Causal Effects

Background: Medication use in pregnancy is common with an estimated 90% of pregnant individuals exposed to medications during pregnancy. However, pregnant people are often excluded from randomized controlled trials, leaving clinicians and patients reliant on evidence from observational data, which can be vulnerable to biases that limit causal inference. To overcome these limitations, contemporary approaches, including the target trial emulation (TTE) framework, are increasingly used to design causal studies that mimic pragmatic clinical trials using observational data. The TTE approach explicitly defines study parameters, aligns eligibility criteria to a relevant time zero, and uses advanced methodological techniques (e.g., propensity score weighting) to emulate random assignment, minimizing many biases inherent in observational research. Studies of prenatal exposure and offspring health outcomes must contend with multiple competing events and are vulnerable to selection bias, making the TTE approach particularly beneficial; however, its application in this area is under-explored. Methods: As an example, we discuss the use of TTE to examine the effect of prenatal antipsychotic exposure on offspring obesity, as well as mitigation strategies for potential biases specific to emulating trials on prenatal exposures and offspring outcomes: (1) dynamic exposures (i.e., sustained medication use), (2) multiple time scales (i.e., maternal age, gestational age), (3) competing events (i.e., pregnancy loss), and (4) linkage and coverage restrictions. Results: N/A Conclusion: Our goal is to outline how the TTE approach can improve causal inference and inform clinical decisions with the end goal of improving offspring health outcomes.

Lauren Tailor

Trends in Breast Cancer Screening Among Women in Rural and Urban Areas of the United States from 2018 to 2022

Background: Breast cancer (BCa) is the most common cancer among U.S. women, and early detection is vital. Despite screening programs (mammography), disparities persist between urban and rural areas due to socioeconomic, demographic, and lifestyle factors. Objective(s): To analyze mammography trends among U.S. women aged 50- 74 from 2018-2022, identifying urban-rural disparities. Methods: Data from the BRFSS (2018-2022) included 314,302 women aged 50-74 from urban and rural areas. Cluster sampling and weighting ensured representativeness. Logistic regression modelled mammography uptake through includes demographic, insurance, and lifestyle factors. Results: The annual mammography screening rates for women aged 50-74 from 2018 to 2022 showed statistically significant trends over the five-year period ($p<0.001$), with urban women consistently having higher rates than rural women. Disparities were associated with factors like marital status, race, income level, health insurance coverage, education level, and smoking habits. African American women had significantly higher odds of undergoing mammography screening compared to Caucasian women (OR = 1.81, 95% CI [1.67, 1.97]). In contrast, Indigenous American (OR = 0.81, 95% CI [0.67, 0.98]) and Asian women (OR = 0.76, 95% CI [0.61, 0.93]) exhibited lower screening rates. Additionally, women without health insurance (OR = 0.28, 95% CI [0.25, 0.30]) and those who smoked (OR = 0.55, 95% CI [0.51, 0.58]) were less likely to undergo mammographic screening. Conclusion: Addressing factors negatively influencing a woman's decision to have a mammogram is crucial for early detection and reducing mortality. Targeted interventions, increased insurance coverage, and community outreach are recommended to enhance access and reduce inequities.

Saber Amirzadeh Googhari

Association between human papillomavirus and prostate cancer: A systematic review and meta-analysis

Background/objective: Human papillomavirus (HPV), the necessary cause of cervical cancer, is also causally associated with other anogenital cancers. HPV's role in prostate carcinogenesis remains controversial. We synthesized and meta-analyzed the epidemiological literature on the association between HPV and prostate cancer. Methods: We completed a systematic search of Embase, MEDLINE, Scopus, and Cochrane on January 31, 2025, to identify peer-reviewed empirical studies investigating the association between HPV and prostate cancer. Two reviewers independently screened the studies and extracted data on study design, population and sample characteristics, HPV and prostate cancer ascertainment methods, and key findings. Extracted data was cross-validated by a second co-author. For our primary meta-analysis, we used a random effects model to pool risk estimates for studies that detected HPV DNA in prostate tissue. We also pooled results by HPV oncogenic potential and by genotype. Results: Our search identified 958 unique records, of which 84 (published 1990-2025) were included. Most studies were cross-sectional (n=57: 3,022 cases and 2,965 controls), 15 were case-control, and six were nested case-control (14,241 cases and 23,612 controls), and six were cohort (two registry-linked, two retrospective, one prospective, one longitudinal). HPV detection methods were HPV DNA (n=57); HPV serology (n=17); self-report (n=5); chart review, registry or claims data (n=4); HPV RNA (n=3); and immunohistochemistry (n=2). HPV prevalence was generally below 20% among studies (59.5%). Our primary meta-analysis of 33 studies (27 cross-sectional and 6 case-control) resulted in a pooled odds ratio (pOR) of 2.39 (CI: 1.92-2.99). For high-risk HPV types, the pOR was 2.68 (CI: 1.70-4.23). Specific HPV genotypes were also associated with an increased odds of prostate cancer: HPV16 (pOR: 2.28, CI 1.18-4.40), HPV18 (pOR: 2.37, CI 1.16-4.87), and HPV33 (pOR: 3.73, CI 0.46-30.30). Conclusion: Our results support a significant association between the presence of oncogenic HPV DNA in prostate tissue and prostate cancer.

Sarah Botting-Provost, McGill University , PhD student

Review of network meta-analyses on the efficacy of chemopreventive agents on colorectal adenomas and cancer

Background: Colorectal cancer (CRC) is the third most diagnosed cancer and the second leading cause of cancer-related death worldwide. Colorectal adenomas (CRAs) are a precursor for CRC. Several studies have examined the effects of chemopreventive agents (CPAs) on reducing CRA/CRC incidence. Network meta-analyses (NMAs) of randomized controlled trials (RCTs) are the highest level of evidence for comparing multiple interventions in evidence-based medicine. Several NMAs have been published on chemoprevention of CRA/CRC. The overall efficacy of CPA and the quality of these NMAs have not been assessed. Objectives: Our study reviewed the efficacy and safety of CPAs on CRA/CRC evaluated in NMAs of RCTs and assessed the quality of all published NMAs on CPAs. Methods: We searched PubMed, Embase, and Cochrane Library for studies published from inception to July 29, 2024. We included all NMAs assessing the efficacy and safety of CPAs on CRA/CRC in average-risk (general population) and high-risk (previous history of adenoma/CRC) populations. Results: Nine NMAs comparing 15 different interventions were included. Aspirin and non-aspirin non-steroidal anti-inflammatory drugs (NA-NSAIDs) were the most studied. Aspirin demonstrated efficacy against the development of any CRA and low-dose aspirin was consistently more protective than high-dose aspirin. The effect of aspirin against advanced CRA was not statistically significant. While concerns for long-term aspirin use included an increased risk of gastrointestinal bleeding and ulceration, aspirin users did not have an increased risk of serious adverse events (SAEs), compared to controls. NA-NSAIDs showed better efficacy against advanced CRA, however, the use of NA-NSAIDs was associated with significantly increased risk of SAEs, particularly cardiovascular diseases. Conclusion: Considering the balance of efficacy and safety, low-dose aspirin is currently the best option for chemoprevention of CRA/CRC. Future research is needed to better characterize the patient subgroups that benefit most and to develop new, more effective CPAs.

Chantelle Carbonell, University Of Calgary

Next generation weight loss drugs could prevent millions of cancers in the United States over the next 25 years

Background: After tobacco consumption, excess body size is the most impactful factor in population-level cancer risk, being associated with at least thirteen cancer sites. Despite the known role of obesity in chronic diseases and many cancers, excess body size has been steadily rising for the past 40 years in western populations, including the United States (US). Recent randomized trial and real-world data suggest that next-generation weight loss drugs (NGWLD), including glucagon-like peptide-1 receptor agonists (GLP-1RAs), may help combat obesity-associated cancers. Objectives: To estimate the potential impact of GLP-1RAs on reducing the incidence of obesity-related cancers in the US. Methods: We obtained the projected cancer incidence data (2025-2050) from GLOBOCAN. Relative risks for body mass index (BMI) and cancer were extracted from the American Institute for Cancer Research Continuous Update Project. We modeled BMI distribution by sex based on National Health and Nutrition Examination Survey data (2021-2023). We estimated preventable obesity-related cancers from a 10% weight reduction based on GLP-1RA trial data. Results: In 2021-2023, the prevalence of overweight and obesity was 36.2% and 39.5% among males and 28.8% and 41.4% among females aged ≥20 in the US. In 2025, the projected incident cases for all obesity-associated cancers were about 303,600 (males) and 538,600 (females). By 2050, these numbers are projected to increase by 31% to 397,400 (males) and 24% to 669,100 (females). With a 10% GLP-1RA-related weight reduction, about 5.6% male and 6.4% female obesity-related cancers could be avoided annually between 2031 to 2050, amounting to an estimated 1.23 million cases (414,700 in males, 811,500 in females). Conclusion: The re-purposing or widespread use of GLP-1RAs among those with high BMI could meaningfully reduce obesity-associated cancers in the US. While pharmacological intervention is not the ideal solution, left unchanged, the number of obesity-associated cancers will continue to rise.

Chantelle Carbonell, University Of Calgary

Causes of death among individuals diagnosed with head and neck cancer in Canada, 1992-2015: A population-based cohort study

Background: Individuals diagnosed with head and neck cancer (HNC) face elevated mortality risk due to the disease's aggressive nature, treatment complications, recurrence, secondary malignancies, functional impairments, and effects of oncological interventions. Objectives: To determine leading causes of death among Canadians diagnosed with HNC (1992-2015) and compare mortality risks to the general Canadian population. Methods: We identified Canadians diagnosed with HNC from the Canadian Cancer Registry, using the International Classification of Diseases for Oncology, 3rd Edition (C00-C14 and C30-C32.9). Cause-of-death data was obtained by linking records to the Canadian Vital Statistics Database for the period 1992–2015. To compare mortality risks of HNC patients to the Canadian general population, we calculated standardized mortality ratios (SMRs), standardized by sex and age. Using Poisson regression, we identified risk factors for mortality among individuals with HNC. Results: Between 1992-2015, 97,655 Canadians were diagnosed with a HNC, mostly in the oropharynx (22.1%), oral cavity (21.8%) and hypopharynx, nasopharynx or larynx (37.6%). During the study period, 57,895 patients died. The leading causes of death were neoplasms (71.5%), heart diseases (8.2%), and chronic lower respiratory diseases (2.8%). HNC patients had two-times higher risk of death compared to the Canadian general population. Additionally, HNC patients had elevated risk of death from cancer (SMR: 5.45, 95% CI: 5.38-5.52), and suicide (SMR: 1.44, 95% CI: 1.19-1.70). Among HNC patients, mortality was higher among males, those diagnosed at older ages, and during the first five years after diagnosis. Urban versus rural residence was not associated with mortality. There was a markedly reduced in mortality in recent diagnosis cohorts. Conclusion: HNC patients face elevated mortality risk from cancer and suicide compared to the general Canadian population. These findings demand intensive survivorship care integrating rigorous cancer surveillance, comorbidity management, and targeted mental health interventions.

Theerthika Dillibabu

Determinants of adiposity in patients with breast cancer

Excess body weight is associated with higher incidence and worst prognosis of breast cancer, and breast cancer patients are at higher risk of gaining weight after diagnosis. To identify modifiable factors that can affect body weight of women with breast cancer, we used prospectively collected data from consecutive breast cancer patients (biobank of a breast cancer reference center), including factors that may influence body weight and composition (telephone interview), dietary intakes (DHQ-II) and adiposity (anthropometric measurements and mammary adipocyte cell size). We summarized relationships between determinants of adiposity identified in the literature in a directed acyclic graph, conducted a principal component analysis to capture dietary intakes from major nutrients and univariate and multivariate regression models to estimate the association of each factor with each adiposity measure. While menopausal status, ever smoking, tumor grade and higher weight at 18 years old were consistently associated with higher adiposity measures, higher animal fat intakes was consistently associated with higher body mass index (BMI) and high educational attainment with lower BMI and waist-to-height ratio, in both univariate and multivariate models. Higher physical activity was associated with lower adiposity measures and adipocyte cell size, whereas higher age was associated with higher adiposity measures and adipocyte cell size only in univariate models. Only menopausal status was associated with higher mammary adipocyte cell size in both univariate and multivariate models. These results indicate that although excess body weight is a complex condition, some key modifiable factors can be targeted to reduce its burden among breast cancer patients.

Kaoutar Ennour-Idrissi, Université Laval, MD, MSc, PhD candidate

Hormone receptor and epidermal growth factor receptor 2 status in breast cancer: associations with classical risk factors

BACKGROUND: Breast cancer molecular subtypes (BC) present distinct incidence, prognosis and response to treatment suggesting their etiology may be unique. OBJECTIVES: Examine the association between risk factors and BC molecular subtypes: Luminal A (LA), Luminal B (LB), HER2+ and Triple Negative (TN). METHODS: The study included two cohorts of women with infiltrating primary breast cancer diagnosed between 2000 and 2019 (n=11,920) and between 2000 and 2012 (n=6,775), treated at the Centre des Maladies du Sein (CMS) of the Centre Hospitalier Universitaire (CHU) of Quebec-Laval University. Molecular subtypes were classified by immunohistochemistry. Prevalence ratios (PR) were calculated using multivariable log-binomial regressions with SAS software. RESULTS: Various risk factors were differently associated with breast cancer molecular subtypes, such as patients' age at diagnosis (patients aged between 60-69 years: PR=1.26, 95% CI: 1.18-1.34 for LA; PR=0.49, 95% CI: 0.40-0.64 for LB; PR=0.43, 95% CI: 0.28-0.65 for HER2+ and PR= 0.40, 95% CI: 0.28-0.48 for TN) weight (underweight patient: PR=0.87, 95% CI: 0.79-0.96 in LA tumors; obese women: PR=1.45, 95% CI: 1.14-1.83 for LB) and oral contraceptives (OC) use. Past OC use was associated with increase prevalence of both LA and LB tumors (PR=1.16, 95% CI: 1.10-1.22 and PR=1.50, 95% CI: 1.20-1.87, respectively) while current OC use was associated with decreased prevalence of LA (PR=0.76, 95% CI: 0.69-0.84). Menopause (PR=1.53, 95% CI: 1.22-1.93), past hormone replacement therapy use (PR=1.43, 95% CI: 1.10-1.86), and having a first full-term child before the age of 20 (PR=1.62, 95% CI: 1.14-2.29) were associated with an increased prevalence of TN. CONCLUSION: This first exploratory study in Quebec highlights the etiological heterogeneity among breast cancer molecular subtypes and could help develop subtype-specific prevention strategies for the Quebec population. For instance, maintaining a healthy weight could prevent the occurrence of the LB subtype, an aggressive form of breast cancer.

Haroun Ouerdia, hopital saint sacrément chuq, professionnelle de recherche

Treatment strategies and survival outcomes for invasive breast cancer in real-world clinical settings over time: A systematic review of observational studies

Background: Significant advances have transformed the clinical management of breast cancer (BC), which has become complex. However, real-world data on treatment patterns and their impact on survival remain limited. Objectives: This review aims to provide a comprehensive overview of these treatments' effects on survival in clinical practice over time. Methods: Studies were identified through PubMed, EMBASE, and Web of Science up to April 2024. Prospective and retrospective cohort studies of women with non-metastatic invasive BC reporting on overall survival (OS), disease-free survival (DFS), or invasive-disease-free survival (iDFS) regarding systemic treatments were included. Results: Twenty-five studies, mostly retrospective (96%), with 74,775 patients from 2011 to 2024, were included. Treatments compared included chemotherapy (76%), endocrine therapies (60%), and anti-HER2 therapies (16%). Survival outcomes varied based on treatment type and patient age. Chemotherapies, mainly taxane and anthracyclines showed no statistically significant differences in OS, DFS, or iDFS in the neoadjuvant or adjuvant sequences, except for platinum-base chemotherapy which improved DFS in BRCA1 mutation carriers (96% vs. 75.2%, p=0.01). For endocrine therapies, the combination of aromatase inhibitor (AI) and ovarian function suppression (OFS) showed superior outcomes compared to selective estrogen receptor modulators (SERMs) alone, with AI also outperforming tamoxifen in iDFS (HR=0.70, 95% CI 0.54-0.90). The combination of endocrine therapy and chemotherapy showed no significant improvement over endocrine therapy alone in hormone receptor-positive (HR+) BC patients. In HER2-positive patients, trastuzumab combined with chemotherapy significantly improved OS (HR=0.12, 95% CI 0.08-0.19), DFS (HR=0.13, 95% CI 0.08-0.21), and iDFS (p<0.0001) compared to chemotherapy alone. Conclusion: This review highlights the importance of personalized treatment approaches for invasive non-metastatic BC in real-world settings. Observational studies provide additional insights to randomized controlled trials, revealing the variability in survival and the increasing complexity of treatment strategies. This emphasizes the need for ongoing research to refine guidelines and improve patient care.

Créscence Joëlle Mefou Tasong, Université Laval

Lifetime consumption of coffee, tea and caffeine, and prostate cancer risk

Background Coffee, tea and caffeine consumption may have a protective effect against prostate cancer, possibly through their antioxidant and/or anti-inflammatory properties. Previous studies have mostly focused on recent intakes, and many had limited or no information about cancer aggressiveness. Objective To evaluate associations between lifetime consumption of coffee and tea, and of recent caffeine intake from all sources, and the risk of prostate cancer, overall and by aggressiveness. Methods We used data from PROtEuS, a population-based case-control study conducted in 2005-2012 in Montreal, including 1917 incident prostate cancer cases and 1991 population controls. Interviews elicited information on lifetime intake of coffee, black and green tea, accounting for changes over time, as well as other relevant factors. Recent caffeine intake (2 years ago) was calculated including other food/beverage sources as well. Unconditional logistic regression assessed associations with overall cancer risk; polytomous models were used to account for cancer aggressiveness. Models were adjusted for age, ancestry, education, fruits and vegetables intake, and body mass index. Results The adjusted odds ratio (OR) for overall prostate cancer associated with each increase of 50 cup-years of coffee over the lifetime (corresponding to an increase of about one cup/day, on average, for someone aged 65 was 0.96 (95% confidence interval [CI]: 0.92-0.99). The corresponding value for aggressive cancer (Gleason score ≥8) was 0.90 (95%CI: 0.83-0.98). There was no clear evidence of an association with black or green tea, which were rarely consumed in this population, or with recent caffeine intake. Findings were unaltered when considering prostate cancer screening. Conclusion Findings suggest a protective effect of lifelong coffee consumption on prostate cancer risk, particularly for its aggressive form. Future analyses will focus on lifetime caffeine intake and consumption trajectories.

Miceline Mesidor, Institut national de la recherche scientifique, Assistant Professor

Risk of developing subsequent primary breast and colorectal cancers among adult cancer survivors: implications for targeted prevention and screening

Background: An estimated 1.5 million Canadians are living with and beyond cancer and may carry elevated risks of developing subsequent primary cancers at different sites, including cancers of the breast (BC) and colorectum (CRC). Objectives: To characterize the risk of developing subsequent primary BC and CRC among survivors of different-site first primary cancers (FPC). Methods: We included all adults diagnosed with a first cancer between 2000 and 2021 recorded in the Alberta Cancer Registry and who survived at least six months. Survivors were followed from 6 months post FPC diagnosis until diagnosis of a CRC/BC, death, or administrative censoring. We estimated incidence rates and standardized incidence ratios (SIR) for CRC/BC development compared to those without a history of cancer. Results: Among 172,928 non-CRC cancer survivors and 59,687 non-BC female cancer survivors, 1,812 and 1,113 developed subsequent CRC and BC. Compared to those without a history of cancer, cancer survivors had an elevated risk of developing CRC (SIR = 1.49, 95% CI: 1.42-1.56) and BC (SIR = 1.44, 95% CI: 1.36-1.53). Survivors of 12 and 8 different FPC sites were at elevated risk of developing subsequent CRC and BC. Of these FPC sites, 75.0% and 62.5% share an etiologic risk factor with CRC or BC. Cancer survivors were at an elevated risk of subsequent CRC and BC across age groups during follow-up (<50, 50-74, 75+) with the majority of cases occurring during screening eligible ages. Cancer survivors were also at an elevated risk of developing late stage (III/IV) CRC and BC. Finally, the risk of developing subsequent CRC and BC both overall and at a late stage, increases with the length of time since FPC diagnosis. Conclusions: Adherence to general population BC/CRC prevention and screening guidelines are important for cancer survivors, and targeted approaches for specific survivorship groups could be warranted.

Dylan O'Sullivan, University of Calgary

Reevaluating Parity and Breast Cancer Mortality: An Age-Specific Perspective

Background While parity is known to influence breast cancer risk, its impact on mortality across age groups remains unclear. Understanding these age-specific effects is essential for improving risk assessment and prevention strategies. Objectives This study examines how the relationship between the number of children and breast cancer mortality changes with age. Methods A retrospective cohort of 894,608 Israeli women born between 1940 and 1960 was followed from 1990 to 2020. Women contributed data within three age groups: 30–49, 50–64, and 65–80. Cox proportional hazards models evaluated the association between parity (0, 1–2, 3+ children) and breast cancer mortality, adjusting for socio-demographic factors and calendar year of entry into each age category. Results Among women aged 30–49, those with 1–2 (HR=1.656, 99% CI: 1.349–2.033) or 3+ children (HR=1.551, 99% CI: 1.271–1.893) had higher mortality risk than childless women. In ages 50–64, these differences were no longer significant after adjustment (HR=1.071, 99% CI: 0.949–1.209; HR=0.935, 99% CI: 0.830–1.054). At ages 65–80, risk remained elevated for women with 1–2 children (HR=1.237, 99% CI: 1.045–1.466) but not for those with 3+ children (HR=0.989, 99% CI: 0.834–1.173). Conclusions Parity's effect on breast cancer mortality varies by age. Younger mothers face higher mortality risk, while the association weakens in middle age and shifts in older age. These findings highlight the need for age-specific risk assessment and prevention strategies.

Dan Bouhnik

The Levonorgestrel Intrauterine Device and Ovarian Cancer Risk: A Population-Based Study

Background Risk-reducing salpingectomy (RRS) can prevent ovarian cancer in women at higher-than-average lifetime risk without the detrimental hormonal consequences associated with bilateral removal of the ovaries. To determine who is at higher-than-average lifetime risk, we must understand how common exposures, such as the Levonorgestrel Intrauterine Device (LNG-IUD) affect risk of ovarian cancer. Objective This project examined the risk of ovarian cancer in LNG-IUD users compared to non-users in British Columbia (BC), Canada between 2001 and 2021. Methods This research used population-based datasets from BC to complete a survival analysis comparing the number of ovarian cancer cases in individuals who used the LNG-IUD between 2001 and 2021, and those who had never used it, while controlling for important confounders, such as previous oral contraceptive (OCP) use and age. Results Women who were ever users of the LNG-IUD had a lower risk of ovarian cancer than never users, when controlling for prior OCP use and age. A similar protective effect was found when LNG-IUD users were age-matched to non-users in a 1:1 ratio. In a subset of the cohort, which included only those who reached the age of 60 by the end of the study period, there was no significant difference in risk between the exposed and unexposed groups. Histotypes did not differ significantly between the exposed and unexposed group. Conclusion While the LNG-IUD may be protective against ovarian cancer, which is in line with previous study results, these results should be interpreted with caution, as many LNG-IUD users are young and have not reached an age at which they are at a significant risk of ovarian cancer.

Abigail Shore, University Of British Columbia

Mapping the Overall Safety Profile of Levothyroxine-Related Adverse Events: a Disproportionality Analysis on Individual Case Safety Reports Collected by the FAERS

Background: Levothyroxine is widely prescribed for hypothyroidism and thyroid cancer, but concerns about adverse effects, particularly at high doses, persist. Real-world safety data remain limited, warranting further evaluation using FAERS. Objectives: To assess levothyroxine's safety profile using FAERS individual case safety reports (ICSRs) via active disproportionality analysis (ADA). The primary objective was to identify and characterize adverse events (AEs). Secondary objectives included detecting dose-specific signals and analyzing age- and gender-related patterns. Methods: Disproportionality analysis was performed using Reporting Odds Ratio (ROR), Proportional Reporting Ratio (PRR), Bayesian Confidence Propagation Neural Network (BCPNN), and Multi-Item Gamma Poisson Shrinker (MGPS). Signals required confirmation by all four criteria (i.e., IC025 > 0, the lower bound of RR and PRR > 1, and EGBM05 > 2) . Dose-dependent signals were identified using ROR, PRR, and IC025.. Levothyroxine-associated AEs were identified using MedDRA-v27.1 preferred term. Results: Analysis of 45,877 FAERS reports revealed 201,473 AEs linked to levothyroxine. A total of 291 safety signals were identified, including 22 labeled (e.g., alopecia [ROR: 10.25], palpitations [ROR: 13.29], irritability [ROR: 13.49]) and 269 unexpected AEs (e.g., social avoidant behavior [ROR: 48.49], polyglandular autoimmune syndrome type II [ROR: 118.76]). High-dose levothyroxine (>100 µg) was associated with higher risks of vertigo (ROR: 20.13), celiac disease, and fatigue, supporting a dose-response relationship. AEs were more common in females (67%), with a median age of 52 years (IQR: 41–65). Fatigue, headache, and weight increase were the most frequently reported AEs, with a median onset of 56–143 days. Conclusions: This study provides a comprehensive safety profile of levothyroxine, identifying both known and unexpected AEs, including those with significant dose-dependent risks. These findings highlight the need for further research to validate signals and elucidate underlying mechanisms.

Mohammad Ali Omrani, Western University

Trimethoprim-Sulfamethoxazole (TMP-SMX) and Risk of Hemophagocytic Lymphohistiocytosis (HLH): A Literature Review and Disproportionality Analysis Using Individual Safety Case Reports from FAERS

Background: Trimethoprim-sulfamethoxazole (TMP-SMX) has been linked to hematologic adverse events, but its association with hemophagocytic lymphohistiocytosis (HLH) remains unclear. Objectives: To review the literature on TMP-SMX and HLH and assess its risk using the FDA Adverse Event Reporting System (FAERS). Methods: A Medline/Embase search (up to March 1, 2025) identified studies on TMP-SMX and HLH. The Naranjo scale assessed causality in case reports. FAERS data (2004Q1–2023Q4) were analyzed, comparing HLH reports for TMP-SMX versus amoxicillin/clavulanic acid and azithromycin. Disproportionality analyses used Reporting Odds Ratios (ROR), Proportional Reporting Ratios (PRR), and Information Components (IC025), with logistic regression adjusting for confounders. The study follows READUSPV guidelines. Results: Five case reports (median age: 34 years, 80% male) described TMP-SMX-associated HLH, with symptom onset 2–12 days post-initiation. The Naranjo scale suggested a possible to probable association. In FAERS, HLH was reported in 0.09% of TMP-SMX cases, compared to 0.03% for amoxicillin/clavulanic acid and 0.01% for azithromycin. TMP-SMX-associated HLH was more common in males (75.7%) and in patients ≤18 years (69.2%). Disproportionality analysis showed that HLH reports were significantly higher for TMP-SMX compared to amoxicillin/clavulanic acid (ROR: 3.08; 95% CI 1.67–5.68) and compared to azithromycin (ROR: 13.89; 95% CI 5.88–32.82). These findings remained consistent across frequentist and Bayesian methods and adjusted analyses. Conclusion: TMP-SMX may be linked to an increased risk of HLH. Clinicians should remain vigilant for this rare but serious adverse event. Further pharmacoepidemiologic studies are needed to confirm these findings to ensure safe use.

Mohammad Ali Omrani, Western University

Healthcare-seeking behaviour as a potential confounder in the study of analgesic use and ovarian cancer risk

Background: Pharmacoepidemiologic studies using administrative databases are susceptible to confounding from unmeasured healthcare seeking as individuals with such behaviours may experience better health outcomes, independent of medication use. Objectives: We examined whether healthcare-seeking behaviour is associated with prescription analgesic use and whether it confounds the relationship between analgesic use and ovarian cancer risk. Methods: In a population-based case-control study (498 cases, 908 controls) in Montreal (2011-2016), data on compliance with breast, cervical, and colorectal cancer screening recommendations and frequency of routine physical exams were used to calculate a score for healthcare-seeking behaviour (categorized as low, medium, and high). Prescription analgesic use (aspirin, acetaminophen, nonsteroidal anti-inflammatory drugs) was classified as regular (≥1 tablet/month for ≥6 months) vs. never/occasional. Unconditional logistic regression was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for the association between healthcare-seeking behaviour and prescription analgesic use, for the whole study population and for controls only, who represent the base population. In addition, ORs for the association between prescription analgesic use and ovarian cancer risk were estimated, with and without adjustment for healthcare-seeking behaviour. All models were adjusted for age and education level. Results: For the association between healthcare-seeking behaviour and analgesics use, ORs (95% CIs) for high and medium, vs. low, were 1.37 (0.98-1.91) and 1.18 (0.82-1.69), respectively. Among population controls only, the ORs (95% CIs) were 1.87 (1.21-2.89) for high and 1.57 (0.99-2.49) for medium. For the association between total analgesic use and ovarian cancer, ORs (95% CIs) were 0.88 (0.68-1.13) and 0.89 (0.68-1.16) before and after adjustment for healthcare-seeking behaviour, respectively. Conclusion: While healthcare-seeking behaviour was positively associated with prescription analgesic use, particularly among population controls, it did not confound the association with ovarian cancer risk. This may be because healthcare-seeking behaviour is not strongly associated with an ovarian cancer diagnosis.

Jessica Boivin, McGill University

Implementing Physiotherapist-Pharmacist Collaborative Care for Knee OA: Methodological Insights from a Community-Based Pragmatic RCT

Background: Early knee osteoarthritis (OA) is often underdiagnosed, with many individuals relying on over-the-counter medications. As highly accessible healthcare providers in the community, pharmacists can screen for OA and facilitate multidisciplinary care. This study proposes a pharmacist-physiotherapist collaborative model to manage early stage knee OA. We discuss the methodological challenges in assembling this pragmatic randomized control trial (RCT) in the community for OA care. Objectives: The objective of the primary study is to evaluate the effectiveness of a 3-month pharmacist-physiotherapist collaboration in reducing pain and functional limitations in early knee OA patients. Methods: A prospective, pragmatic RCT is conducted across urban and rural Alberta in pharmacies partnered with local physiotherapy clinics. A total of 125 patients will be randomized to either the intervention or usual care group. The intervention includes a comprehensive pharmacist assessment, medication review, and referral to physiotherapy for an evidence-based group exercise program for knee OA. The usual care group receives a brief pharmacist assessment, non-prescription recommendations, and an education pamphlet. Usual care participants may opt into the intervention at 3 months. Follow-up occurs at 3 and 6 months post-intervention. Results: Outcomes will be assessed using OA disease-specific measures, self-management measures, physiotherapy adherence, and patient-reported satisfaction. We encountered a few methodological challenges. Careful consideration was required to decide whether to randomize at the participant or site level. Additionally, maintaining the participation of usual care participants necessitated a delayed intervention option. Lastly, a lack of tools for communication and collaboration for non-physicians led to the development of a platform for data collection and documentation, as well as a survey to measure clinician collaboration. Conclusion: Addressing these challenges provides insights into implementing pragmatic RCTs in community settings. Findings may inform future healthcare models that enhance accessibility, self-management, and quality of life for individuals with chronic conditions like OA.

Jordyn Burgar

Contemporary Trends in Oral Anticoagulant Use Among Patients with Atrial Fibrillation and Cancer in UK Primary Care

Background Anticoagulation is essential for patients with atrial fibrillation (AF) and cancer owing to their elevated stroke risk. However, real-world evidence on oral anticoagulant (OAC) use remains limited since the approval of the most recent direct oral anticoagulant (DOAC). Objectives To describe trends in OAC prescriptions and factors associated with initiation in patients with AF and cancer in UK primary care from 2010 to 2023. Methods Using the Clinical Practice Research Datalink, we identified patients aged ≥ 50 years with AF and a prior or concurrent cancer diagnosis. Annual incidence proportion of patients initiating OACs within one year of AF diagnosis was calculated, overall and by OAC type, sex, and age. Multivariable logistic regression was used to identify factors associated with initiation, including age, sex, cancer characteristics and major comorbidities. Results Among 112,594 patients with AF and cancer, 84,250 (74.8%) initiated an OAC. The proportion prescribed an OAC rose from 40.9% in 2010 to 79.6% in 2023, driven by DOACs (0.03% → 78.9%), while vitamin K antagonist (VKA) use declined (40.9% → 0.7%). In 2023, apixaban (38.1%) and edoxaban (35.4%) were most prescribed. OAC initiation increased with age and did not differ by sex. Initiation was less common in patients with hematologic, lung, or metastatic cancers, and in those with dementia, or chronic kidney disease. Conclusions In the last decade, OAC use has nearly doubled among patients with AF and cancer, with DOACs replacing VKAs. However, about one in four patients remain untreated, especially those with hematologic or lung cancers, metastatic cancer, or additional comorbidities .

Joseph Junior Damba, Mcgill University

Evaluating the Effectiveness of an Electronic Data Collection Platform to Improve Patient Response Rates in a Canadian Orthopaedic Arthroscopic Surgery Registry

BACKGROUND The routine collection of patient-reported outcome measures (PROMs) is vital to patient-centric policy and research. Lack of response to questionnaires results in inefficient programming and there is little guidance on how to improve engagement in PROMs registries. OBJECTIVES Three data collection procedures were trialed to improve the effectiveness of an institutional knee and shoulder registry: emailed PROMs (EPROMs), EPROMs with a reminder phone call, and traditional paper-based PROMs. METHODS An electronic medical records integrated software was selected. Surgeries from June 1, 2023 to January 31, 2024 were included. Preoperatively patients selected preference for email or paper questionnaires. All patients received questionnaires 1-year postoperatively and half who selected email were randomly assigned to receive a reminder phone call if the questionnaire was not complete. Logistic regression assessed the effect of age, sex, contact method, and reminder phone call on response status; odds ratios (ORs) and 95% confidence intervals (CIs) were estimates. Research coordinators diarized data collection time. RESULTS There were 509 procedures included (knee N=245; shoulder N=264) and 79% of patients preferred email. The EPROMs response was 30% (65/217) without a reminder and 45% (84/187) in the reminder group. Sixty-one percent (64/105) of paper questionnaires were returned. After adjusting for age and sex, patients who received EPROMs without a reminder had lower odds of response compared to paper questionnaires (OR=0.30; p<0.001; [95%CI 0.18 to 0.50]). Out of patients who received EPROMs, those with a reminder had higher odds of response (OR=1.93; p=0.002; [95%CI 1.27 to 2.92]). The mean data collection time per questionnaire was highest in the paper group (paper=16mins; email=6mins; email with call=10mins). CONCLUSION The majority of patients requested EForms however, paper-based forms had higher odds of response compared to electronic methods. Reminder calls were effective in improving response in the EForm group and EForms reduced resources compared to paper.

Sarah Harris, University of Manitoba and Pan Am Clinic Foundation

Sacubitril-valsartan and Risk of Ototoxicity: A Disproportionality Analysis

Background: Sacubitril/Valsartan (Sacu-Val), the first angiotensin receptor neprilysin inhibitor, was approved by the FDA in 2015 for heart failure with reduced ejection fraction. Following its approval, concerns about potential ototoxicity emerged, but data remain limited. Objectives: This study assessed the association between Sacu-Val and hearing impairment and vestibular disorders compared to Lisinopril and Losartan using FDA Adverse Event Reporting System (FAERS) data. Methods: An active comparator-restricted disproportionality analysis of FAERS data (2015Q3–2023Q3) was conducted, using MedDRA-v27.1 preferred terms and limiting the analysis to primary suspect cases. Reporting Odds Ratios (RORs) were adjusted for sex, age, and indication. Bayesian Information Component (IC) and Empirical Bayes Geometric Mean (EBGM) were also calculated. Results: Among 55,101 individual case safety reports, Sacu-Val accounted for 51.0% (28,091), Lisinopril for 33.5% (18,430), and Losartan for 15.6% (8,580). Hearing impairment was more frequent with Sacu-Val (1.47%) than Lisinopril (0.53%) or Losartan (0.93%). Adjusted RORs for hearing impairment were 2.35 (95% CI, 1.80–3.06) vs. Lisinopril and 1.97 (95% CI, 1.46–2.66) vs. Losartan. Hypoacusis, representing 71.91% of hearing impairment reports, showed significantly higher RORs with Sacu-Val: 15.03 (95% CI, 7.48–30.23) vs. Lisinopril and 7.44 (95% CI, 3.91–14.15) vs. Losartan. In Bayesian analyses, Sacu-Val showed a higher-than-expected frequency of hypoacusis compared to both Lisinopril (EBGM 20.5, 90% CI 18.5–22.5) and Losartan (EBGM 7.97, 90% CI 7.22–8.76). Vestibular disorders were also more frequent with Sacu-Val (1.47%), with adjusted RORs of 2.58 (95% CI, 2.33–2.86) vs. Lisinopril and 1.78 (95% CI, 1.58–2.00) vs. Losartan. Conclusions: Sacu-Val is associated with a higher incidence of reports of hearing impairment, including hypoacusis, and vestibular disorders, compared to Lisinopril and Losartan. Further pharmacoepidemiologic studies are needed to confirm these findings.

Atefeh Jafari, Western University, Student

Safety of Transient Oral Corticosteroids Use in Mild-to-Moderate Asthma for Exacerbation Management: Methodological Review and Beyond

Background Short-term oral corticosteroids (OCS) are the standard treatment for exacerbations in patients with asthma. With over 1.8 million asthma patients in Canada, the safety of OCS remains a public health concern, yet observational studies reported inconsistent findings for the risks of OCS in asthma. We reviewed observational studies of acute OCS risks in patients with asthma, focusing on biases, to explain the variations in findings. We describe these biases and propose methodological improvements for robust causal inference. Method We conducted a PubMed search to identify all population-based observational studies that examined the safety of short-term OCS use in asthma, published in the last 10 years. Each paper was evaluated for study methods, results, and potential biases. Results We identified four studies, all adopting a cohort approach. All studies reported increased risks of adverse events with OCS, such as cardiovascular (CV) events, sepsis, and pneumonia. For example, hazard ratios for CV outcomes associated with OCS compared with non-use ranged from 1.4 to 5.1. We found that all studies were affected by confounding bias. Three studies used cohort definitions that failed to distinguish short- and long-term OCS users, leading to effect-modification and exposure misclassification, undermining acute risk estimations. One study was also affected by immortal time and selection bias. Conclusion Studies of OCS safety in asthma patient have significant methodological limitations that can explain their divergent results, hindering their ability to inform safe clinical decision-making. More rigorous designs that avoid these issues should be considered. For example, the case-crossover approach can control for measured and unmeasured time-invariant confounders and minimize selection bias, as it does not require the identification of comparator individuals. Additionally, target trial emulation using, for example, a prevalent new-user design, can help mitigate time-related biases, enhance confounding control, and improve risk estimation when comparing OCS users with non-users.

Jiaying (Shirly) Li, McGill University

The Impact of Glucagon-like Peptide-1 Receptor Agonists (GLP-1 RA) on Weight Loss in Overweight and Obese Populations: A Systematic Review of Randomized Controlled Trials

BACKGROUND Poor weight management is a widespread concern in Western populations due to changes in dietary and physical activity habits. Overweight or obese individuals are at an increased risk of developing multiple chronic illnesses. Weight loss is challenging despite dietary and physical activity interventions due to metabolic and hormonal adaptations. Novel pharmacologic interventions, such as glucagon-like peptide-1 receptor agonists (GLP-1 RA), may be a useful tool for weight reduction to prevent chronic disease. OBJECTIVES We conducted a systematic review to examine the impact of GLP-1 RA in reducing bodyweight in phase III trials including overweight, obese, and diabetic populations. METHODS We searched the MEDLINE (Ovid) database for Phase III randomized controlled trials of GLP-1 RA among adults who were overweight, obese, diabetic or pre-diabetic at the time of trial eligibility. Studies were included if they reported weight loss outcomes in terms of total or relative weight changes within study arms. RESULTS The literature search returned 359 trials published between 2004 and 2025. 131 trial studies were assessed for eligibility, of which 36 were included. Agents evaluated in the trials included semaglutide (1.0, 1.7, and 2.4 mg), liraglutide (3.0 mg), tirzepatide (5, 10, and 15 mg), and exenatide (10 µg). Trial duration ranged from 24 to 208 weeks. Among trial arms lasting more than 52 weeks, the range of effects was -20.90% to -3.00%. The strongest effect observed in trials over 52 weeks was a 20.90% reduction in body weight from 15mg doses of tirzepatide (weekly) of over 72 weeks. CONCLUSION Pharmacologic intervention is a useful option for the rapid reduction of bodyweight and adiposity in populations at elevated risk for chronic diseases. Future research should address initial weight gain prevention and maintaining long-term weight loss once off treatment with GLP-1 RA.

Reynaldo Nambayan, University of Calgary, Research Assistant

Medication Trajectories among Persons with Multiple Sclerosis in a Quebec Birth Cohort

Background: Persons living with multiple sclerosis (MS) are exposed to several medications to manage the disease and comorbidities. There is little evidence regarding the long-term use of medications and evolution over time in this population in Quebec. Objectives: We aimed to identify distinct medication trajectories among people living with MS and to ascertain sociodemographic and health care utilization factors associated with these trajectories. Methods: Data from the Quebec Birth Cohort on Immunity and Health (CO·MMUNITY) were used. Individuals were followed from their MS diagnosis (between 1997 and 2011) until 2014. Included individuals were covered by the public drug insurance during at least three years following their diagnosis. Latent class growth analysis was used to identify medication trajectory groups. Model selection was based on minimizing the Bayesian Information Criterion and model adequacy was assessed using the average posterior probabilities and entropy. A multinomial logistic regression model was used to identify factors associated with medication trajectories. Results: The study included 551 individuals; three-quarters were female and the median age at MS diagnosis was 31 years. The median number of medications in the first year after diagnosis was 4. Four distinct groups of medication trajectory were identified: low (n=143, mean medications in the year following diagnosis =1.5), moderate (n=248, mean medications=3.8), high (n=129, mean =7.3), and very high (n=31, mean =15) medication. Female sex and older age were associated with a higher likelihood of being in the moderate, high and very high medication groups compared to the low one. Individuals in the high medication group were also most likely to use emergency department services. Conclusion: This is the first study to examine longitudinal patterns of medication use in MS individuals in Canada. The findings can improve our understanding of medication use dynamics over time and inform strategies for optimizing prescriptions for this population.

Yasmine Sadou

Sodium Glucose Co-Transporter 2 Inhibitors versus Dipeptidyl Peptidase-4 Inhibitors and the Risk of Ventricular Arrhythmia Among Patients with Type 2 Diabetes: A Population-Based Cohort Study

Background: While prior observational studies suggest potential antiarrhythmic effects of sodium glucose co-transporter 2 inhibitors (SGLT2i), their impact on ventricular arrhythmias (VA) remains uncertain. Objective: To determine whether SGLT2i use, compared with dipeptidyl peptidase-4 inhibitors (DPP4i) use, is associated with the risk of VA among patients with type 2 diabetes. Methods: We conducted a population-based cohort study using a prevalent new-user design and data from the Clinical Practice Research Datalink Aurum, linked to hospitalization and vital statistics databases. SGLT2i users were matched to DPP4i users on diabetes treatment intensity, duration of prior DPP4i use, calendar time, sex, age, and time-conditional propensity score. Cox models estimated the hazard ratio (HR) and corresponding 95% confidence intervals (CI) for VA with SGLT2i vs DPP4i use. Secondary analyses stratified by SGLT2i user type. Secondary outcomes included fatal VA and cardiac arrest. Results: Among 88,516 matched patients, 385 VA events occurred over a median follow-up of 0.8 years (25.3 per 10,000 person-years). Overall, SGLT2i use was not associated with VA risk (HR: 0.88, 95% CI: 0.71-1.07). There was no association among incident new users (HR: 0.98, 95% CI: 0.76-1.27) but an association with a lower risk among prevalent new users (HR: 0.65, 95% CI: 0.46-0.92). SGLT2i use was not associated with the risk of fatal VA (HR: 1.76, 95% CI: 0.47-6.64) but with a lower risk of cardiac arrest (HR: 0.64, 95% CI: 0.49-0.83). Conclusions: SGLT2i use was not associated with the risk of VA among patients with type 2 diabetes.

Wang-Choi (William) Tang

Legacy, alternative, and precursor PFAS and associations with lipids and liver function biomarkers: results from a cross-sectional analysis of adult females in the MIREC-ENDO study

Background Per- and polyfluoroalkyl substances (PFAS or “forever chemicals”), are used in consumer products for their water and oil repellent properties. Several legacy PFAS have been regulated in Canada since 2010. Since then, concern over several alternative and precursor PFAS has emerged, which may be similarly harmful to human health, but epidemiological evidence is lacking. Objective To investigate associations between serum concentrations of 31 legacy, alternative, and precursor PFAS, both individually and as mixtures, and serum lipids and liver function biomarkers. Methods PFAS, cholesterols, triglycerides, and liver function biomarkers were analyzed in serum samples provided by 282 adult females participating in a 2018–2021 follow-up study of the Maternal-Infant Research on Environmental Chemicals (MIREC) Canadian pregnancy cohort. We examined associations with individual PFAS using multiple linear regression adjusted for covariates. We used three statistical approaches to examine mixtures of PFAS: 1) sum of 7 legacy and 17 detected PFAS, 2) weighted quantile sum (WQS) regression, and 3) quantile g-computation. Results Each two-fold increase in concentrations of PFHxS, PFOS, PFNA, PFDA, PFHpS, and the sum of 7 legacy PFAS, were associated with up to 7% higher total and LDL cholesterol and the TC:HDL ratio. Individuals with detectable concentrations of 4 alternative/precursor PFAS (EtFOSA, MeFOSA, PFBS, and 9Cl-PF3ONS) had up to 17% higher total and LDL cholesterol and the TC:HDL ratio. Each one-quartile increase in the mixture of 7 PFAS was associated with up to 10% higher total and LDL cholesterol. Adding additional PFAS to the mixture (17 PFAS) made estimates less precise or attenuated associations to the null. Results for liver function biomarkers were mixed and inconsistent. Conclusion Exposure to legacy PFAS and their replacements (alternative and precursor PFAS), as well as mixtures of PFAS, are associated with higher cholesterol levels; prospective studies are required to confirm these findings.

Michael Borghese

Long-term exposure to ultrafine particles and cardiovascular mortality: Do associations vary by exposure assessment method?

Background: Long-term exposure to fine particulate matter has been causally associated with cardiovascular mortality. The extent to which ultrafine particles (UFPs) contribute to this association remain uncertain. Studies examining UFPs have relied on exposure models with moderate performance and limited temporal coverage. Objective: We investigated whether annual mean UFPs exposure predicted from different methods was associated with all-cause and ischemic heart disease (IHD) mortality. Methods: We carried out a retrospective population-based cohort study of 716,157 adults residing in Quebec City, Canada, between 2000 and 2017. We leveraged high-resolution UFPs surfaces from six different statistical and machine learning methods. These models were based on measurements from a one-year mobile monitoring campaign and exhibit high performance (cross-validated R2 from 0.64-0.86). We assigned annual mean UFPs exposure to participants' time-varying residential postal code. We estimated hazard ratios (HRs) using Cox proportional hazards models, adjusted for potential confounders. We considered potential non-linearity and adjustments for co-exposure to air pollutants. Results: The cohort included 7.2 million person-years of follow-up, with 15,603 IHD deaths. Associations between annual UFPs exposure and IHD mortality were positive but nonlinear. The shape of relationship was not entirely consistent across the different exposure methods. Using UFP estimates from XGBoost (extreme gradient boosting), which was our best performing model, the HR adjusted for co-pollutants was 1.20 (95% CI: 1.09, 1.31) for a change from the 10th to 50th percentiles, and 1.04 (95% CI: 0.99, 1.09) from the 50th to 90th percentiles in annual UFPs exposure. Corresponding HRs using forward stepwise linear regression, our least accurate model, were 1.03 (95% CI: 0.95, 1.12) and 1.11 (95% CI: 1.07, 1.16). Conclusions: Long-term residential exposure to ambient UFPs was associated with IHD mortality. The shape and magnitude of the association varied depending on the exposure assessment method.

Stephane Buteau, Université De Montréal

Exposure to air pollution during pregnancy and the risk of childhood cancer

Background: Exposure to air pollution during the prenatal period may be an important exposure window for childhood cancers, but the epidemiological evidence remains scarce. Objective: We investigated whether prenatal exposure to ambient fine particulate matter (PM2.5) and nitrogen dioxide (NO2; a marker of traffic-related pollution), was associated with childhood cancer incidence. Methods: We conducted a longitudinal cohort study of 1,121,996 newborns in Quebec, Canada. Maternal exposure during pregnancy was estimated using weekly and biweekly concentrations of PM2.5 and NO2 from satellite-based and land-use regression models. Associations with any cancer, central nervous system tumors (CNS), and leukemia among children up to 14 years of age were estimated using Cox proportional hazard models adjusted for potential confounders. We examined single- and two-pollutant models, and assessed the modifying effects of maternal and infant characteristics. Results: The cohort included 2,187 incident childhood cancers. Adjusted hazard ratios (HR) for any cancer were 1.08 (95% CI: 0.99, 1.17) and 1.06 (95% CI: 0.98, 1.15) per interquartile increase in PM2.5 (3.5 µg/m3) and NO2 (4.6 ppb), respectively. For CNS tumors, associations were observed but only in children aged ≥7 years; the HR was 1.35 (95% CI: 0.98, 1.88) for PM2.5 and 1.36 (95% CI 0.99, 1.88) for NO2. For acute lymphoblastic leukemia, the HR was 1.06 (95% CI: 0.90, 1.25) for PM2.5 and 1.15 (95% CI: 0.77, 1.70) for NO2. Though CIs were wide, a positive association was suggested between acute myeloid leukemia and PM2.5 (HR= 1.15; 95% CI: 0.77, 1.70), but not for NO2. In mothers with comorbidity, exposure to PM2.5 and NO2 during pregnancy appeared to be associated with a greater risk of childhood cancers. Associations from single and two-pollutant models were similar. Conclusion: Maternal exposure to air pollution during pregnancy is associated with an increase in the risk of childhood cancer.

Stephane Buteau, Université De Montréal

Impact of density and proximity to oil and gas wells on birthweight in Northeast British Columbia

Background: Hydraulic fracturing has spurred significant growth in Northeast British Columbia's oil and gas sector, raising concerns about health consequences. Conventional and unconventional wells may release contaminants with potential deleterious health effects on fetal development. Objective: There is limited information on the relationship between exposure to conventional and unconventional wells and birthweight in Northeast British Columbia. Therefore, we aim to investigate these associations. Methods: Individuals who gave birth to term newborns at the Fort St John hospital between April 04, 2004, and December 30, 2023 were included (n=10,712). We sourced the regional oil and gas wells data from the British Columbia Energy Regulator. Oil and gas exposure was estimated during the whole pregnancy by determining the density of oil and gas wells (all wells, conventional, unconventional) within 5 and 10km radii of residential postal codes at delivery. We conducted multiple linear regression analyses to assess the associations between density of oil and gas wells by type and birthweight, adjusting for covariates such as maternal age, smoking, and neonatal sex. Results: We observed a negative association between the density of 1) conventional wells within 10km of the participants' postal code and birthweight (standardized β: -0.025, 95% CI: -0.043; -0.006), and 2) all wells within 10km (standardized β: -0.016, 95% CI: -0.026; 0.000). No significant association was observed between the density of wells (regardless of type) within 5km of the participants' postal codes and birthweight. Conclusion: Our results indicate that higher density of conventional wells and all types of wells within 10km may be associated with lower birthweight. This research adds to the growing body of literature on the potential health impacts of oil and gas operations.

Coreen Daley, University of Toronto

Associations between temperature, green spaces, and adverse pregnancy outcomes in Bangladesh

Objective: Climate change is significant public health challenges in Bangladesh. Climate change and extreme temperatures have been linked to adverse birth outcomes such as low birth weight and pre-term birth, while exposure to green spaces has been suggested as a potential adaptation strategy to mitigate the harmful effects of climate change. The objective of this study is to investigate associations between temperature exposures and the risk of preterm birth (PTB) and low birth weight (LBW), in Bangladesh. Additionally, this study will explore whether exposure to green spaces modifies these associations. Material and Methods: The study will be completed using birth data obtained from the 2022 Bangladesh Demographic and Health Survey (DHS). Exposure variables that will be analysed include temperature (average monthly mean, maximum, minimum, and diurnal temperatures) and green space (Normalized Difference Vegetation Index (NDVI)) variables. The planned analyses include multilevel logistic regression to estimate associations between temperature, and birth outcomes, adjusting for relevant maternal and sociodemographic confounders. Effect modification will be used to explore whether NDVI modifies these associations. Results: It is hypothesized that higher temperatures are associated with increased odds of PTB and LBW, while NDVI will weaken this association, suggesting a potential adaptive effect. Conclusion: Bangladesh is among the most polluted countries worldwide, however, research concerning climate change adaptation in Bangladesh is limited. This study will analyse the relationship between temperature variables, green spaces, and adverse birth outcomes. Evidence in this area is necessary to protect the health of highly vulnerable populations, pregnant women and newborns, from the impacts of climate change and inform future adaptation policy, urban planning, and research.

Sachit Gurung, University of Alberta, Graduate student at University of Alberta

The association between exposure to unconventional oil and gas development and congenital disorders in Northeast British Columbia

Background: Unconventional oil and gas development (UOGD, or “fracking”), has grown rapidly in Northeast British Columbia (NEBC). UOGD releases pollutants that include endocrine disrupting chemicals (interfering with hormone function) and teratogens (causing abnormalities in the fetus). Objectives: Emerging research suggests exposure to UOGD may be associated with adverse birth outcomes such as congenital disorders and small for gestational age (SGA). This study aims to examine these associations in NEBC. Methods: We conducted a retrospective cohort study among live singleton births at Fort St. John Hospital in NEBC from 2004-2023 using the BC Perinatal Data Registry. Congenital disorders were identified using International Classification of Diseases, Tenth Revision diagnosis codes starting with Q. SGA was defined as sex- and gestational age-specific birth weight ≤10th percentile of the study sample. We estimated UOGD exposure using inverse distance-squared weighting of all oil and gas wells and UOGD wells only, stratified by 5km and 10km radii of residential postal codes. We fit marginal models using generalized estimating equations with robust standard errors to estimate Odds Ratios (ORs) for congenital disorders and SGA in relation to quartiles (Q1-Q4) of UOGD exposure. Models were adjusted for relevant covariates determined by directed acyclic graphs. Results: There were 10,910 newborns included. Compared to Q1 of UOGD exposure, adjusted models showed significantly higher odds of SGA at 10km radii for UOGD wells at Q2 (OR=1.27; 95%Confidence Interval[CI] 1.06,1.52; p<0.01) and Q4 (OR=1.21; 95%CI 1.00,1.46; p<0.05). These patterns were not observed for all oil and gas wells, which suggests that UOGD may affect SGA differently. Higher exposure to UOGD was not significantly associated with congenital disorders after adjusting for other factors. Conclusion: UOGD is being massively upscaled in NEBC, and these findings highlight the need to better understand its impacts on perinatal health to support risk assessment and public health.

Jannie Leung

Policy-driven Reductions in Traffic-related Air Pollutant Mixtures and Mortality Risk in Toronto: A Structural Causal Model Approach

Exposure to air pollution rarely involves a single pollutant, as multiple pollutants typically originate from common emission sources. Despite this reality, previous research has primarily focused on single-pollutant exposure analyses, resulting in limited evidence on the health benefits associated with multipollutant emission reductions. Evaluating the effectiveness of interventions aimed at emission sources necessitates formulating appropriate research questions, accessing relevant data, and applying robust multipollutant analysis methods. Using health data from the Canadian Census Health and Environment Cohort (CanCHEC) and exposure data provided by Health Canada, we evaluate the impacts of electrified passenger vehicles and stricter diesel truck emission standards in Toronto. Specifically, we employe a two-step, hypothesis-driven approach to quantify the health benefits of reducing traffic-related PM1, NO2, and BC on nonaccidental and cardiovascular mortality risk over a 14-year follow-up period using the extended time-varying quantile g-computation (tvQGcomp) approach. Results from our simulation study indicate that the tvQGcomp method provides unbiased estimates of both independent and joint effects of multiple time-varying air pollutants, with reliable confidence interval coverage (~95%) and robust statistical power (type 1 error rate of 5% to 7%). We hypothesize that our novel analytical approach will accurately capture the health impacts of joint interventions on PM1, NO2, and BC. Our findings offer critical insights to inform evidence-based, policy-driven strategies aimed at mitigating adverse health impacts associated with traffic-related air pollution in Canada.

Juwel Rana, Department of Epidemiology, Biostatistics and Occupational Health, McGill University, Doctoral Candidate

The impact of ambient air pollution exposure on early-onset type II diabetes mellitus: A nested case-control study in a large Canadian cohort

Background: Early-onset type II diabetes mellitus (T2DM) is an increasingly prevalent condition associated with an elevated risk of comorbidities. Despite extensive evidence supporting an association between later-onset T2DM and ambient air pollution, the relationship among those with early-onset T2DM remains underexplored and presents a significant knowledge gap regarding the health impacts of environmental exposures. Objective: This study aimed to examine the association between air pollution and early-onset T2DM in a national cohort of Canadian adults. Methods: This nested case-control study used baseline (2008-2018) and follow-up (2016-2019) questionnaires of 327,821 Canadians to identify participants diagnosed with T2DM between 20 and 39 years of age. Cases were matched to four controls by sex, birth year and pollutant data availability using risk-set sampling. Odds ratios (OR) and 95% confidence intervals (CI) for the association between early-onset T2DM and fine particulate matter (PM2.5), nitrogen dioxide (NO2), and ozone (O3) exposure were estimated using conditional logistic regression models adjusted for other pollutants, sociodemographic, and environmental factors. Three-year averages ending in the diagnosis year of the matched case approximated long-term pollutant concentrations. Results: From this cohort, 711 eligible cases were matched to 2,844 controls. An increased odds of early-onset T2DM was observed from O3 concentrations of 20 ppb to 35 ppb (OR 3.28, 95% CI 1.20-8.96), but not from 35 ppb to 44 ppb (OR 0.72, 95% CI 0.30-1.69). Some evidence of an increased odds of this condition was observed per 10 ppb increase in NO2 concentrations (OR 1.22, 95% CI 0.95-1.56). Conclusion: This study contributes to the growing evidence supporting a relationship between air pollution and early-onset T2DM. Notably, an increased odds of early-onset T2DM was observed at O3 concentrations well below the Canadian Ambient Air Quality Standard clean air threshold. This highlights that additional research into health impacts of low-level pollutant exposure is necessary.

Taryn Thompson, Canadian Partnership for Tomorrow's Health (CanPath)

Ambient air pollution and the risk of epithelial ovarian cancer: a population-based case-control study

Background: Few ovarian cancers risk factors are known and the role of ambient air pollution remains understudied. Objective: To examine long-term exposure to ambient nitrogen dioxide (NO2) and fine particulate matter (PM2.5) in relation to epithelial ovarian cancer risk. Methods: We used data from a population-based case-control study in the greater Montreal area (Island of Montreal, North and South Shores), with 473 cases and 887 controls. Participants' residential postal codes at the time of study participation were linked to annual mean NO2 concentrations from a national land-use regression (LUR) model and to PM2.5 levels derived from a predictive model using multiple data sources, including satellite imagery. We used binary and multinomial logistic regression to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for overall ovarian cancer, and for borderline and invasive tumours separately. In a sensitivity analysis, we used NO2 concentrations from a LUR model specific to the Island of Montreal, based on dense monitoring surveys. Results: Though CIs were wide, the ORs suggested a positive association for PM2.5, and null association for NO2, with adjusted ORs (95% CIs) of 1.03 (0.93–1.13) and 0.99 (0.79–1.23) per interquartile range increment in ambient PM2.5 (0.2 µg/m3) and NO2 (9.6 ppb), respectively. The ORs (95% CIs) for NO2 and PM2.5, respectively, were 1.20 (0.82–1.76) and 1.07 (0.90–1.26) for borderline tumours, and 0.91 (0.71–1.17) and 1.01 (0.91–1.13) for invasive cancer. Using the NO2 estimates from the LUR model specific to the Island of Montreal, we found similar results. Conclusion: Our results may suggest that long-term exposure to ambient NO2 and PM2.5 may be associated with an increased risk of borderline, but not invasive, ovarian cancer. Larger studies with high-resolution PM2.5 exposure models and residential history matching the outcome's latency period are needed to confirm our findings.

Lysandre Viau

Framing Causal Questions in Observational Data: Insights from a Case Study

Background: Sports contribute to mental and physical well-being. Many challenges in healthcare also arise in sports analytics. Causal inference methods are widely used in health research to estimate intervention effects when randomization is infeasible. Similar challenges in sports analytics require careful analysis to address confounding and selection bias. Differences in methodological implementation can substantially impact causal estimates. Objectives: To illustrate the practical utility and nuance of causal inference techniques in observational settings, we present a case study that contrasts two common estimands: the Average Treatment Effect (ATE) and the Average Treatment Effect on the Treated (ATT). Although the application is drawn from sports, the methodological insights are broadly transferable to health data. Methods: Using observational play-by-play data from Shandong Taishan Luneng Football Club's 2017 season, we estimate the causal effect of a tactical decision—crossing the ball—on the subsequent creation of a shot. We apply distinct matching methods tailored to each estimand: propensity score matching for the ATE and ATT. Both approaches aim to reduce confounding between crossing and shot outcomes. Results: Our analysis estimates an ATE of 1.6%, indicating that crossing increases the probability of shot creation by 1.6 percentage points on average compared to not crossing. The ATT is higher, at 5.0%, suggesting that in scenarios where crossing was actually chosen, it was particularly effective. These differences underscore how each estimand answers distinct but complementary causal questions. Conclusion: This case study highlights the importance of clearly defining the causal estimand in observational research. Whether estimating the population-level impact of an intervention (ATE) or its effect among those who received it (ATT), different analytic strategies may be warranted. While demonstrated in a sports context, these methodological considerations are directly relevant to causal analyses in health and epidemiology.

Shomoita Alam, Postdoctoral Researcher

Exposure assessment of artificial light at night around the residence: uncertainty and susceptibility to misclassification bias

Background: Accurate exposure assessment is crucial in observational studies, and failure to account for measurement error can lead to biased results. This study aims at evaluating uncertainties in the assessment of residential exposure to artificial light at night (ALAN) and its sensitivity to measurement bias, when evaluating its role in prostate cancer risk. Methods: In 2005-2012, 1,931 incident prostate cancer cases and 1,994 controls were recruited in the PROtEuS population-based case-control study in Montreal. A multi-step calibration of satellite images of Montreal generated ALAN exposure metrics considering all light sources, including intensity, percentage of blue light, and Impact-MSI (intensity * % of blue light). ALAN metrics were linked to participants' residential addresses. Logistic regressions estimated odds ratios (OR) and 95% confidence intervals (CI) for prostate cancer while varying buffer sizes (from 50 to 200 meters) around residences. Models were adjusted for confounders identified through DAGs. The robustness of results to measurement bias was evaluated using E-values. Results: When comparing the highest versus lowest tertiles of ALAN exposure, ORs for prostate cancer risk varied by buffer size. For intensity, ORs increased from 1.52 (95% CI: 1.22-1.90) at 50m to 1.61 (95% CI: 1.28-2.03) at 200m. For blue light, ORs decreased from 0.79 (95% CI: 0.66-0.94) at 50m to 0.72 (95% CI: 0.60-0.85) at 200m. For Impact-MSI, they decreased from 1.38 (95% CI: 1.10-1.72) at 50m to 1.24 (95% CI: 0.98-1.56) at 200m. E-values were close to 1, indicating that results were vulnerable to measurement bias. Conclusion: Previous studies have used different buffer sizes. Our findings suggest that the observed associations between residential ALAN exposure and prostate cancer risk may be influenced by measurement error. The approach used to assess ALAN exposure offers a novel perspective, but uncertainties and susceptibility to bias necessitate careful interpretation and further validation to confirm its reliability.

Leslie Michele-ange Kouam Youogo, Institut national de la recherche scientifique, PhD student

Impact d’effets aléatoires et de conditions d’observation sur l’évaluation de la performance des chiens renifleurs dans la détection du virus du SARS-CoV-2

Contexte. Les chiens peuvent détecter des pathologies grâce à leur odorat très développé. Durant la pandémie de COVID-19, plusieurs études ont évalué la performance des chiens à détecter le SARS-CoV-2 comme option de dépistage rapide. Les approches statistiques utilisées ne prenaient pas en compte plusieurs sources de biais, faussant les résultats de la performance des chiens. Objectif. Évaluer l'impact d’ignorer la nature imparfaite du test RT-PCR dans la détection du SARS-CoV-2, d’effets aléatoires et de facteurs liés aux chiens et à l'observateur, sur l'estimation de la validité des chiens renifleurs à détecter les personnes infectées. Méthodes. Les participants (n=2354; âge≥12 ans) ont été recrutés en 2021 à Toronto. Chacun a été testé avec RT-PCR et a fourni trois échantillons de sueur. Trois chiens ont été entrainés à détecter les échantillons de personnes positives au SARS-CoV-2. Durant la phase de validation, 1260 observations ont été réalisées puis analysées par deux observateurs indépendants, en aveugle, à partir des enregistrements vidéo des séances de détection. Trois modèles bayésiens ont été appliqués pour estimer la validité des chiens à détecter le SARS-CoV-2 assumant que RT-PCR est parfait (M1), imparfait en ignorant (M2) et en considérant (M3) la variabilité due aux chiens et la dépendance créée par la réutilisation des mêmes échantillons et le visionnement des mêmes vidéos par plusieurs observateurs. Résultats. Les estimations ont varié entre 76,3% et 83,7% (M1), 75,3% et 84,5% (M2), 49,6% et 62,1% (M3) pour la sensibilité, et entre 73,9% et 79,3% M1), 57,8% et 87,4% (M2), 64,0% et 75,4% (M3) pour la spécificité. Conclusion. Le fait d’ignorer les effets aléatoires et des facteurs liés aux chiens et à l’observateur tend à surestimer la sensibilité des chiens à détecter SARS-CoV-2.

Fiston Ikwa Ndol Mbutiwi

Methodological Guidance for Individual Participants Data Meta-Analyses: A Systematic Review.

Background: Individual participant data meta-analysis (IPD-MA) is regarded as the gold standard in evidence synthesis, but it is resource intensive. While there is consensus on the items that should be reported, there is no consensus-based critical appraisal tool. Objective: To inform the development of a critical appraisal checklist, this review collated and summarized available methodological guidance on IPD-MA of randomized and observational studies. Methods: We followed the guidelines for Cochrane Methodology Reviews and reported following the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) 2020 guidance. We performed a comprehensive electronic search in ten literature databases from 1946 to June 2024. We included studies published in English that addressed any methodological guidance, and essential statistical and software requirements for IPD-MA. Data extraction focused on study characteristics, and the specific recommendations. Risk of bias was assessed using resources relevant to the study design. A thematic synthesis was performed to group recurring themes into domains. For each domain, signalling questions were generated to develop a preliminary list of items for assessment in an e-Delphi survey. Results: After screening 9436 unique abstracts and reviewing 286 full texts, we included 130 articles that met our inclusion criteria. These include Consensus papers, handbooks, critical reviews, empirical and simulation studies. The articles were published between 1995 and 2024, with most coming from the United Kingdom (48%), the United States (15%) and the Netherlands (12%). Most studies had a low risk of bias. We identified 14 domains relevant to conducting and reporting IPD-MA and categorized them into three sections. Conclusion: There are many recommendations in the literature on the general conduct of IPD-MA and on specific aspects of this research, which would benefit from consensus recommendation for all aspects of IPD-MA and critical appraisal of reports. This review provides many suggestions for these recommendations.

Edith Otalike, Western University, Graduate student

Detecting communities when order and direction matter

Background: There are limited algorithms for understanding communities in directed graphs. A novel algorithm combining both degree and betweenness centrality (“ig.degree.betweenness”) was developed to highlight gradients in connectivity. It identifies communities within complex directed graphs. These are networks that are comprised of actors who have ties that originate and end at themselves (self-loops). Objectives: Hierarchies in social partitioning for degree centrality (in-ties, out-ties) is evident among actors when applying the “ig.degree.betweenness” algorithm to social networks. This characteristic has useful application in epidemiological research. Methods: A simulated dataset of an infectious disease outbreak with its conjectured epicentre in Montréal is studied. Both the egocentric and sociocentric perspectives are investigated in a contact tracing approach among Canadian localities. Results: In the egocentric perspective, 362 individuals with a suspect infection resided at least one night in a facility tied to outbreak during an event week. Of these individuals, 188 relocated to 14 other Canadian localities, and 174 relocated within Montréal. In the sociocentric perspective that encompasses Canada, there were 389 suspect cases with 470 relocations among 16 localities. Application of the “ig.degree.betweenness” algorithm yielded eight contact tracing communities among these Canadian localities. A gradient was evident in connectivity for degree centrality among the communities. Conclusions: Community detection algorithms have been underutilized in epidemiological research. They provide insight on latent structures present in social networks. Our new algorithm reflects gradients in connectivity for complex directed graphs.

Benjamin Smith, McGill University Centre for Outcomes Research and Evaluation

Assessing the Effectiveness of Smoking Cessation Programs on Lung Function Decline: A Propensity Score and Mixed-Effects Model Approach

Background: Understanding the causal effect of smoking cessation interventions on lung function decline is challenging in observational studies due to confounding factors. Propensity Score (PS) methods can help address this issue by reducing bias in treatment effect estimation. Objectives: This study evaluates the effectiveness of PS matching in improving causal inference in the analysis of forced expiratory volume (FEV1) decline among smokers with mild obstructive pulmonary disease. Methods: We applied PS matching to balance baseline characteristics between intervention groups. Given the repeated-measures nature of the data, we implemented various linear mixed-effects models (LMMs), including linear, quadratic, spline, and random slope models. Model comparisons were conducted to determine the most suitable approach for analyzing FEV1 decline. Results: Our findings indicate that PS matching effectively reduces confounding bias, leading to improved causal estimation of smoking cessation interventions. Additionally, comparing different LMM specifications provided insights into the most appropriate model for assessing longitudinal changes in FEV1. Conclusion: Integrating PS analysis with LMM enhances causal interpretation in observational studies, offering a robust framework for evaluating healthcare interventions. These findings highlight the importance of PS methods in improving the validity of longitudinal analyses in medical research.

Mohammad Toranjsimin, University Of Saskatchewan

Development of a Novel Algorithm to Ascertain Cervical Cancer Incidence and Mortality Using Québec Administrative Health Data

Background: The absence of a linkable cancer registry poses a unique challenge for health services research in Québec. While previous algorithms for identifying cancer cases from provincial administrative data have been validated, none were specifically designed for cervical cancer (CC). Objectives: We developed an algorithm to ascertain incident CC cases and related deaths from 2012 to 2021 using data from provincial hospitalization records (MED-ECHO), physician billing (RAMQ), and death registry (RED-D). Methods: Unique patient IDs, diagnostic codes, hospital stay, and physician billing numbers were used to link records in RAMQ, RED-D, and MED-ECHO datasets. We used ICD 9/10 codes to identify CC cases and deaths across datasets. Since RAMQ codes are not validated, we developed an algorithm to identify cases within this dataset. Clinically relevant criteria, such as at least two diagnostic codes for CC and a provider specialty code for radiation oncology were applied for RAMQ patient inclusion. In the final, aggregated cohort, patients with an initial service date between 2012 and 2021 were included to exclude prevalent cases. We compared our results with estimates from the Québec Cancer Registry (QCR) for validation. Results: We identified 3901 incident cases; average annual age-standardized incidence rate was 8.89/100,000 person-years. In the QCR and our algorithm, age-standardized incidence rates followed similar trends over time from 2012-2019, whereas our cohort demonstrates a steady rebound in cases from 2020-2021 versus a dramatic rebound in 2021 in the QCR. We identified 685 deaths; average annual crude mortality rate was 0.83/100,000 person-years. Annual crude mortality rates were identical between the QCR and our algorithm. Conclusion: Our algorithm results are comparable to those of the QCR. To inform provincial intervention strategies, we will use our cohort to estimate the COVID-19 pandemic's impact on CC incidence, survival, and treatment.

Emma Wallens, McGill University, Division of Cancer Epidemiology

Infant mortality rates by immigration status among Black and White individuals in the United States

Background: While racial disparities in infant mortality in the United States (US) have been well established, the intersection between race and nativity status has not been well-studied in the context of infant mortality. Objective: We aimed to examine the association between nativity status and infant mortality among Black and White individuals in the US. Methods: We conducted a population-based, retrospective cohort study on US live births (2016-2022) with data obtained from the National Vital Statistics System linked Natality and Infant Death files. Maternal race and nativity status were self-identified and collected at time of birth. Infant death was defined as death within 364 days of life. Logistic regression was used to quantify the relationship between maternal nativity status and infant mortality among Black and White individuals, adjusting for maternal demographic and socioeconomic characteristics. Additional models were fit in cohorts restricted to preterm and term births. Results: Among 16,639,709 births, 21.6% and 78.4% were born to Black and White individuals, respectively. Overall, the rate of infant mortality was 5.5 per 1,000 births. Among Black individuals, the odds of infant mortality were higher among US-born compared to non-US-born individuals (10.6 vs 6.7 per 1,000; aOR: 1.52, 95% CI: 1.47-1.58). While the infant mortality rate was substantially lower, the same relationship was seen among White individuals (4.3 vs 3.0 per 1,000; aOR: 1.36, 95% CI: 1.31-1.42). When disaggregated into preterm and term cohorts, these patterns persisted among term births but were not apparent among preterm births. Conclusion: US-born individuals have higher odds of infant mortality in both Black and White individuals compared with non-US-born individuals. The rate of infant mortality is two-fold higher among Black individuals. These results highlight the impact of nativity status and race on infant mortality, emphasizing the need for further investigation into the underlying factors contributing to these disparities.

Nicolette Christodoulakis, McMaster University, Research Assistant

Assessing the Inclusion of Sexual and Gender Minority (SGM) Populations in Public Health Epidemiologic Surveillance: A Review of Ontario Data (2013–2024)

Background: Epidemiological surveillance is foundational to public health planning, resource allocation, and intervention design. Further, information contained in surveillance is often used by community-based agencies for planning services. Sexual and gender minority (SGM) populations have consistently shown health disparities in realms of physical, mental, and sexual health, with pronounced differences in health care utilization, necessitating inclusion in surveillance programs. The extent to which SGM populations are represented in these efforts remains unclear. This review examines approximately ten years (2013–2024) of public health epidemiologic surveillance data from Ontario's public health units to assess the inclusion of SGM populations in reporting and indicator tracking. Methods: A content analysis was conducted on public-facing online surveillance documents from Ontario's public health units, focusing on the presence of sexual orientation, gender identity and expression-specific data. Results: Findings reveal a consistent absence of SGM-specific data across surveillance documents. Few reports include SGM-relevant indicators, nor any data disaggregated by sexual or gender identity, even when health conditions are salient to these communities (e.g., sexual health indicators—such as STI rates, HIV prevalence, or PrEP uptake). Mental health data specific to SGM populations were similarly lacking. Equity considerations and social determinants of health were not applied through any SGM-relevant lenses, and there was no documentation of consultation with SGM communities or organizations in any of the surveillance processes. Furthermore, public health interventions targeting SGM groups were not tracked or evaluated, and no intersectional analyses (e.g., examining the role of race, disability, or socioeconomic status in SGM-specific health outcomes) were present. Conclusions: Ontario's public health surveillance tend to exclude SGM populations, hindering efforts toward health equity. To meaningfully address population health disparities, surveillance frameworks should integrate SGM-specific identities, consult affected communities, consider intersectionality in this work, and track relevant indicators and interventions through SGM-specific lenses.

Todd Coleman, Wilfrid Laurier University, Associate Professor

Causal diagrams for sexual and gender minority health disparities

Social epidemiologists have debated how to apply directed acyclic graphs (DAGs) when studying non-modifiable variables like gender/sex and race. Similar quandaries are relevant but remain unaddressed in sexual and gender minority (SGM) epidemiological research. SGM status is intrinsic and self-determined. By contrast, proximate constructs like SGM status disclosure and experiences of minority stress are malleable and implicated in causal mechanisms investigated in SGM disparity research. In this talk, we draw on recent empirical examples of SGM health research to consider ways in which SGM epidemiologists are employing DAGs as tools to strengthen causal inference. Integrating these examples, we then propose three solutions that SGM researchers can use when constructing DAGs or conceptual diagrams (Figure): 1. Reported SGM status can be conceived as an imperfect proxy for day-to-day disclosure of SGM status, thereby susceptible to a form of information bias, determined by characteristics such as age, race, place of origin, and early life socioeconomic status (SES). This is notably influenced by modality of data collection, whereby SGM community surveys and self-completed questionnaires are less prone to information bias than general population or interviewer-collected surveys. 2. External forms of stigma (e.g., harassment) can be conceived as 'exposure' variables of interest, given that these are modifiable through policies and campaigns to diminish structural or environmental stigma. SGM status (always imperfectly measured and unknowable to the researcher) is an antecedent component cause of this exposure but not a sufficient cause —in the same way racism (rather than race) is a fundamental cause of race-based health disparities. 3. The effect of non-specific stigma on health may be modified by SGM status, given literature demonstrating that SGM identity (esp. bisexual, gay/lesbian) may potentiate the negative effects of stigma on health, which vary among SGM subgroups.

Vandad Hazrati, Simon Fraser University , Research Assistant

Hysterectomy in women with a disability: A systematic review

Background: Hysterectomy is one of the most frequently performed gynecological procedures. While women with disabilities are known to face barriers to reproductive healthcare, little is known about how hysterectomy rates differ between women with and without disabilities. Objective: To synthesize the literature on the prevalence and risk of hysterectomy among women with disabilities, compared to women without disabilities. Methods: We searched the MEDLINE, Embase, PsycInfo, and CINAHL Plus databases from inception to May 2024 using validated search strategies for the concepts "disability" and "hysterectomy". We included peer-reviewed observational studies that compared the prevalence or risk of hysterectomy in women with and without physical, cognitive, sensory, and developmental disabilities. The Newcastle Ottawa Scale (NOS) was used for quality assessment. Findings were summarized narratively following the Synthesis Without Meta-Analysis guidelines. Results: The search yielded 3686 unique records, of which 5 studies met the inclusion criteria. Studies were cross-sectional (n=4) and retrospective cohort (n=1) in design, conducted in the US (n=3), Canada (n=1), and South Korea (n=1). All studies examined examined the exposure of "any disability" (n=31,214 individuals), with three studies disaggregating by disability type. Findings from four studies suggested that hysterectomy rates were higher among women with disabilities (range: 6.1% to 22.8%), compared to those without (range: 2.2% to 18.6%). Three studies suggested the disparity in hysterectomy was highest among younger women, aged <35 years. There was little evidence of variation in the outcome by disability type. Using the NOS, one study was high quality, while four were low quality due to limitations mostly related to measurement of the exposure and outcome. Conclusion: The limited research on hysterectomy among women with disabilities is concerning, particularly given the historical reproductive injustices faced by this population. Higher quality longitudinal research is needed to address this research gap to ensure equitable access to reproductive healthcare.

Jayati Khattar, University of Toronto

Health Status and Associated Factors Among Community-Dwelling Afro-Caribbean Black Canadians: A Cross-Sectional Comparison Before and During the Pandemic

Racial inequities can lead to health discrimination, lack of access to care and poor quality of care. The COVID-19 pandemic has exacerbated pre-existing disparities within marginalized communities. However, there is limited data focusing on Canadian Black populations. This study aims to assess how the COVID-19 pandemic impacted the health of Black communities and to identify associated factors prior to and during the pandemic. This community-based cross-sectional study included participants self-identifying as African/Caribbean/Black, living in the GTA. Data was collected on perceived health status, sociodemographic and clinical factors. Perceived general and mental health status, overall and by characteristics, both prior to and during the pandemic was described. Key factors associated with perceived health were explored using multivariable logistic analysis. 388 individuals were included in the study, mostly English-speaking and non-Canadian- born. Respectively 81.4% and 76% indicated their general and mental health as good or excellent before the pandemic, compared to only 48.7% and 44.6% during the pandemic. University education (OR=3.25), physical activity (OR= 2.87) and multimorbidity (OR= 0.15) were significantly associated with self-reported general health before the pandemic, while immigration status, age, employment status and insurance coverage, contributed to mental health perception. Women reported 50-60% less often than men that their general or mental health was good/excellent during the pandemic. Multimorbidity, immigration status, and household income were also associated with general health. French-speaking Black Canadians reported a lower proportion of good/excellent mental health, but those privately insured or physically active reported 3 times higher proportions of good /excellent mental health during the pandemic. This study provides needed information on health status in a community-based sample of Black Canadians and explores how social determinants of health vary in different contexts and situations. The community involvement and inquiring about how participants felt before and during the pandemic, contributed to strengthen this cross-sectional study.

Anna K, Lakehead University, Associate Professor

Inequalities in preterm birth among immigrants to Canada by race and time since immigration: a population-based repeated cross-sectional study

Background: The risk of preterm birth (PTB; < 37 weeks' gestation) is lower among immigrants compared to the Canadian-born population. However, most studies treat immigrants as a singular group, potentially masking inequalities within the immigrant population. Objectives: We examined the risk of PTB in Canadian immigrants across multiple self-identified racial groups and years since immigration. Methods: We used the 2006 and 2011 cycles of the Canadian Census Health and Environment Cohorts, a population-based dataset combining sociodemographic characteristics and administrative health data. We compared the risk of PTB between immigrants and Canadian-born women overall and by self-identified racial group (White, Black, East/Southeast Asian, Latinx, Middle Eastern). We modeled the probability of PTB as a function of time since immigration using survey-weighted logistic regression models adjusted for maternal age, province/territory and delivery year. Restricted cubic splines captured non-linear relationships and confidence intervals were estimated using bootstrap replicate weights. Results: Immigrants accounted for 22% of the 2,397,410 (weighted) total pregnancies. Overall, the risk of PTB was similar between immigrants and non-immigrants [RD: -0.04, 95% CI: -0.26, 0.18]. Yet, within self-identified racial groups, the risk of PTB was generally lower among immigrants compared to those Canadian-born. Recent immigrants (< 6 years) had a lower probability of PTB compared to their Canadian-born counterparts, but the advantages diminished over time. By 20 years since arrival, most racial groups displayed probabilities of PTB comparable to the equivalent Canadian-born group. However, for Black immigrants, the probability of PTB surpassed that of the Canadian-born Black population around 16 years following immigration. Conclusion: Canadian immigrants were at a lower risk of PTB, but the risk converged with their Canadian-born counterparts after 11-20 years since immigration. This pattern was similar across self-identified racial groups, except for Black immigrants whose probability of PTB surpassed their Canadian-born counterparts after 16 years.

Rina Lall, McGill University

Evaluated measures of sex and gender for health research: A scoping review

Background Though frequently conflated, sex and gender are distinct and important social determinants of health. Sex is assigned based on genetic and physiological profiles. Gender encompasses socially constructed norms and roles expected of women, men, girls and boys. Gender identity – a dimension of gender – describes how individuals self-identify relative to the gender spectrum from masculinity to femininity. The conflation of sex and gender undermines the precision of measurement tools. Accurate identification of gender is imperative to uncover health inequalities in cis and trans populations. Objectives This scoping review compares evaluated prospective measures of sex and gender used in health research and administrative databases. Methods For this review, we search PubMed using terms related to sex, gender (identity, cis, trans), data collection, and evaluation. We included measures that could identify distinct sexes and/or gender identities, and had undergone qualitative and/or quantitative assessments. Articles were screened, and data were extracted and synthesized by measurement tool type. Results The search identified 1,005 studies, and 7 were included. Five types of measures were extracted and summarized, including 3 variations of single-item gender measures, the two-step gender identity and sex assigned at birth measure (TSM), and the multidimensional sex and gender measure (MSGM). Unlike the single-item questions, the TSM can ascertain cis and trans identities. The MSGM demonstrated high quantitative agreement with the TSM; however, concerns were raised regarding the clarity of the gender item and assumptions. During cognitive validations, trans respondents generally reported more discomfort than their cis counterparts. Conclusion Researchers should carefully assess their objectives to accurately capture relevant sex and gender dimensions based on their study questions. We recommend using the TSM at a minimum for collecting and reporting sex and gender data. Response options for sex and gender items should be tailored to the study region and population.

Ezinne Ndukwe, Women's College Hospital, Research

Representativeness of Vulnerable Populations in Randomized Controlled Trials Evaluating the Efficacy and Safety of SGLT-2 Inhibitors: A Systematic Review and Meta-analysis

Background RCTs have shown that SGLT-2 inhibitors benefit patients with type 2 diabetes and heart failure. However, vulnerable populations—children, older adults, women, racial and ethnic minorities, and patients with chronic kidney or liver disease— may be underrepresented in these trials, posing a challenge to the generalizability. Objectives We conducted a systematic review and meta-analysis to assess the pooled prevalence of the vulnerable populations in SGLT-2 inhibitor RCTs across different indications and to identify influential factors. Methods We searched Central, Medline, and Embase to identify all relevant studies until January 8, 2025. Studies published phase 3 or 4 RCTs (300 participants or more) of SGLT-2 inhibitors and reported the number of participants in any vulnerable population group were included. We calculated the pooled prevalence with a 95 % confidence interval of each vulnerable population. Heterogeneity was explored using random-effects meta-regression. The subgroup characteristics were selected based on their epidemiological relevance. Results In 91 included RCTs, the pooled prevalence was 42.1% for females (95% CI 40.2% to 44.1%), 42.3% for older adults (95% CI 36.4% to 48.2%, 28 RCTs), 33.7% for patients with CKD (95% CI 20.9% to 47.9%, 37 RCTs), 4.8% for Black participants (95% CI 4.2% to 5.4%, 72 RCTs), 17.2% for Asians (95% CI 13.5% to 21.3%, 75 RCTs), 1.7% for Indigenous (95% CI 0.7% to 3.1%, 19 RCTs), and 20.0% for Hispanic or Latinos (95% CI 13.4% to 27.6%, 16 RCTs). Data for liver disease and participants under 18 were insufficient. The study population and number of trial centers may significantly influence the inclusion of these vulnerable populations. Conclusions The findings revealed that vulnerable populations were underrepresented in SGLT-2 inhibitor RCTs, which could impact the generalizability of the findings. Efforts should be made to improve the inclusion of these groups to ensure the broader applicability of results.

Mohammad Ali Omrani, Western University

Polymorphisms in the GSTA1 and UGT2B17 Genes, Estrogen Levels, and Menopause-Related Side Effects in Post-Menopausal Women in the MAP.3 Trial

Background: Exemestane (EXE) is an aromatase inhibitor that reduces breast cancer risk in post-menopausal women but can cause menopause-related toxicities, including fatigue, hot flashes, and joint pain. Genetic polymorphisms in GSTA1 and UGT2B17 may influence estrogen metabolism, potentially exacerbating toxicity severity. Better understanding these genetic influences could help personalize breast cancer prevention strategies. Objectives: Among women randomized to EXE in the MAP.3 trial, this study aims to: 1.Assess the association between GSTA1 polymorphisms, and estrone (E1) and estradiol (E2) levels at a) baseline and b) 1 year follow-up. 2.Examine the relationship between GSTA1 polymorphisms and menopause-related toxicities up to 1 and 5 years follow-up. 3.Evaluate the interaction between GSTA1 and UGT2B17 polymorphisms on menopause-related toxicities up to 1 and 5 years follow-up. Methods: A nested cohort study was conducted within MAP.3, a double-blind, placebo-controlled phase III trial. GSTA1 and UGT2B17 polymorphisms were identified using TaqMan single nucleotide polymorphism assays. Estrogen levels were measured via liquid chromatography–mass spectrometry, and toxicities were assessed using the Common Terminology Criteria for Adverse Events v3.0 criteria. Linear regression was used to analyze the association between GSTA1 and baseline estrogen levels. Log-binomial regression was used to examine the relationship between genotypes and substantial estrogen suppression at year 1. Logistic regression was used to examine menopause-related toxicities. Race was the only confounder identified a priori. Results: There was no significant difference in mean E1 and E2 levels by GSTA1 at baseline. At 1 year, women with the GSTA1 *B/*B genotype had an increased risk of extreme E2 suppression compared to the *A/*A wildtype group (RR: 1.50, 95% CI: 1.14 to 1.92). Those with the GSTA1 *A/*B or *B/*B genotypes had a higher odds of experiencing severe joint pain up to 1-year follow-up compared to the *A/*A wildtype group (OR: 4.91, 95% CI: 1.50 to 16.11), and this was further increased for those who also had the UGT2B17 *2/*2 deletion polymorphism (OR: 6.63, 95% CI: 1.70 to 25.80). Those with the GSTA1 *A/*B or *B/*B genotypes also experienced a higher but insignificant odds of fatigue, that was further increased in those who also had the UGT2B17 *2/*2 genotype. Conclusions: Those with the GSTA1 *B/*B genotype had a higher risk of substantial E2 suppression. The odds of experiencing severe fatigue or joint pain after starting EXE was higher among those with the GSTA1 *A/*B or *B/*B genotype and was highest in the presence of the UGT2B17 (*2/*2) double deletion polymorphism.

Marisa Deodat, Queen's University

Association entre l’indice de masse corporelle et la méthylation de l’ADN dans les tissus adipeux mammaires chez les femmes atteintes d’un cancer du sein

Contexte: L'obésité, définie par l'indice de masse corporelle (IMC), est un facteur de risque et de pronostic du cancer du sein. Elle semble associée à des changements dans la méthylation de l'ADN (mADN), une modification épigénétique importante dans le développement et la progression du cancer. Étudier la relation entre l'IMC et la mADN dans le tissu adipeux mammaire permettrait de mieux comprendre leur implication dans le cancer du sein. Objectif: Évaluer l’association entre l’IMC et les niveaux de mADN globaux et spécifiques à des sites dans les tissus adipeux mammaires sains de femmes atteintes du cancer du sein. Méthodes: Cette étude est menée chez160 femmes atteintes d’un cancer du sein. L’IMC a été calculé en divisant le poids (kg) par la taille (m) au carré mesurés par une infirmière de recherche. Les niveaux de mADN ont été mesurés par des puces Infinium MethylationEPIC. La relation entre l’IMC et les valeurs M de mDNA a été modélisée par des régressions linéaires multiples corrigée par la méthode de Benjamini-Hochberg. L’analyse des voies de signalisation a été réalisée avec KEGG. Résultats: L’IMC n’était pas statistiquement associé aux niveaux globaux de mADN (p=0,0882). Nous avons observé que l’IMC était associé à 57 504 sites (p<0,05). Nous avons identifié 18 voies de signalisation avec un nombre statistiquement significatif de gènes dont la mADN était associée à l’IMC, des voies impliquées dans le cancer, l’insuline et l’inflammation. Conclusion: Nos résultats suggèrent que l’IMC est associé à la mADN dans les tissus mammaires adipeux sains, en particulier des sites situés dans les voies de signalisation de l’inflammation et de l’insuline.

Caroline Diorio

Examining the Relationship Between Alcohol Metabolism, Genetic Variation and Colorectal Cancer

Objective: To identify genetic variants related to alcohol metabolism that are associated with colorectal cancer (CRC) and examine if there are distributional differences that can explain the high rates of CRC observed in Atlantic Canada. Methods: Data from the Canadian Partnership for Tomorrow’s Health (CanPath) were used in a nested case-control study that involved approximately 600 cases and 1,900 controls from the Atlantic and BC cohorts. Participants were genotyped and multivariable logistic regression was used to estimate the odds ratio (OR) and 95% confidence intervals (CI) for 953 genetic variants across three gene groups (ADH, ALDH, CYP2E1), which were then corrected for the false discovery rate using the Benjamin-Hochberg procedure. Results: Seven genetic variants from the ADH (n=1) and ALDH (n=6) gene groups exhibited strong associations with CRC that remained significant after correcting for the false discovery rate. The SNP rs76830434 (ALDH1B1) exhibited an increased risk for CRC (OR = 5.45, 95% CI = 2.45 to 12.21, p = 0.002), while protective associations were also observed for the remaining 6 SNPs. Moreover, regional differences in allele frequencies between the Atlantic Canada and BC cohorts showed significant variation in the frequency of each SNP, including rs76830434. Conclusion: The study suggests that genetic variants in alcohol metabolism genes, particularly those in the ALDH family, may contribute to CRC risk in Atlantic Canada. Additionally, differences in the prevalence of these alleles may help explain the high rates of CRC observed in the region. These findings support the importance of genetic testing in CRC risk assessment, particularly in high-risk populations.

Derrick Lee, St. Francis Xavier University, Associate Professor

Identification of Common Hub Genes in Esophageal and Gastric Adenocarcinoma Using (WGCNA)

Background: Esophageal and gastric adenocarcinomas are among the most aggressive cancers, often diagnosed at advanced stages due to the lack of effective early biomarkers. These late-stage diagnoses result in poor prognoses, with survival rates as low as 20%. Identifying shared biomarkers could revolutionize early detection and improve survival rates. Objectives: This study aimed to identify common hub genes in esophageal and gastric adenocarcinomas using Weighted Gene Co-expression Network Analysis (WGCNA). Methods: Using publicly available mRNA expression data, WGCNA was performed to identify clusters of co-expressed genes (modules) and hub genes within these modules. Statistical significance was assessed using an adjusted p-value threshold of <0.05. The analysis focused on identifying robust biomarkers for early detection. Results: Several hub genes were identified, demonstrating their potential as shared biomarkers for early diagnosis of esophageal and gastric adenocarcinomas. These biomarkers could increase survival rates from 20% (late-stage) to 80% (early-stage) and reduce the burden of advanced cancer treatment. Conclusion: This study highlights the potential of using WGCNA to identify biomarkers for early cancer detection. These findings have significant implications for public health by improving screening protocols, especially in high-risk regions. Future work will validate these biomarkers in clinical settings and develop non-invasive diagnostic tools.

Yamen Shahwan

Scoping Review on the Genital Bacterial Microbiome in Heterosexual Partners

Background: Microbial interactions between heterosexual partners influence susceptibility to sexually transmitted infections. However, most research on genital microbiome dynamics has focused on individuals rather than couples. Objective: We reviewed evidence on genital microbial composition and inter-partner microbial interactions in heterosexual couples. Methods: On July 24, 2024, we systematically searched Medline, Scopus, and Web of Science for studies on the genital microbiomes of heterosexual couples. We excluded studies involving non-human subjects, review articles, non-peer-reviewed publications, and those not using 16S rRNA sequencing. Two reviewers independently screened titles/abstracts for relevance and evaluated full texts for inclusion, resolving disagreements through discussion. Data extracted included study and population characteristics, co-infections (e.g., bacterial vaginosis, BV, herpes simplex type 2, HSV2), bacterial composition, and diversity measures. Results: Of the 870 records identified, 10 studies were eligible after full-text screening: 4 cross-sectional, 1 case report, 3 interventional, and 2 longitudinal. These studies, published between 2016 and 2023, were from the USA (n=1), Pakistan (n=1), Spain (n=2), Australia (n=3), and Kenya (n=3), and included 1 to 252 couples, with median ages of 22-35 for females and 24-36 for males. Six studies used self-collected samples while four studies used clinician-collected samples. Most studies (n=8) targeted V3-V4 hyper-variable regions for bacterial sequencing, while one focused on V4 and another on V4-V6. All but one case report found low diversity Lactobacillus-dominated microbiota in healthy females, while males had a more diverse microbiome. Seven studies identified a correlation between penile bacterial taxa and female BV status. Two studies noted significant differences in microbial composition due to the partner's HSV-2 status and two observed microbial composition changes before and after sexual intercourse. Conclusion: While data extraction continues, the limited couple-based studies highlight the need for larger, standardized studies to better understand inter-partner genital microbiome dynamics and their impact on sexual health.

Chang Sun, McGill University

Characterization of homozygosity by descent in the Canadian Longitudinal Study on Aging

Background: Homozygosity by descent (HBD) occurs when an individual inherits two identical copies of a gene descended from a common ancestor. Increased levels of HBD have been associated with health-related phenotypes. Objective: The Canadian Longitudinal Study on Aging (CLSA) contains participants from the Quebec and Newfoundland founder populations, where more HBD is expected. Large-scale studies of HBD in humans from both founders and outbred populations are limited. We aimed to characterize HBD levels in the CLSA to capture a broad range of HBD. Methods: Our analysis included ~400,000 single-nucleotide polymorphisms (SNP) from 23,015 CLSA individuals of European ancestry. HBD was measured using runs of homozygosity (ROHs: long contiguous stretches of homozygous genotypes along the genome), identified through a Hidden Markov Model implemented in IBDLD. HBD status at each SNP was determined based on an IBDLD-estimated HBD probability ≥0.8. Different minimum ROH lengths were compared: >500 kb, >1,000 kb and >1,500 kb. Genome-wide HBD was measured as the proportion of the genome covered with ROHs. HBD levels were compared by age, sex, and province. Results: We identified 84,469 ROHs >500 kb from 22,039 (96%) individuals. On average, each participant had 3.7 ROHs (median length=1,052 kb, IQR=1,075 kb). At the higher ROH cut-offs, only 81% and 60% of individuals had ROH segments >1,000 kb and >1,500 kb, respectively. Descriptive analyses were based on ROHs >500 kb. Genome-wide HBD was higher in older individuals ($P<0.001$), and the two founder populations ($P<0.005$). There was no significant difference between males and females. The number of ROHs was highest on chromosomes 1-3 and 6, and ROH lengths were longest on chromosome 11. Conclusion: We highlighted differences in ROHs across subpopulations of the CLSA and identified potential regions for investigating HBD hotspots. These results will guide future association studies between HBD levels and health-related phenotypes.

Emily Tran

Finding Genetic Contributors to Parkinson’s Disease via Weighted Gene Co-expression Network Analysis

Background: As the second most prevalent progressive neurodegenerative disorder, Parkinson’s disease (PD) involves complex pathological processes and lacks definitive diagnostic biomarkers. This study aimed to explore molecular signatures associated with PD to support improved diagnostic and therapeutic strategies for PD patients. Methods: Gene expression profiles from GSE202667 dataset (platform: GPL20844) were obtained from the Gene Expression Omnibus (GEO) database. Differentially expressed genes (DEGs) between PD and control samples was assessed using the “limma” package in R software. We used Weighted Gene Co-expression Network Analysis (WGCNA) to construct co-expression networks and evaluate their correlation. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway were performed to explore biological correlations. Hub genes were validated using an independent dataset (GSE54536). Results: A total of 365 common DEGs were identified. WGCNA revealed 4 co-expression modules, with the eigenvalues of the blue module most significantly with PD stages ($r=0.78$, $P<0.001$). Key genes from this module were analyzed using protein-protein interaction (PPI) networks and CytoHubba algorithm. Eight potential hub genes, including LILRB4, LILRB2, FCGR2A, FCGR2B, CCR1, TLR4, ITGAX, and NCAM1, were identified, of which FCGR2A and FCGR2B were validated as consistently upregulated in PD across datasets. Conclusions: FCGR2A and FCGR2B may serve as immune-related molecular indicators of PD, suggesting a potential role in disease progression and as candidates for further clinical diagnostic and therapeutic development. Further studies with larger and experimentally enriched datasets are recommended.

Sara Khademioureh, University Of Alberta

A multi-state transition model of changes among community-dwelling older adults receiving home care services: a population-based cohort study in Quebec

Background. Home care is crucial in preventing health deterioration and deconditioning in older adults experiencing loss of autonomy. They often experience multiple care transitions, leading to negative consequences such as adverse health outcomes. This project leverages health administrative data and a transition analysis method still underused in health care research to better understand the transition process of seniors with autonomy loss across the entire continuum of care, a largely understudied subject. Objectives. 1) Describe the observed care transitions experienced by home care services recipients during their follow-up; 2) Estimate longitudinal care transition probabilities in home care services recipients. Methods. This is a retrospective cohort study of home care recipients, using Quebec health administrative data (2012-2015). We used a continuous-time multistate Markov model with Cox models (adjusting for home care type and intensity) to estimate and illustrate the variation in transition probabilities over time across five states: 1) Home; 2) Waiting for long-term care at home; 3) Hospital stay; 4) Long-term care; 5) Death. Results. The median follow-up was 1012 days (2.8 years). Men were sicker and had a higher mortality rate than women (45.0% vs. 31.9%). The 3424 individuals in our study cohort experienced 14,792 transitions during the follow-up period, with the vast majority (76%) of transitions being from home to hospital and vice versa. Of the 1245 deaths recorded, half occurred in hospitals, and nearly one-quarter came from LTC facilities. Individuals waiting at home for LTC placement had a high probability (74%) of hospital stay, and dementia was associated with this transition. Cancer diagnosis was associated with the probability of dying at home. Conclusion. This study uncovers new patterns in care transitions for older adults with autonomy loss, offering valuable insights. These findings provide an opportunity to develop tailored interventions that enhance continuity and safety in home care services.

Isabelle Dufour, Université de sherbrooke, professeure

One Size Fits None. How can we do better? Using Patient Reported Experience Measure findings to drive local quality improvement across wards in a large Australian metropolitan hospital

Background: Patient reported experience measures (PREMs) are being collected across entire jurisdictions, resulting in large volumes of rich qualitative patient feedback. However, this collection of data is often not connecting with local quality improvement efforts. Objectives: This study aims to answer the question: “Are there meaningful differences in the patient experience of care, as measured through qualitative survey feedback, among wards at a large metropolitan hospital?” to assess the need to analyse PREMs data at a ward level to identify actionable insights. Methods: We utilise 6-months of PREMs surveys from a jurisdictional level survey in a large metropolitan hospital in Australia. Responses to two qualitative questions were analysed: (i) what was good about their care, and (ii) what could be improved about their care. Content analysis was conducted using a semi-automated machine learning based tool, Leximancer. We performed a quantitative comparison between the hospital wards of the concepts identified from the text and their frequencies, and a qualitative comparison between wards of the three most prevalent concepts and the details reported by patients. Results: In the quantitative comparison, we found a moderate association of the concepts reported between the wards (Cramer’s V: 0.36-0.67). The qualitative analysis showed that even when the high-level issue being reported was shared across wards, the nuances often differed, especially for feedback related to improvements in care. Conclusion: Our study found substantial differences between the issues and details reported by patients across different wards, highlighting the importance of analysing PREMs at a ward level to inform quality improvement. We demonstrated a standardised way to analyse this data at ward level by employing semi-automated content analysis using machine learning technology. These findings provide a clear method that health services can use to analyse PREMs data to drive on-the-ground quality improvement for patients.

Teyl Engstrom, Queensland Digital Health Centre, The University of Queensland, Principal Research Scientist

Validation of a set of quality indicators for older adults hospitalized for injuries

Introduction: Assessing the quality of care in trauma systems is essential to identify areas needing improvement. However, although older people account for >50% of admissions and adverse health outcomes are more frequent in this population, most trauma systems do not use quality indicators specific to this population. Objective: We aim to validate a set of quality indicators for geriatric trauma. Methodology: We conducted a retrospective cohort study of patients aged ≥65 admitted to a trauma center in Quebec (2013-2020). Using the Quebec Trauma Registry, we measured six indicators from a recent consensus study: surgical delay for hip fractures, management by a geriatric specialist, access to rehabilitation and screening for malnutrition, pressure ulcer and discharge destination. Adherence was measured for patients with an injury severity ≥ 2 on the Abbreviated Injury Scale and a length of stay ≥ 3 days. Multi-level logistic regression models with a random effect on trauma centres were used to estimate adherence in each centre. Stratified analyses were performed based on age, frailty risk, and designation level. Preliminary results: A total of 75 191 people from 57 trauma centers were included. Global adherence was 13% for management by a geriatric expert, 20% for malnutrition screening, 61% for surgical delay <36h in hip fracture patients and 86% for access to rehabilitation. Significant variations were observed between centers of the same level for all process indicators. Adherence was generally better for older and more frail patients and in centers with a higher designation level. Pressure ulcers were reported in only 2% of patients, and 53% had a favourable discharge destination Conclusion: Preliminary analyses show low to moderate adherence to indicators, as well as variations in practice, suggesting that there is potential for improving the quality of care for elderly trauma patients.

Marianne Giroux, CRCHUQ, Graduate Student

Cost-Effectiveness of timely surgery and timely inpatient rehabilitation for the management of hip fracture

Background: Hip fractures impose a poor prognosis and high healthcare costs among the elderly population, including permanent impairment of functioning, institutionalization in long-term care, mortality. Ensuring that patients receive timely surgery and post-discharge rehabilitation can improve prognosis. Objectives: Determine whether providing timely surgery within 24 hours of emergency department admission, timely admission to inpatient rehabilitation post-acute discharge, both, or receiving surgery beyond 24 hours and the absence of or delayed admission to inpatient rehabilitation, would be cost-effective management strategies for patients who experienced hip fractures. Methods: Using a Markov cohort model, quality-adjusted-life-years (QALYs) and costs were evaluated over a 5-year time horizon, discounted at 3.5%. State-transition probabilities and costs were obtained from regression models fitted using linked administrative datasets. EQ-5D utility values were obtained from an international prospective observational study. We performed base-case and probabilistic sensitivity analysis using 5,000 simulations to estimate the cost-effectiveness of each strategy at willingness-of-pay from $0 to $300,000. Results: The incremental-cost-effectiveness-ratio of timely surgery alone, timely rehabilitation, and both, compared to neither were savings of $39,225, and costs of $124,162 and $83,714 per QALY, respectively. Five-year base-case costs ranged from $130,747 to $156,848, and QALYs from 2.13 to 2.37. Timely surgery alone had the highest probability of being cost-effective up to a willingness-to-pay threshold of $128,000 per QALY and the combination of timely surgery and inpatient rehabilitation had the highest probability of being cost-effective after willingness-to-pay threshold of $130,000 per QALY. Conclusion: Achieving timely access to surgery can improve patients' quality-of-life and reduce health system costs. Providing both timely surgery and inpatient rehabilitation yields greater QALYs but incurs a larger health systems cost; further stakeholder engagement can inform the acceptability of its incremental cost-effectiveness.

Jimmy Hu, Trillium Health Partners, Biostatistician

Determining the diagnostic interval using administrative health data in a cohort of children with leukemia

Background: Childhood cancer is a leading cause of disease-related death among Canadian children. Time-to-diagnosis is an important metric in cancer care, as delays may affect care experience, disease course, and outcomes. In the absence of a standardized cancer registry that captures care metrics, administrative health data can be leveraged to provide insight into care pathways. Objectives: We aimed to identify the first health care encounter within the diagnostic interval (i.e., time-to-diagnosis) and determine its duration in children diagnosed with leukemia in Quebec between 2012 and 2022, using a data-driven approach. Methods: We utilized population-based administrative health data from Quebec, including physician claims, hospitalizations, diagnostic records, and vital statistics, to identify and categorize leukemia-related healthcare encounters in the two years before diagnosis. Encounters occurring more frequently in the three months preceding diagnosis, compared to the 18 to 24-months prior, were categorized as leukemia-related. To derive the lookback period for each leukemia-related healthcare encounter category, we used statistical process control charts and validated the findings using an established algorithm. Control charts are frequently used to distinguish variation in data due to common causes from variation attributable to assignable causes. The earliest leukemia-related healthcare encounter indicated the start of the diagnostic interval, while the most definitive diagnostic procedure marked its end. Results: We identified 819 children diagnosed with leukemia (44% female, 56% male). The median age at diagnosis was 5.6 years. The median diagnostic interval was 11 days (25th-75th percentiles: 3–57 days). The most common first healthcare encounter was a specialist consultation, and infectious diseases were the most frequently assigned diagnostic codes at first contact. Conclusions: Control chart methods are effective for evaluating time to diagnosis. This methodology is versatile and can be used to describe the diagnostic pathway, including route to diagnosis and the first healthcare encounter for underlying cancer.

Callum Mullen, McGill University, Division of Cancer Epidemiology

Can Blood Donor Research Contribute to the Study of Obesity Epidemiology?

Background: Rising obesity rates are associated with a range of chronic conditions including heart disease, cancer and dementia. Many people with obesity-related metabolic syndrome such as diabetes, hypertension and dyslipidemia are eligible to donate blood. Donors may be a valuable resource for health system research but a healthy donor effect may limit generalizability. However, as chronic disease does not appear until mid-life or later, the healthy donor effect may be more evident in research involving older donors. Objectives: To describe blood donor overweight/obesity rates and self-reported health relative to general population. Methods: In 2024, 6,376 blood donors of 30,000 (21.3%) completed an online survey asking for height, body weight and general health rated on a 5-point scale from poor to excellent. General population data were extracted from published reports for 2022. Overweight/obese was defined as 25 + kg/m2. All data were weighted to represent general population demographics. Percentages and 95% confidence intervals were calculated. Results: The percentage of donors overweight/obese (65.0% (63.8-66.3)) was similar to general population (64.7% (64.68-64.72)). Donors who rated their health as very good/excellent were similar to general population up to age 35-49 (donors 62.3% (59.8-64.8) vs general population 64.6% (63.1-66.1)), but more donors aged 50 – 64 rated their health as very good/excellent (donors 65.2%(63.3–67.2) vs general population 57.1% (55.7-58.6)) with the gap widening in older age groups. Conclusion: Donors are similar to the general population for the percentage overweight/obese, but by 50 years of age there may be some attrition of less healthy donors. As chronic disease is developing from a young age, donors under 50 years old may be well suited to study lifestyle and biomarkers prior to the onset of illness. Data interpretation of donors over 50 should consider a potential healthy donor effect.

Sheila O'Brien, Canadian Blood Services, Associate Director, Epidemiology and Surveillance

How hospital system issues affect patient safety: lessons learned from medico-legal complaints

Background: The Canadian healthcare system has significant challenges, including resource scarcity and wait times in hospitals, which may impact care access and quality, posing potential risks to patient safety. Objectives: Using medical professional liability data, we assessed whether hospital system issues of excessive wait times or healthcare resource constraints were associated with patients experiencing a healthcare-associated harmful incident and whether that harm was more severe. Methods: The Canadian Medical Protective Association maintains a repository of medico-legal cases, including civil legal actions, hospital and regulatory College complaints. The study sample included cases closed between 2020 and 2024, with care accessed in a hospital. Using an in-house developed contributing factor framework, wait time and resource system issues were identified through medico-legal file review and text analytics. Two multivariate regressions were performed to assess associations between system issues and 1) the presence of harmful incidents and 2) harm severity, an ordinal outcome. Analyses controlled for physician specialty, patient age, care location and other contributing factors. Results: The study sample of 5,319 cases included 497 cases with system issues. In multivariate analyses, the presence of system issues was significantly associated with patients experiencing harmful incidents ($p<0.0001$), and more specifically with patients experiencing mild or moderate harm ($p=0.008$) or severe harm or death ($p<0.0001$) compared to no harm . Additionally, a significantly higher likelihood of harmful incidents was identified in cases with care in emergency or diagnostic imaging departments, deficiency in patient monitoring or follow-up, inadequate communication between physicians and patients or between physicians and other healthcare providers. Conclusion: Excessive wait times or insufficient resources in hospitals were significantly associated with greater likelihood of both patient harm and increased harm severity in our study. Medical professional liability data is a unique data source from which to generate insight, helping to identify opportunities for healthcare improvements.

Elaine Rose, The Canadian Medical Protective Association, Statistician

Spillover Effects of Organized Cancer Screening Programs

Background: Organized cancer screening programs lead to higher screening uptake, higher cancer detection rates, and decreased mortality. While screening programs promote the use of a specific service, they may also prompt the patient or physician to initiate unrelated health service use. Objectives: We investigate service spillover effects of provincial organized colorectal cancer screening programs in Canada aiming to increase uptake of at-home fecal occult blood tests. We disentangle patient-initiated and physician-initiated spillovers by analyzing different recruitment strategies. Methods: We use a staggered difference-in-differences approach to investigate effects of screening program implementation on unrelated health service use. We analyze (1) programs recruiting eligible patients by mailing screening test kits (Manitoba, Saskatchewan, Nova Scotia); (2) programs recruiting through referral (Alberta). We use the Canadian Community and Health Survey with a sample of eligible individuals aged 50-74 in the period 2001-2012. The outcomes of interest are number of visits to a family physician, eye specialist, dentist, other medical doctor, and nurse, as well as receiving a flu vaccine. Results: We find that the mail-based programs had a negative effect on family physician visits (-5%), and a positive effect on receiving a flu vaccine (+6%). Moreover, we find that the referral-based program had positive effects on eye specialist visits (+9%), and other medical doctor visits (+13%). The results suggest that screening programs targeting eligible patients directly have spillover effects on getting a flu vaccine, which can easily be initiated by the patient themselves. Physician-based screening programs show spillover effects onto other doctor visits, thus likely capturing physician-initiated spillovers. Conclusion: While programs recruiting patients directly have spillovers on low threshold services (flu vaccines) programs recruiting via referral have physician-initiated spillovers (other doctor visits).

Erin Strumpf, McGill University, Professor

Emergency Department and Primary Care Visits for Dental Problems Not Associated with Trauma Among Registered Métis Citizens of Ontario

Background: Dental care access is a significant issue for Indigenous Peoples in Canada. Studies indicate that Métis individuals face disproportionate challenges regarding oral health, including exclusion from dental care available to other Indigenous groups under the Non-Insured Health Benefits program, resulting in untreated dental issues that often require emergency care. Objectives: This study is the first to assess the prevalence of Dental Problems Not Associated with Trauma (DPNAT) visits to non-dental care settings among Métis populations. Methods" A population-based cohort study was conducted using linked administrative health data from ICES. Emergency department and primary care visits related to DPNAT in Ontario for registered Métis Nation of Ontario (MNO) citizens were extracted between 2012 and 2021. Descriptive statistics were used to analyze the trend over time. The frequency of diagnosis codes and unadjusted and adjusted rate ratios were also calculated. Results: Among 27,128 MNO citizens, there were 1,676 visits to emergency departments (ED) and 1,655 visits to primary care settings from 2012 to 2021. DPNAT visits were more common among lower-income citizens and urban citizens, with an even sex distribution. From 2012 to 2021, the adjusted rate of DPNAT visits increased from 496 to 804 per 100,000 citizens in EDs and from 353 to 583 per 100,000 citizens in primary care. Within one year, there were, on average, 179 return visits to the ED and 146 to primary care. The most common diagnoses for the ED and primary care were pulp and periapical tissue diseases (45.5%) and dental caries (36.9%), respectively. Conclusion: Dental-related visits to emergency departments and primary care settings are increasing among MNO citizens and disproportionately impacting low-income quintile citizens. These findings highlight the need for publicly funded dental care for MNO citizens. Métis-specific and Métis-led oral health interventions are warranted to decrease DPNAT visits in non-dental care settings.

Sarah Edwards

Self-Reported Health Outcomes Among Registered Métis Citizens of Ontario Living with Disabilities.

Background: Métis individuals have been found to have higher rates of disabilities compared to non-Indigenous people in Canada. Studies indicate that individuals living with disabilities face higher mortality rates and poorer health outcomes compared to those without disabilities. Although Métis individuals face disproportionate challenges related to physical, mental, and oral health, research remains limited in understanding the health and well-being of Métis people living with disabilities. Objectives: To describe the characteristics of Métis Nation of Ontario (MNO) citizens with and without disabilities and examine the association between disability status and their health outcomes. Methods: Data was analyzed from a 2024 cross-sectional population survey conducted by the MNO. Self-reported disability status and self-reported health (overall, oral, physical, mental and holistic) outcomes were assessed. Health outcomes were dichotomized as good (good/very good/excellent) vs. not good (fair/poor). Descriptive statistics were used to characterize the study sample. Modified Poisson regression models were used to estimate the association between disability status and health outcomes, adjusting for sociodemographic factors. Results: Among 3,071 respondents, 823 citizens reported having a disability. Citizens with disabilities were more likely to be women, have post-secondary education and be in lower income brackets. Citizens without disabilities had a higher prevalence of reporting good health across multiple domains compared to those living with disabilities. The prevalence ratios for these associations were 1.28 (95% CI: 1.24,1.32) for good overall health, 1.26 (95% CI: 1.22,1.30) for good physical health, 1.14 (95% CI: 1.11,1,18) for good mental health, 1.08 (95% CI: 1.04, 1.11) for good oral health and 1.06 (95% CI: 1.04,1.08) for good holistic health. Conclusion: MNO citizens with disabilities reported worse health outcomes across all domains compared to MNO citizens without disabilities. These findings highlight the need for targeted public health interventions to address these health inequities among MNO citizens with disabilities.

Sarah Edwards

Longitudinal changes in the prevalence of the Excessive Daytime Sleepiness in Two Saskatchewan First Nation Communities

Background: Excessive daytime sleepiness (EDS) is a major public health issue that can reduce individuals' work productivity and also could be an alarming sign for sleep disordered breathing such as obstructive sleep apnea (OSA). Objectives: To investigate the longitudinal changes in the prevalence of EDS assessed by Epworth Sleepiness Scale (ESS) in two First Nations communities. Methods: The First Nations Sleep Health Project (FNSHP) was conducted according to Chapter 9 of the Tri-Council Policy Statement 2, and the methodologies outlined by the First Nations Information Governance Committee in their First Nations Regional Longitudinal Health Survey. It collected information on demographics, socioeconomics, environment, and determinants of health from two First Nation communities (community A and community B). Multivariable logistic regression based on generalized estimating equations to account for within subject correlation due to repeated measurements at baseline (2019) and follow-up (2022) was employed to investigate the association between a binary EDS outcome (normal or abnormal) and a set of explanatory variables. Results: Women made up 56% of respondents with an average age of 41 years (±15), while men comprised 44% with an average age of 39 years (±14.5). The unadjusted EDS prevalence at baseline was 18.2%, rising slightly to 19.5% at follow-up. Participants also reported several health issues. At baseline, depression (31%) and anxiety (32%), were common, with 65% indicating poor sleep due to anxiety/depression. Statistical analysis revealed that heart problem (OR: 1.78, CI 1.07-2.96) was significantly associated with abnormal EDS. The risk of abnormal EDS among those who had trouble sleeping due to cough/snore was higher in ever smokers compared to never smokers. Older individuals with depression were more likely to experience abnormal EDS. Conclusion: Depression, respiratory issues (such as cough/snore during sleeping time) and heart disease were the three main determinants of the excessive daytime sleepiness.

Mohsen Ghamari, University of Saskatchewan

Exploring the patient profile of Métis Nation of Ontario citizens admitted into residential and hospital-based care in Ontario

Background: The population in Ontario is ageing, including the Métis Nation of Ontario (MNO) citizen population. However, there is very little information available to understand the profile of ageing Métis people and their usage of ageing-related services. Objectives: This study aims to determine the patient profile of MNO citizens in comparison to the non-MNO population in Ontario pre- and during COVID-19 for admission into residential care, hospital-based care, by frailty status and disability status. Methods: A cross-sectional population-based cohort study was conducted using administrative health data from ICES and linked to the MNO Registry. Patient characteristics were described for two study periods: pre-COVID-19 (July 1, 2018-Jan 24,2020) and during COVID-19 (Jan 25, 2020-Dec 31, 2021). The results include the number and percentage of individuals with various health characteristics, functional characteristics, and service use, stratified by MNO citizen status, residential care admission, hospital-based care admission, frailty, and disability status. The rates of homecare service and the prevalence of disability per type were calculated. Results: The cohort of MNO citizens pre-COVID-19 totaled 9,978 and 10,447 during COVID-19. The number of MNO citizens admitted to residential care, hospital-based care, who were frail, or living with a disability was higher during COVID-19 compared to pre-COVID-19. The prevalence of any disability among MNO citizens increased during COVID-19 and remained higher than the prevalence of any disability among non-MNO citizens in both time periods. The rate of home care service received by MNO citizens also increased during COVID-19 with several types of services having a higher intensity per 100,000 for MNO citizens. Conclusion: The results provide information on the characteristics and usage of ageing-related services among MNO citizens. These findings are important to the MNO as they can support decision making around ageing and community-based programs and advocacy efforts regarding funding and capacity building.

Haley Golding, ICES , Epidemiologist

Describing perinatal factors of Métis Nation of Ontario citizens: A retrospective population cohort study

Background: Despite perinatal factors being an important indicator of population health they are under reported among Indigenous Peoples, including Métis. Alberta-specific research and national studies on self-identified Métis suggests that Métis people have more adverse birth outcomes compared to non-Métis individuals, including higher rates of gestational diabetes, hypertension, and substance use during pregnancy and birth outcomes such as sudden infant death syndrome, and infants born large for gestational age. Objective: To describe perinatal factors for citizens of the Métis Nation of Ontario (MNO) between 2012 and 2021. Methods: This was a retrospective, population-based cohort study using administrative health data accessible through ICES under a Data Governance and Sharing agreement with the MNO. The MNO Citizenship Registry can be linked with these datasets. Descriptive statistics were compared between MNO and non-MNO citizens in Ontario for maternal characteristics, antenatal, and postnatal factors. Results: There were 1,362,434 singleton births in Ontario between 2012 and 2021. Of these, 2,751 (0.20%) were births by an MNO citizen. MNO citizens were, on average, younger at delivery than non-MNO citizens and had higher weight gain. Non-MNO citizens more often had an obstetrician present whereas more MNO citizens had a family physician present. MNO had higher rates of morbidities, hypertension, pre-existing health conditions, and substance use during pregnancy. MNO citizens were more likely to use folic acid and breastfeed exclusively. MNO citizens were also more likely to have their newborns transferred to the neonatal intensive care unit. Conclusion: This is the first population-based study to explore perinatal differences between MNO and non-MNO citizens giving birth in Ontario. The results can be used to inform programs designed to support healthy and safe pregnancies for Métis mothers. Future research should incorporate Indigenous and qualitative methods to have a more comprehensive picture of Métis birth experiences.

Hibah Sehar

Describing factors associated with polysubstance of Métis Nation of Ontario citizens: A cross-sectional study

Background: Polysubstance use is the consumption of more than one substance at once or on different occasions and is associated with harms and risky behaviours beyond those associated with individual substance use and has been increasing over the past decade in Canada. Although the prevalence of polysubstance use is thought to be higher in Indigenous populations, there have been no distinctions-based studies examining polysubstance use in Métis people. Objective: To determine the prevalence of polysubstance use in citizens of the Métis Nation of Ontario (MNO) and factors associated with polysubstance use. Methods: This was a cross-sectional study. Data was collected as part of a 2024 MNO health survey. All MNO citizens 16 years and older with a valid email on file with the MNO Registry were invited to participate. The survey collected information about the overall well-being of MNO citizens as well as commercial tobacco, alcohol, electronic cigarette, and cannabis use. Participants also reported on sociodemographics. Descriptive statistics were used to examine the level of use for each substance and polysubstance use. Chi-Square tests were used to assess associations between sociodemographic factors, health outcomes and polysubstance use. Results: In total, 3,785 MNO citizens responded to the survey. Alcohol was the most reported substance used (78.1%) by MNO citizens, followed by cannabis (31.0%), commercial tobacco use (14.8%) and e-cigarette/vaping device (6.7%). Approximately one third (34.9%) of respondents were polysubstance users. Most individuals who were polysubstance users were male and aged between 25 to 64. Fair or poor overall health and mental health was reported more often than good or excellent health for polysubstance users compared to non-polysubstance users (p-value <0.0001). Conclusion: This is the first study to examine polysubstance use in a Métis population and can be used to inform prevention policies and programs.

Hibah Sehar

Incidence des maladies infectieuses à déclaration obligatoire dans la Cohorte de naissance québécoise sur l'immunité et la santé

Contexte Notre groupe mène une vaste étude portant sur la vaccination au bacille Calmette-Guérin (BCG) et la prévention à très long terme de la tuberculose et d'autres maladies infectieuses. Objectif Déterminer le taux d'incidence de la tuberculose et de certaines infections invasives, selon le sexe, dans la Cohorte de naissance québécoise sur l'immunité et la santé (CO·MMUNITY). Méthodes La cohorte a été établie par la liaison des données sociodémographiques et médico-administratives des personnes nées au Québec entre janvier 1970 et décembre 1974. Les cas incidents ont été documentés à partir de 1990, 1991, 1996 et 1997 respectivement pour la tuberculose, les infections invasives à méningocoques, streptocoques du groupe A et pneumocoques, avec un suivi jusqu'en 2021. Les personnes-années de suivi ont été calculées pour chacune des infections. Résultats La cohorte comprenait 400010 personnes en janvier 1990, dont 51,2% d'hommes. Le taux d'incidence de la tuberculose pour 100000 personnes-années était de 0,70 (intervalle de confiance [IC]95% : 0,52-0,90) chez les hommes et 0,63 (IC95% : 0,46-0,83) chez les femmes. Concernant l'infection à méningocoques, le taux pour 100000 personnes-années était de 0,62 (IC95% : 0,43-0,81) chez les hommes et 0,59 (IC95% : 0,40-0,79) chez les femmes. Au sujet de l'infection à streptocoques du groupe A, le taux correspondant était de 4,98 (IC95% : 4,38-5,59) chez les hommes et 4,84 (IC95% : 4,24-5,45) chez les femmes. Pour l'infection à pneumocoques, le taux était de 5,58 (IC95% : 4,93-6,24) chez les hommes et 4,38 (IC95% : 3,79-4,97) chez les femmes. Conclusion Cette étude révèle des taux d'incidence conformes à ceux attendus selon l'âge. Les taux d'incidence étaient similaires en fonction du sexe sauf pour l'infection à pneumocoques. Des analyses complètes seront prochainement menées afin d'estimer l'association entre la vaccination par le BCG et la survenue de ces infections.

Rodrigue Ahodegnon

Charge virale du virus du papillome humain (VPH) durant la grossesse et association avec la transmission verticale du VPH

Contexte: Chez les enfants, l'infection par le virus du papillome humain (VPH) survient souvent en raison de transmission verticale, mais les facteurs de risque associés à cette transmission restent peu connus. Objectif: Évaluer l'association entre la charge virale du VPH durant la grossesse et le risque de transmission verticale. Méthodes : Les données proviennent d'une cohorte multicentrique de 1050 femmes enceintes recrutées entre 2010 et 2016 dans trois centres à Montréal. Des échantillons vaginaux ont été collectés lors du 1er et 3ième trimestre, des échantillons conjonctivaux, oraux, pharyngés et génitaux ont été collectés chez les enfants à la naissance et à 3 mois. Ces échantillons ont été testés pour l'ADN du VPH et la charge virale par PCR en temps réel. Des modèles de régression logistique ajustés pour l'âge de la mère ont été utilisés pour analyser l'association entre la charge virale en grossesse (femmes infectées par les 13 génotypes les plus courants) et la transmission verticale. Résultats: Une diminution des charges virales, tous génotypes de VPH confondus, a été observée durant la grossesse. Les femmes ayant plus de 2 copies de VPH/cellule (comparées à celles ayant ≤ 2 copies) au premier trimestre avaient un risque statistiquement significatif plus élevé de transmission verticale (OR ajusté=6,41; IC95%:1,10-37,34) pour tous les génotypes et OR=17,17; IC95%:1,18-250,28 pour le VPH-16). Les valeurs de la charge virale analysées en continu ou catégorisées avec différents seuils ont montré des résultats comparables. Conclusion: La transmission verticale du VPH a été fortement associée à la charge virale du VPH durant la grossesse. Les résultats permettent de mieux comprendre les facteurs de risque associés à la détection du VPH chez l'enfant.

Alice Bénard

Population Attributable Mortality Associated with Respiratory Viruses in Ontario

Background: Respiratory illnesses pose a significant health burden and can cause substantial mortality. Many respiratory viruses are vaccine-preventable or have effects that can be attenuated through vaccination. Prioritizing vaccination programs depends on understanding their potential to prevent morbidity and mortality. While cause-specific death data exist, coding limitations in assigning accurate causes are well known. Regression-based approaches offer an indirect method to estimate population-attributable fractions (PAF). Objective: We aimed to calculate the PAF for influenza A and B, and respiratory syncytial virus (RSV) from 1993 to 2024, and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from 2020 to 2024 in Ontario, Canada. Methods: Laboratory surveillance data for influenza A, B, and RSV were available from 1993 via FluWatch. SARS-CoV-2 percent positivity was available from September 2022 to August 2024, and test-adjusted case data from March 2020 to September 2022. Death data were obtained from Ontario Vital Statistics (1994-April 2024) and StatCan (1993). Negative binomial models accounted for baseline trends and seasonality. Virological coefficients were added, and PAFs with 95% confidence intervals (CIs) were estimated by setting virus model coefficients to zero. Results: Before 2020, influenza A had the highest predicted deaths (39,565, PAF=0.018 [95% CI: 0.014-0.022]). After 2019, SARS-CoV-2 surpassed influenza A in predicted deaths (18,051, PAF=0.035 [95% CI: 0.023-0.048] while influenza A declined during the pandemic (4,257, PAF=0.008 [95% CI: 0.006-0.010]). PAFs for influenza B and RSV were low and declined with SARS-CoV-2's emergence. Predicted SARS-CoV-2 deaths aligned with reported COVID-19 deaths in Ontario (18,602). Conclusion: SARS-CoV-2 has surpassed influenza A as the leading cause of attributable respiratory mortality in Ontario. Model-based estimates closely matched reported COVID-19 deaths, suggesting high completeness of reporting. These findings highlight the importance of vaccination programs against SARS-CoV-2 and influenza A to prevent substantial excess mortality.

Alicia Grima, Dalla Lana School of Public Health, University of Toronto, PhD Candidate | Teaching Assistant

Impact of HPV vaccination on the incidence and clearance of HPV infections: a propensity score-weighted cohort analysis

Background: HPV vaccination has proven effective in protecting against HPV infections in real-world settings; however, it does not impact clearance of existing infections. Objective: We assessed the association between HPV vaccination and incidence and clearance of HPV infections in young, sexually active women in Montreal, Canada, enrolled (2013-2020) in the Carrageenan-gel Against Transmission of Cervical Human papillomavirus randomized control trial. Methods: Participants provided self-collected vaginal samples and completed an electronic questionnaire at each of the 7 visits conducted over 12 months. HPV vaccination status was self-reported at screening, enrollment questionnaire, and/or email communications sent to participants to validate reporting. Participants were classified as vaccinated/unvaccinated if they reported so in ≥2 sources. HPV genotyping was performed on samples using the Linear Array assay. We collapsed study arms and analyzed the data within a cohort framework. Study intervention and HPV risk factors were included as covariates in generating inverse probability of treatment weights, applied to adjust for baseline confounders due to imbalances between vaccinated and unvaccinated participants. We used Cox regression to estimate hazard ratios (HR) and 95% confidence intervals (CI) at the HPV-level (unit of analysis=HPV infection), with vaccination treated as time-varying in incidence analyses. We considered vaccine-targeted HPVs 6/11/16/18 as the outcome of interest and non-vaccine-targeted types to assess construct validity (within-species: HPVs 31/33/35/39/44/45/52/58/59/67/68/70; cross-species: HPVs 26/34/40/42/51/53/54/56/61/62/66/69/71/72/73/81/82/83/84/89). Results: Among 461 participants (median age: 22.3 years), 45.8% were vaccinated at baseline. Incidence of HPVs 6/11/16/18 was significantly lower in vaccinated (20/902 infection events) compared to unvaccinated (52/766 infection events) participants (HR=0.41, CI=0.23-0.72). As expected, incidence of within-species (HR=1.21, CI=0.90-1.64) and cross-species (HR=1.21, CI=0.94-1.55) HPVs did not differ by vaccination status. Clearance of baseline vaccine-targeted and non-vaccine-targeted HPV infections was also comparable by vaccination status. Conclusion: Our findings provide additional support that HPV vaccination is prophylactic, with no evidence of therapeutic capabilities.

Pareesa Kassam, McGill University, Division of Cancer Epidemiology

HIV testing trends and their consequences on metrics of HIV testing efficiency in Africa

Background: HIV testing services are the entry point to HIV diagnosis and treatment. In Africa, where 2/3 people living with HIV reside, annual numbers tested for HIV have declined since peaking in 2017. This study aims to assess the impact of these reductions on diagnosis coverage and time-to-diagnosis by gender in African countries. Methods: We collated information on total and antenatal care (ANC) HIV testing volumes in all African countries with available data, as reported in their UNAIDS Spectrum files. To capture gender differences, we modified a previously validated mathematical model of HIV testing rates (Shiny90) and calibrated it to ANC testing. For each country, we constructed a counterfactual scenario in which peak pre-decline rates of HIV testing are maintained and compared across knowledge of HIV status and time-to-diagnosis by gender. Results: Program data from 37 countries showed that HIV testing declined in 65% of countries over 2016-2023, mostly attributed to reduced HIV testing outside of ANC. Among countries with a decline, HIV testing volumes decreased by a median of 28% (interquartile range [IQR]:24%-52%). Although awareness of status increased in most countries between 2017 and 2023, it would have further increased by 1.2%-points (Credible Interval [CrI]:1.0%-1.6%) to 87% (CrI:86%-87%) in men and 1.0%-points (CrI:0.8%-1.1%) to 91% (CrI:91%-91%) in women had there been no decline in HIV testing. In countries with an HIV testing decline, time-to-diagnosis increased by an additional 0.5 years (CrI:0.4-0.6) to 2.7 years (CrI:2.6-2.9) among women and 0.7 years (CrI:0.6-0.8) to 3.3 years (CrI:3.1-3.5) among men in 2023, if there had been no decline in HIV testing. Conclusion: Recent declines in HIV testing did not affect testing at ANC. These reductions in testing volumes have worsened HIV testing outcomes, especially for men. Longer time-to-diagnosis may lead to increased time spent infectious and a slower decline of incidence.

Andrey Kutsyh

Association between bacterial vaginosis and HPV prevalence in young women

Bacterial vaginosis (BV), a colonization of the female genital tract by non-Lactobacillus dominant microbiota, has been linked to an increased risk of human papillomavirus (HPV) prevalence and acquisition. In this study, we assessed the association between BV and HPV prevalence in HPV-unvaccinated female participants of the HITCH (HPV Infection and Transmission among Couples through Heterosexual Activity) cohort study. HITCH enrolled 18-24-year-old female university students in Montréal, Canada (2005-2011), with a two-year follow-up. At each study visit, vaginal swabs were collected and genotyped for 36 HPV types using quantitative polymerase chain reaction, while microbiome was characterized through sequencing the V5-V6 regions of 16s rRNA. For this analysis, we considered only baseline data. We used Logistic regression analysis to estimate odds ratios (OR) and 95% confidence intervals (CI) for the association between microbiome composition and HPV prevalence, adjusting for demographic and sexual behavior variables. Microbiome diversity was measured using alpha diversity (Shannon index, which captures both species richness and evenness) and beta diversity (community composition differences) Among 378 participants, 218 (57.7%) tested positive for any HPV, 159 (42.1%) for high-risk HPV (hrHPV), 72 (19.0%) for HPV16, and 82 (21.7%) for HPV16/18. Of the participants, 144 (38.1%) had Lactobacillus dominant microbiome, while 234 (61.9%) had BV. The median alpha diversity value was 2.29(IQR:2.71,3.05). No significant associations were observed between alpha diversity and HPV types (adjusted OR: 1.16, CI: 0.52–2.56 (adjusted OR: 1.09, CI: 0.84–1.42). Some trends were observed, including higher odds of HPV16/18 detection in participants with BV (adjusted OR: 2.19, CI: 1.03–4.70), though results were not consistent across other HPV subtypes. Our findings do not suggest an association between BV and HPV prevalence. This highlights the need for longitudinal studies to determine whether microbiome stability influences HPV acquisition or clearance, which we are investigating in ongoing analyses

Ruth Mwatelah

A retrospective analysis of COVID-19 cluster emergence in Québec from 2020 to 2022

Background & objectives: Throughout the COVID-19 pandemic, cases distribution often displayed patterns of spatial concentration. Areas with greater socioeconomic vulnerability and higher proportion of ethnic minorities were frequently associated with the emergence and the persistence of clusters. Yet, few studies have examined the sociodemographic characteristics of individuals most likely to be among the first cases in large community clusters. The objective of this study was to identify the characteristics associated with initial COVID-19 cluster cases in Québec from 2020 to 2022. Methods: Using Québec provincial COVID-19 case database, we applied scan statistics to identify large community clusters (>100 cases) across the different pandemic waves during the study period. We then used modified Poisson models to estimate the relative risk of various subgroups and sociodemographic characteristics being among the initial cases within these clusters. Characteristics included age, biological sex, healthcare worker status, vaccination status, presence of chronic health conditions, levels of social and material deprivation. Results: Numerous clusters were identified across Québec throughout the pandemic, with variation in number, geographic distribution, and size across the seven waves of COVID-19. Adolescents, young adults, and adults (12-17 years old, 18-29 years old and 30-49 years old, respectively) were more likely to be among the early cases within clusters, particularly during the first four waves of the pandemic. Conclusion: Our results suggest that monitoring COVID-19 trends among the younger populations may provide early indications of large-scale community transmission, which could then inform tailored preventive interventions targeting these age groups.

Adrien Saucier, Université de Montréal, Research counselor

Does outdoor physical activity buffer the negative association between screen time and positive mental health in adults?

Background: Screen time is omnipresent but can negatively impact mental health. In contrast, physical activity (PA) has numerous mental health benefits, especially when practiced outdoors. Could outdoor PA buffer the negative association between screen time (ST) and mental health? This study estimates the associations between each of occupational and recreational ST and positive mental health (PMH) in young adults and investigates effect modification by outdoor PA. Methods: Data were drawn from the Nicotine Dependence in Teens study (n = 623, 59.1% female; mean (SD) age = 35.2 (0.6) years). Hours of occupational and recreational ST per day were measured in 2022-23. Six months later, participants reported their PMH (measured using the Mental Health Continuum-Short Form) and monthly frequency of outdoor PA participation (measured using a 6-point Likert scale). Multivariable linear regressions were fit separately for each of (i) occupational and (ii) recreational ST hours/day and PMH, adjusting for sex, age, education level, and PA volume (measured using the International Physical Activity Questionnaire-Short Form). The buffering effect of outdoor PA on the association between ST and PMH was investigated with stratified analyses (frequent vs infrequent outdoor PA). Results: Occupational ST ($\hat{\beta}$[95%CI] = -0.3[-0.6, -0.03]) and recreational ST (-1.1[-1.6, -0.7]) were negatively associated with PMH. In stratified analyses, occupational ST was negatively associated with PMH among participants who reported infrequent outdoor PA (-0.6 [-1.2; -0.1]). However, we did not detect any association between occupational ST and PMH among participants who reported frequent outdoor PA (-0.1 [-0.5; 0.2]). Neither frequent nor infrequent outdoor PA modified the negative association between recreational ST and PMH. Conclusion: Recreational and occupational ST are inversely associated with PMH in young adults. Outdoor PA might buffer the negative association between occupational ST and PMH, providing a promising avenue for intervention. However, studies with larger samples are needed.

Dorothee Comtois-Cabana, LABE - Laboratoire Activité physique et Bien-Être, PhD student

Validity of the Strengths and Difficulties Questionnaire Among Children with a Physical Illness

Background: Children with physical illnesses have an increased risk of developing a co-occurring mental illness (i.e., physical-mental multimorbidity). Thus, brief self-report measures that assess psychopathology in clinical settings are critical. The Strengths and Difficulties Questionnaire (SDQ) is a 25-item measure with five subscales—prosocial behaviour, conduct problems, emotional symptoms, hyperactivity, and peer problems. Items are summed to calculate the subscale scores and a total difficulty score (excluding prosocial behaviour). Objectives: This study aimed to validate the five-factor structure of the SDQ as well as a higher-order structure that includes total difficulty, and assess known-group validity by comparing SDQ scores between children with versus without physical-mental multimorbidity. Methods: Data come from a study of 263 children with a chronic physical illness aged 2-16 years recruited from outpatient clinics at a pediatric hospital. The SDQ measured symptoms of child psychopathology and the Mini International Neuropsychiatric Interview measured presence of physical-mental multimorbidity in children; both were parent-reported. Factor models of the SDQ were estimated using confirmatory factor analysis. Model fit was evaluated using standard thresholds for CFI, RMSEA, and SRMR, whereby fit was deemed adequate if ≥2 indices met thresholds. Linear regression, adjusting for child age and sex, was used to evaluate known-group validity. Results: The five-factor structure of the SDQ had acceptable model fit (CFI=0.91, RMSEA [90% CI]=0.07 [0.06, 0.08], SRMR=0.12), as did the higher-order factor structure (CFI=0.93, RMSEA=0.07 [0.06, 0.08], SRMR=0.10). Adjusting for age and sex, children with physical-mental multimorbidity had significantly higher subscale (prosocial behaviour not tested) and total difficulty scores than those without multimorbidity ($p<0.05$ for all). Conclusion: These findings validate the factor structures of the SDQ and its ability to differentiate between children with versus without physical-mental multimorbidity. This evidence supports the use of the SDQ in clinical settings to screen for psychopathology in children with physical illness.

Gurkiran Dhuga, University of Waterloo, PhD Candidate

Trajectories of Psychological Distress and Social Impairment Among Children and Adolescents Living in Montreal During and After the COVID-19 Pandemic.

Background The COVID-19 pandemic disrupted young people's lives, but its effects on their mental health have been variable. However, most research to date has not considered the diverse psychological trajectories of youth nor examined how these trajectories evolve over time in longitudinal studies. Objectives This study aims to model the trajectories of psychological distress among distinct latent classes of youth throughout and following the pandemic. It also sought to identify predictors associated with the different distress classes. Methodology The EnCORE study followed children and adolescents aged 2 to 18 years across five waves of data collection (October 2020–May 2023). Mental health was assessed at each time point using the impact supplement of the Strengths and Difficulties Questionnaire. Additional data were collected on sociodemographic characteristics and changes in lifestyle habits. Growth mixture models were used to identify distinct classes of distress trajectories and multinomial logistic regressions were conducted to identify predictors associated with each trajectory class. Results Among the study participants (n=884), three distinct psychological distress classes were identified: No Distress (81%), Mild Distress (11%), and Important Distress (8%). Older adolescents were more likely to belong to the distress classes (OR [95%CI] Mild: 1.10 [1.04-1.15]; Important: 1.15 [1.08-1.22]), while youth with more highly educated parents were less likely (OR [95%CI] With a Bachelor's degree for Mild: 0.56 [0.33-0.95]; Important: 0.34 [0.18-0.62]) (With a Master's degree or higher for Mild: 0.43 [0.25-0.76]; Important: 0.37 [0.20-0.68]). Several lifestyle factors, such as eating habits, in-person social interactions, sleep duration, physical activity, and social media use, were identified as significant predictors of membership in the Mild and Important Distress classes compared to No Distress class. Conclusion Youth followed distinct trajectories of psychological distress throughout and after the COVID-19 pandemic. Understanding factors associated with these trajectories can inform more effective and targeted mental health prevention strategies.

Florence Dupont, Université de Montréal, M.Sc. Candidate

The Association between Pre-existing Mental Health and Developmental Conditions and Post-concussion Functional Impairment and Disability

Background: Patients with concussions often present with pre-existing mental health conditions (MHC) and developmental conditions. Research gaps exist in understanding how previous MHC and developmental conditions are linked to the recovery of patients with concussion. Objectives: To explore the relationship between a previous MHC or developmental condition diagnosis with the burden of symptoms, disability and lost working days of concussion patients in Ontario, Canada. Methods: The study is based on patient-reported data from a multicenter cross-sectional survey. The independent variable is the self-reported diagnosis of previous MHC and developmental conditions. The outcome variables are the Rivermead Post-Concussion Symptoms Questionnaire (RPQ) score, and the Sheehan Disability Scale (SDS) measured during patients' any concussion clinic visit. Multivariate regression analysis showed the relationship between previous MHC/developmental conditions and RPQ total score, SDS total and domain-specific scores, and number of lost/underproductive working days. Results: Among participants, 21.3% had a pre-existing MHC, 3.9% had developmental conditions, and 7.3% had both. The mean RPQ score for patients without any MHC or developmental condition was 27.48±15.52 compared to 36.68 ±13.64 among those having both conditions ($p<0.001$). Similarly, SDS total and domain-specific scores were higher for patients with MHC and developmental conditions compared to those without any conditions (21.22±6.72 vs. 18.20±8.61, $p<0.001$). In multivariate regression analyses, the total mean RPQ score is 7.44 (95% CI 4.14-10.74, $p=0.00$) and the total mean SDS score is 2.75 (95% CI 0.55-4.96, $p=0.015$) higher for people with both MHC and developmental conditions compared to those without any conditions. However, MHC and developmental conditions were not significantly associated with the number of underproductive workdays or workdays lost due to concussion-related disability in adjusted models. Conclusion: The study highlights the importance of addressing pre-existing MHC and developmental conditions in concussion patients for providing patient-centred care to groups at risk of long-term symptoms and disability.

Umme Saika Kabir, Lakehead University, Graduate Research Assistant

The Association between Pre-existing Mental Health and Developmental Conditions and Post-concussion Health Care Utilization

Background: Concussion patients often present with pre-existing developmental and mental health conditions (MHC) linked to their delayed symptom recovery. The patients having persistent symptoms require much higher health care utilization (HCU) and expenditure. Objective: To explore whether there is any association between pre-existing MHC and developmental conditions with the HCU of concussion patients in Ontario, Canada. Methods: The study deployed patient-reported data from an extensive multicenter cross-sectional survey. The independent variable is pre-existing MHC and developmental conditions in concussion patients. The patients were divided into four groups according to the exposure status, namely, no MHC/developmental conditions, developmental conditions only, mental conditions only, and both MHC/developmental conditions. The primary outcome variables are emergency department (ED) and family doctor (FD) visits (yes/no) in the post-concussion period. We also compared the mean number of ED and FD visits among the concussion patients with or without previous MHC/developmental disorders. Results: A total of 1432 patients participated in the study. Approximately 21.3% had a previous diagnosis of MHC, 3.9% had developmental conditions and 7.3% had both. Among the patients without any pre-existing conditions, 28.6% visited ED compared to 49.5% of the patients with both conditions ($p<0.001$). Similarly, attending FD was also higher among the patients with both previous MHC/developmental conditions in comparison to those without the conditions (45.1% vs. 28.8%, $p<0.001$). However, the mean number of ED and FD visits did not differ significantly based on the presence or absence of previous MHC/developmental conditions. Multivariate regression analysis showed no difference in the likelihood of visiting ED (OR 1.66, 95% CI 0.97-2.79) and FD (OR 1.08, 95% CI 0.66-1.80) for concussion patients with or without pre-existing MHC and developmental conditions. Conclusion: Concussion patients with long standing conditions are more likely to seek health care. However, their overall HCU is not higher than those without the conditions.

Umme Saika Kabir, Lakehead University, Graduate Research Assistant

Exploring the mediating role of coping strategies in the relationship between sleep quality and positive mental health among young adults

Background: Good sleep quality is associated with stress reduction and improved positive mental health (PMH), among other benefits. Sleep quality is also thought to be associated with the use of coping strategies (problem-solving, emotions and avoidance), which in turn are associated with mental health. However, the possible mediating role of coping strategies in the relationship between sleep quality and PMH remains under-investigated. Our study aims to explore this association in young adults. Methods: The analytical sample (n~563; mean age~30.4 years; 60.2% female) was drawn from the longitudinal study Nicotine Dependence in Teens (1999-ongoing). Sleep quality was measured with one item (low vs. high), coping strategies with the Coping Inventory for Stressful Situation, and PMH with the Mental Health Continuum-Short Form. Potential confounders included age, gender, education level, and marital status. To ensure temporality and assess potential causal relationships, confounders, exposure, mediators, and outcome were measured sequentially. Linear regressions were performed, and mediation analyses based on counterfactual definitions of natural direct and indirect effects are ongoing. Results: Better sleep quality was associated with a higher PMH (β̂ adjusted [95% CI] = 5.6 [3.8,7.4]), greater use of problem-solving-focused strategies (1.4[0.6,2.2]) and less use of emotion-focused strategies (β̂ adjusted [95% CI] = -2.0 [-2.9, -1.2]). Problem-solving strategies were positively associated with PMH (β̂ adjusted [95% CI] = 0.8 [0.6, 1.0]) and emotion-focused strategies were negatively associated (β̂ adjusted [95% CI] = -0.9 [-1.0, -0.7]). Avoidance was not associated with sleep quality or PMH. Conclusion: These findings suggest that improving sleep quality may enhance mental health and highlight the distinct relationships between sleep quality, coping strategies, and positive mental health. Mediation analyses will estimate the proportion of the association between sleep and positive mental health mediated by each coping strategy. Final results may provide insights for future interventions.

Darline Larissa Kengne Kuate, CRCHUM - Centre de recherche du centre hospitalier de l'Université de Montréal, Recherch Assistant

Indicators of Socioeconomic Disadvantage and Psychopathology in Children with Chronic Physical Illness

Background: Children with a chronic physical illness (CPI) have an increased risk of developing psychopathology. The combination of chronic stress and socioeconomic disadvantage often contributes to poor mental health in this vulnerable population of children. Research Questions: This study addresses the following questions: (1) Are indicators of socioeconomic disadvantage higher among families of children with CPI compared to the general population? (2) Are these socioeconomic indicators associated with psychopathology among children with CPI over a 48-month period? (3) Does child stress moderate associations between socioeconomic indicators and child psychopathology over time? Methods: Data come from the Multimorbidity in Children and Youth across the Life-course (MY LIFE) study, which followed 263 children aged 2-16 years diagnosed with a CPI over 48 months. A one-sample t-test compared mean differences in socioeconomic indices, measured by the Ontario Marginalization Index (ON-MARG), between MYLIFE and the general population. Linear mixed models (LMMs) examined associations between ON-MARG dimensions and psychopathology symptoms, as measured with the Emotional Behavioural Scales. Moderation by child HCC was investigated using a time-varying product-term interaction. Results: At baseline, the study included 263 children with a CPI (mean age: 9.4 years, 53% male). Analyses revealed that children in the MYLIFE sample resided in areas characterized by greater socioeconomic disadvantage relative to the general population (M=0, SD= 1). Material resources (β =0.13, p= 0.03) and the interaction between households and dwellings and time (β =0.02, p= 0.04) showed a significant association to parent-reported externalizing symptoms. Households and dwellings were significantly associated to child-reported externalizing symptoms (β =0.02, p= 0.04), as well as the interaction between age and labour force, time, and child stress (β =0.09, p= 0.02). No significant associations were noted between ON-MARG dimensions and parent- and child-reported internalizing symptoms. Conclusion: Children with CPI were more likely to live in areas of high socioeconomic disadvantage with housing and material deprivation predicting elevated psychopathology symptoms. LMMs showed that time-varying child stress moderated these associations, and informant differences reinforced the value of multi-perspective reporting. Findings highlight the need for integrated, equity-informed interventions targeting both structural and physiological drivers of child psychopathology.

Jothi Khaira

Patterns and trajectories of physical comorbidity in older patients with schizophrenia: A population-based cohort study

Background: People with schizophrenia often have multiple physical health conditions, and the coexistence of physical and mental health conditions complicates the clinical management of schizophrenia. Objectives: We aimed to identify age-specific patterns of physical comorbidity and trace their trajectories in patients with schizophrenia. Methods: We employed electronic medical records from all public hospitals in Hong Kong. Individuals aged 18+ with a first diagnosis of schizophrenia between 2000 and 2009 were identified. Each schizophrenia patient was matched with 4 individuals without severe mental illness. All individuals were followed up until 2019. Latent class analysis was conducted to identify meaningful patterns of physical comorbidity in schizophrenia patients diagnosed at 45 years and older, at the onset of diagnosis and at 5- and 10-year post-diagnosis. These patterns were compared to those diagnosed before 45, and those without severe mental illness. Results: A total of 32,209 individuals with schizophrenia and 134,597 individuals without schizophrenia were included. 14,890 patients (46.2% of all schizophrenia patients) were diagnosed at 45 years or older. Among patients diagnosed after the age of 45, the proportion of those with two or more physical conditions increased substantially over time: from 17.4% at the time of diagnosis to 28.6% at 5 years and 39.5% at 10 years post-diagnosis. Preliminary latent class analyses identified 3 distinct patterns at the onset of diagnosis, which evolved into 4 patterns at 5 years and 5 patterns at 10 years post-diagnosis. The combinations of physical conditions differed by the age of onset, and were significantly associated with mortality risk. Conclusions: Patterns and trajectories of somatic comorbidity differed in people with and without schizophrenia, and in schizophrenia patients diagnosed at different ages. Our findings may help identifying subgroups of individuals with similar clinical trajectories who may benefit from more personalised interventions.

Hao Luo, University of Waterloo, Assistant Professor

The role of functional social support in the association between memory and depressive symptoms: A multilevel mediation analysis of the Canadian Longitudinal Study on Aging

Background: Memory impairment and depressive symptoms contribute to serious morbidity and mortality in aging populations. One's perceived level of functional social support (FSS) may mediate depressive symptoms in memory-impaired persons. Objectives: This research utilized an analytical sample of 5958 complete cases from individuals aged 45 to 85 years with three timepoints of data (baseline, three-year, and six-year follow-ups) in the Tracking Cohort of the Canadian Longitudinal Study on Aging(CLSA) to examine: (1)the longitudinal association between memory and depressive symptoms while controlling for health, lifestyle, and sociodemographic covariates; (2)whether this association is mediated by FSS; and (3)if FSS mediation is moderated by sex and age group. Methods: Memory scores were computed using z-transformed raw scores from the modified Rey Auditory Verbal Learning Test. Depressive symptoms were measured using continuous scores from the Center for Epidemiological Studies Short Depression Scale. FSS scores were obtained using the 19-item Medical Outcomes Study – Social Support Survey. The lme4 and mediation packages in R version 4.4.2 were used for multilevel modelling and mediation analyses, respectively. Each path of the mediation model was stratified by sex and age group to investigate moderated mediation. Results: Memory function was inversely associated with depressive symptoms (regression coefficient [b]: -0.08 [95% confidence interval [CI]: -0.12, -0.05]). The indirect (mediated) effect of memory on depressive symptoms through FSS was minimal (b: -0.02 [95% CI: -0.02, -0.01]) and most of the effect was direct (b: -0.07 [95% CI: -0.10, -0.04]). We did not find evidence for FSS mediation being moderated by sex or age group. Conclusion: Higher memory function protects against the onset and possibly exacerbation of depression symptoms with FSS playing minimal mediating role in this association. Future research using additional CLSA follow-up data can focus on eliciting additional pathways underlying the association between memory and depressive symptoms in this population.

Ifunanya Modebelu, University of Waterloo

The Trajectory of Life Satisfaction Before, During and After the Outbreak of the COVID-19 Pandemic…

Background: Data on the long-term impact of the COVID-19 pandemic on Canadians' life satisfaction (LS) as late as 2024 is limited. Objectives: The study aimed to investigate the trajectories of individuals' LS before and after the outbreak, using data from a population-based community cohort. We aimed to explore the role of sociodemographic factors and psychological distress in changes in LS before and after the outbreak and assessed the impact of COVID-19-related stressors on LS measured in 2024. Methods: Data analyzed were a Montreal-based longitudinal study established in 2007. Two different logistic regression analyses were conducted. The first model examined the longitudinal trajectories of LS across 12 years: 2012–2013 (T3), 2014–2015 (T4), 2022–2023 (T7), and 2024 (T8). T3 pre-pandemic levels were the baseline for our longitudinal analysis. The second analysis focused on the impact of COVID-19-related stressors on LS in 2024 (T8), incorporating data during the pandemic period. Results: Participants at T7 with an adjusted odds ratio (AOR) of 0.71 (95% CI: 0.55–0.91) and T8 (AOR: 0.66, 95% CI: 0.51–0.85) were less likely to report high LS compared to T3. Single participants, middle-aged adults and those with high psychological distress were less likely to report high LS compared to those who were married/common-law, younger-aged participants, and those with low psychological distress, respectively. COVID-19-related stressors like changes in income over the last 12 months at T8 were associated with lower odds of high LS. Participants with high psychological distress and facing financing hardship at T7 were also less likely to have high LS. Conclusion: The impact of COVID-19 on LS in 2024 underscores the need for financial interventions, particularly for individuals facing income instability and psychological distress. Programs like the Canada Emergency Response Benefit (CERB) served as a critical buffer and may have delayed the negative impacts.

Saleh Molla

Changes in Positive Mental Health Before and After the COVID-19 Pandemic and Its Associated Sociodemographic Characteristics and COVID-19-Related Stressors

We aimed to examine the dynamic changes in positive mental health (PMH) over a period of 12 years between 2012 and 2024 and explore the relationships between changes in PMH and sociodemographic characteristics and COVID-19-related stressors. 894 participants from an established longitudinal cohort with complete PMH before and after the outbreak of the pandemic were analyzed. Generalized linear mixed models and multivariate logistic regression were used to investigate the associations of changes in PMH with sociodemographic characteristics and COVID-19-related stressors. Overall, there was an increase in languishing PMH since the outbreak of the pandemic, followed by a slow recovery. Factors including age, marital status, education, and occupation and their interplay acted as important determinants for changes in PMH over time. Furthermore, COVID-related stressors on employment were also associated with flourishing PMH during the pandemic. These research findings underscore the profound impact of the pandemic on changes in PMH and certain population groups had been disproportionally affected by the pandemic. This study highlights the need for comprehensive community mental health strategies that integrate individual, social, and contextual factors to cope with public emergencies like the COVID-19 pandemic.

Sajedeh Nejatian

See Us, Hear Us! A Mixed Methods Study on Mental Health, Coping, and Physical Activity Among Children and Youth During the COVID-19 Pandemic in Saskatchewan

Background: The COVID-19 pandemic impacted youth mental health, highlighting the need for comprehensive research approaches to examine coping strategies. Objectives: This study aimed to investigate the mental health of youth in Saskatchewan, emphasizing coping and help-seeking behaviors, particularly the role of physical activity (PA). An explanatory sequential mixed methods design was used to contextualize quantitative findings with qualitative interviews. Methods: From 510 child-parent dyads (8-18 years) originally recruited, 89 youth (16-18 years) were analyzed in depth. Data collection included an online survey and phenomenological interviews with 14 purposefully selected participants (seven youth, seven parents) conducted. Logistic regression (weighted) determined factors influencing emotional dysregulation (ED) (CEER-9), while thematic analysis elucidated lived experiences and coping processes. Results: About 30% of youth reported ED—difficulties managing emotions. Girls experienced ED. Interviews revealed that disruptions to PA and social connections impaired coping mechanisms. Youth from households earning <$100,000 experienced ED and reported difficulties accessing affordable mental health services. Rural youth and those in large cities (Regina/Saskatoon) were less likely to experience ED. Rural youth benefited from PA (e.g., farm work, access to natural spaces), while urban youth used diverse coping strategies and support systems, though increased screen time sometimes contributed to passive coping. Interestingly, youth who reported sleeping <8 hours/night were less likely to experience ED, suggesting alternative coping mechanisms compensating for reduced sleep. Similarly, those engaging in less than 7 days/week of MVPA were less likely to report ED. Qualitative findings emphasized that meaningful PA mattered, beyond frequency or intensity—providing outlet for stress, enhanced mental clarity, maintained routines, strengthened social connections and resilience. Conclusion: The integration of quantitative and qualitative methods provided a deeper understanding of youth mental health and coping. The mixed methods approach explained disparities and unexpected findings, demonstrating its value in health research to capture both patterns and lived experiences.

Vaidehi Pisolkar

How Do Meaning in Life and Personality Traits Impact Suicide Ideation in Middle-Aged and Older Adults?

Background: Suicide is a global health issue that disproportionately impacts middle-aged and older adults, necessitating research on psychological processes by which dispositional factors may impact suicide risk. Objectives: The objective of this study is to focus on protective factors, including certain personality traits, and Meaning in Life (MIL) and how they might enhance psychological resilience and mitigate or eliminate risk of future suicide ideation in middle-aged and older adults. Methods: This study's analyses use secondary data from a 2-year longitudinal study investigating risk and resiliency to suicide ideation (SI) in 173 community-residing older adults. Participants completed a demographics form, measures of Meaning in Life (MIL) and the Five Factor Model of personality 6-12 months post-baseline and of SI 12-18 months post-baseline. Multiple regression analyses tested direct and mediated effects models, controlling for age, sex, and cognitive functioning. Results: Attitudinal MIL was correlated positively with Extraversion ($r=.54$, $p<0.001$), negatively with Neuroticism, ($r=-.32$, $p<0.001$), and negatively with future SI ($r=-.50$, $p<0.001$). Attitudinal MIL partially mediated associations between Extraversion and future SI (Sobel's $Z=-3.24$, $p<0.001$), and between Neuroticism and future SI (Sobel's $Z=3.06$, $p=0.002$). Conclusion: Study findings suggest that adopting a meaningful attitude towards life's circumstances may mitigate the impact of specific personality traits on the onset or exacerbation of SI in older adults. It also suggests a role for psychological interventions that target appraisals of MIL to reduce suicide risk in older adults.

Paige Vowels, Western University, Graduate Research Assistant

Individual Participant Data Meta-Analysis of the Minimal Detectable Change of the Patient Health Questionnaire-2 (PHQ-2), Questionnaire-8 (PHQ-8), and Questionnaire-9 (PHQ-9)

Background: The minimal detectable change (MDC) is the smallest score change that can be detected beyond measurement error. Minimal important differences (MID) smaller than MDCs are not likely to be useful, as they cannot distinguish meaningful change from chance fluctuations. It is crucial to incorporate both MIDs and MDCs into the interpretation of change scores. Objectives: To use individual participant data meta-analysis (IPDMA) to estimate the MDC of the Patient Health Questionnaire-9 (PHQ-9), PHQ-8, and PHQ-2 and to examine whether MDC varies by participant characteristics and study-level variables. Methods: We used IPDMA data originally collected to evaluate the depression screening accuracy of the PHQ. Studies published in any language were eligible if they included PHQ-9, PHQ-8, or PHQ-2 item scores. MDC of the PHQ was estimated via random-effects meta-analysis using 2.77 (MDC95), 2.32 (MDC90), and 1.41 (MDC67) standard errors of measurement. Subgroup analyses examined whether MDC varied by participant age, sex, and recruitment setting. Meta-regression assessed study-level factors: mean age, proportion male, proportion with major depression, and recruitment setting. Results: 44,085 participants (mean age 49 years, 41% male, 10% with major depression) from 98 studies were included. The MDC95 was 5.72 (95% confidence interval [CI]: 5.54 - 5.90), 5.51 (5.33 - 5.68), and 2.26 (2.15 - 2.37) points for the PHQ-9, PHQ-8, and PHQ-2, respectively. MDC subgroup patterns were consistent across the three scales. The PHQ-9 MDC95 was highest in the inpatient setting at 6.48 (6.05 - 6.92) points. In meta-regression, it increased by 0.29 (0.15 - 0.43) points per 10% increase in proportion of participants with major depression. Sex and age had minimal or no association with MDC. Conclusion: The estimated MDC95 for PHQ can be used to evaluate individual changes in depression symptoms and as a threshold for assessing minimal clinical important difference estimates.

Yutong Wang, McGill University

Test-retest Reliability of Standardized Diagnostic Interviews for Adult Psychiatric Disorders: A Systematic Review & Meta-analysis

Background: Standardized diagnostic interviews (SDIs) are considered the gold standard for psychiatric disorder classification, but concerns exist about the validity and reliability of interview classifications. Given their extensive use in psychiatric epidemiology, summary information about the test-retest reliability and factors influencing reliability estimates of SDI disorder classifications is needed. Objective: To conduct a systematic review and meta-analysis of the test-retest reliability of SDIs for adult psychiatric disorders. Methods: A systematic search was conducted in PsycINFO, Embase, Emcare, MEDLINE and ASSIA databases (Prospero: CRD42024517970). After screening and data extraction, a multilevel random effects meta-analysis estimated the pooled test-retest reliability measured by Cohen's kappa. Subgroup analyses provided disorder-specific estimates. Univariate multilevel meta-regressions determined sources of between-study heterogeneity. Results: Of 6,819 screened records, 44 articles published between 1983 to 2022 from 23 countries were included. Pooled test-retest reliability was good (ϰ=0.69; 95%CI, 0.66-0.72) with substantial between-study heterogeneity (Q = 23,578, p<0.001; I2 = 93%). Subgroup analyses showed higher reliability for substance use disorders (SUDs; ϰ = 0.72, 95% CI: 0.69–0.76) than for psychiatric disorders (ϰ = 0.65, 95% CI: 0.60–0.69), confirmed by meta-regression (z = 3.75, p < .001), along with substantial variation in test-retest reliability among types of disorder. Among psychiatric disorders, reliability ranged from 0.55 for psychotic disorders to 0.74 for bipolar. For SUDs, meta-regression results indicated that diagnostic criteria partially explained between-study variation. Limitations included incomplete methodological factors (e.g., response rates) in some studies and exclusion of studies not reporting kappa standard errors. Conclusion: Our results indicated good test-retest reliability of SDIs for adult psychiatric disorders, but with substantial between-study heterogeneity influenced by disorder and diagnostic criteria, depending on the type of disorder being assessed. These findings raise questions about the strength of published evidence on the reliability of SDIs and their usefulness in clinical and research contexts.

Weiyi Xie, McMaster University

A posteriori defined dietary patterns and prostate cancer risk: a systematic review and meta-analysis of prospective cohort studies

Prostate cancer (PCa) is the second most common cancer among men. Among the possible modifiable risk factors, diet is suspected to play a role in the development and progression of PCa. Data-driven (a posteriori) identified dietary patterns offer a realistic representation of eating habits and capture complex dietary exposure more accurately. This systematic review and meta-analysis examines the association between a posteriori dietary patterns and PCa risk. A literature search was conducted in PubMed, Web of Science, Embase, Cochrane library, to identify all prospective cohort studies on this topic. A meta-analysis comparing the highest versus lowest adherence levels, was conducted using random-effects model on the predominant patterns. Six prospective cohort studies were included. Two studies showed no association with PCa risk while two studies reported a negative trend for the “Southern” (RRQ3vsQ1=0.6, CI95% [0.4-1.1], ptrend=0.08 and the “Prudent” diets (HRQ4vsQ1=0.76, CI95% [0.57-1.00], ptrend=0.08). A significant positive association for the “Westernized” dietary pattern was reported in a Japanese population (HRQ5vsQ1=1.22, CI95% [1.00-1.49], ptrend=0.02), and a positive trend was also reported for a similar diet in a Spanish population (HRQ4vsQ1=1.29, CI95% [0.96;1.72], ptrend=0.07). Across studies, two main dietary patterns were consistently identified: a “Western” dietary pattern mainly described as rich in red and processed meats with sweets and desserts, and a “Prudent” diet mainly described as rich in fruits and vegetables, fish and seafood. The meta-analysis showed no evidence of association: HRPooled=1.07, CI95% [0.93-1.22], pvalue=0.34 and HRPooled=0.98, CI95% [0.91-1.06], pvalue=0.57, for the “Western” and the “Prudent” pattern, respectively. Our results suggest that differences among individual studies are likely driven by the population specificity, while the meta-analysis shows consistent results with low heterogeneity. Given the limited number of studies and the complexity of dietary exposure, further studies are needed to validate these findings.

Farah Ben Souilah, Université Laval

Post-treatment physical activity levels and ovarian cancer recurrence

Background: Ovarian cancer is one of the most lethal malignancies, and survivors often seek strategies to improve their prognosis. While known prognostic factors are clinical or biological in nature (e.g., cancer stage, grade) and not modifiable, lifestyle factors like physical activity have been associated with improved survival in several cancers. However, evidence for this association in ovarian cancer remains limited. Objective: We explored post-treatment levels of total moderate-to-vigorous physical activity (MVPA) (i.e., from recreational, occupational, transportation, and household domains) in relation to ovarian cancer recurrence. Methods: In a prospective cohort study of 97 high-grade ovarian cancer survivors, physical activity and other factors were reported at 6 months (baseline) and 10 months after the end of chemotherapy. Total MVPA was dichotomized as meeting versus not meeting guidelines for cancer survivors (i.e., ≥360 MET-minutes/week). Kaplan-Meier recurrence-free survival curves for meeting versus not meeting total MVPA guidelines at baseline were compared using the log-rank test. Hazard ratios (HRs) and 95% confidence intervals (CIs) for the association between total MVPA and recurrence were calculated using Cox proportional hazards models. Models were adjusted for the minimal set of confounders identified with a directed acyclic graph (i.e., age and cancer stage at diagnosis, body mass index, smoking, and education level). Results: There were 47 recurrences during a median follow-up of 18.5 months. Kaplan-Meier survival curves showed that women who met total MVPA guidelines at baseline had a lower probability of recurrence during follow-up (p=0.04). The adjusted HR (95% CI) for meeting versus not meeting total MVPA guidelines at baseline was 0.46 (0.22-0.97). The association was similar when total MVPA at 10 months was also considered, i.e. with time-varying exposure (adjusted HR=0.49; 95%CI, 0.20-1.17). Conclusion: Higher physical activity levels after treatment may reduce the risk of ovarian cancer recurrence. Further analyses will examine walking and sedentary behavior.

Mélanie Benoit

Dietary patterns and risk of inflammatory bowel disease: A life course approach

Background: Diet at different life periods may influence inflammatory bowel diseases through gut microbiota modulation. Objective: We used a life course approach to estimate the extent to which childhood and early adulthood dietary patterns are associated with the risk of Crohn's disease (CD) or ulcerative colitis (UC) later in life, and to test whether these associations are best explained by a critical, accumulation, or sensitive period hypothesis. Methods: We analyzed data from a case-control study nested within a Quebec birth cohort (born in 1970-1974). Cases and randomly selected controls were identified using administrative data. A self-reported questionnaire assessed food frequency intakes at ages 10 and 20, and lifestyle factors. Dietary patterns were identified with principal component analysis. We used the Bayesian relevant life course exposure model to estimate the 1) lifetime effect adjusted for confounders [Odds ratio (OR) and 95% credible interval (95% CrI)] per 5-unit increase in dietary pattern score and 2) relative importance of two life periods [weight in childhood (Wc) and adulthood (Wa)]. Results: A total of 946 controls, 936 CD and 469 UC cases were included. Two dietary patterns emerged in both childhood and adulthood (Healthy – high fiber and vegetables; Western – high fat and sweets). A higher Healthy pattern score decreased lifetime risk of CD (OR=0.83; 95% CrI: 0.76-0.90; Wc=0.25, Wa=0.75), less markedly for UC (OR=0.94; 95% CrI: 0.84-1.04; Wc=0.63, Wa=0.37). A higher Western pattern score increased CD (OR=1.20; 95% CrI: 1.07-1.33; Wc=0.66, Wa=0.34) and UC risk (OR=1.12; 95% CrI: 0.99-1.26; Wc=0.52, Wa=0.48). Results are compatible with a sensitive period hypothesis for all associations except the last one (accumulation). Conclusion: Healthy and Western dietary patterns were respectively associated with lower and higher risk of CD and UC. There may be sensitive periods for the effect of diet on inflammatory bowel disease, warranting further investigation.

Canisius Fantodji, Centre de recherche du CHUM (CRCHUM), Postdoctoral researcher

Evaluating the Reliability of the Canadian Food Intake and Canadian Eating Practices Screeners: Insights from a Cross-Sectional Study

Background: In 2019, Health Canada released an updated Canada's Food Guide which offered recommendations on healthy food choices and eating habits. The Canadian Food Intake (CFIS) and Canadian Eating Practices screeners (CEPS) were developed as quick and practical ways to assess how well adults' dietary intake aligns with the 2019 Canada's Food Guide recommendations . Objective: To assess the test and re-test reliability of the CFIS and CEPS. Method: Cross-sectional data were virtually collected using a Canadian marketing firm to recruit diverse ages, balanced by sex, and race quotas to match the Canadian population. Participants (n=1,927) completed the CFIS (n=16 items) and CEPS (n=21 items) at baseline and were asked to complete the same questionnaires 14 days later. Test-retest reliability was evaluated using Intraclass Correlation Coefficient (ICC) Shrout-Fleiss model. Results: The sample mean age was 50 years (51.17% female). The CFIS ICC ranged from 0.49 to 0.61. The lowest reliability (ICC=0.49) was observed for refined grain consumption (e.g., pasta), while the highest (ICC=0.61) was for plant-based beverage intake (e.g., soy milk). The CEPS ICC ranged from 0.19 to 0.67. Survey items with lowest reliability (ICC values ranging from 0.19 to 0.30) assessed participants' pleasure of trying new foods, their enjoyment of cooking, tendency to check nutrition labels when purchasing new foods or drinks, and awareness of the influence of food advertisements. The most reliable item (ICC=0.67) measured whether participants ate slowly. Conclusion: Test-retest reliability was moderate for the CFIS, but was more variable for the CEPS. Findings suggest that while the screeners provide insight into short-term dietary behaviours, they may not fully capture participants' typical long-term food choices. Future studies should incorporate additional re-tests to enhance the understanding of food intake and eating behaviours among Canadians.

Cynthia Comeau, Altasciences, Sample Management Technician 2

Accuracy of reported energy intake: A doubly labeled water validation study of the Goldberg method combined with questionnaire-derived physical activity levels (PAL)

BACKGROUND: Dietary intake misreporting is widely acknowledged in nutritional epidemiology. The Goldberg method has been proposed as an option for identifying under-reporters of energy intake (EI) in large epidemiologic studies. However, its implementation remains limited given the challenges associated with estimating physical activity levels (PAL) – a critical component. OBJECTIVE: To quantify the accuracy of the Goldberg method to classify EI misreporting using Sedentary Time and Activity Reporting Questionnaire (STAR-Q)-derived PAL-STAR-Q compared with doubly labelled water (DLW)-derived total energy expenditure (TEE DLW). DESIGN: Between 2009 and 2011, 99 weight-stable men and women (mean [SD]: 48 [8] years) completed a two-week DLW protocol, the Canadian Diet History Questionnaire I, and the STAR-Q, a comprehensive past-month activity questionnaire. TEE-DLW was the criterion measure of EI to determine the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy (proportion correctly classified as under-reporters or acceptable reporters) of Goldberg cut-points based on the PAL-STAR-Q. A global PAL of 1.55 frequently used in the classic Goldberg method was also studied for comparison. RESULTS: The Goldberg method using PAL-STAR-Q classified 58% of men and women as under-reporters, compared with 60% of men and 56% of women identified with TEE-DLW. Among men, values for sensitivity, specificity, PPV, NPV and accuracy of the Goldberg method and PALSTAR-Q were estimated as: 88%, 87%, 91%, 81%, and 87%, respectively. Among women, these values were: 79%, 69%, 77%, 72%, and 75%, respectively. Substituting a PAL of 1.55 for the PAL-STAR-Q reduced the proportion of men and women classified as under-reporters to 35% and 19%, respectively, lowered sensitivity to 54% and 33%, and increased specificity to 93% and 100%. CONCLUSIONS: Population-specific validation sub-studies using the Goldberg method and validated questionnaire-derived PALs may be informative for gauging the extent of EI misreporting in large-scale epidemiologic studies lacking objective EI measures.

Ilona Csizmadi, University of Calgary

Dietary intake and quality of school meals among Canadian school-aged children: A hierarchical analysis of meal-based dietary data

Background: Analyzing meals instead of individual intake in nutritional epidemiologic studies (meal-based analyses) can capture meal-specific variation, contribution, and context. Objectives: We used meal-based analyses to compare the diet quality of meals offered in Canadian schools with those sourced from home. Methods: Dietary data were derived from a cross-sectional survey of 2,366 students (age 9-14 years, 49% girls) from 32 schools in Alberta and Ontario. Students completed a 24-hour diet recall, indicating foods/drinks and their sources (school, home) for each meal consumed during school hours (breakfast, morning snack, lunch, afternoon snack). Hierarchical linear models (meals clustered within students) were used to assess the association between meal source and dietary outcomes, including food group servings (vegetables/fruit, dairy, grains), intake of free sugars, and diet quality as assessed using the Diet Quality Index – International (DQI-I). Logarithmic transformations were applied to zero-inflated outcomes. Effect estimates are presented as back-transformed coefficients with 95% confidence intervals and interpreted as percent increases or decreases in the outcome. Results: Among 8,590 meals consumed during school hours, only 4% were provided by schools. Compared to home-brought meals, school meals were associated with fewer servings of vegetables/fruit (β: -16.1, 95% CI: -26.0 to -4.8) and grains (β: -14.0, 95% CI: -21.8 to -5.5), but more servings of dairy (β: 25.0, 95% CI: 9.8 to 42.4). School meals were associated with lower free sugar content than home-brought meals (β: -33.4, 95% CI: -45.4 to -18.9). School meals were associated with higher DQI-I scores than home-brought meals, although this difference was not statistically significant. Conclusion: By using clustering and transformations to circumvent the challenges of meal-based dietary data, we found that school meals provide children with more dairy products and less free sugars but include fewer servings of vegetables/fruit and grains than meals sourced from home.

Julia Dabravolskaj, St. Michael's Hospital, Senior Research Associate

On the use of quantile-regression-based DEXA phenotypes to assess health risks

Background: Four mutually exclusive phenotypes based on whether an individual was above or below the median of dual energy X-ray absorptiometry (DEXA) measured fat and muscle mass indices for their respective sex and age reference curves have been proposed. However, this methodology may not properly characterize patients in the distribution tails. Objectives: Extend the DEXA phenotype classification through additional centile cut-offs beyond the median, thereby allowing us to better identify tail behavior. Methods: Data was from NHANES (2011–2018: n=4,236; average age=39.1 years; 50.3% male), a representative sample of the general U.S. population. Quantile regression was used to construct DEXA-measured fat-mass and muscle-mass phenotypes. The health risks considered include metabolic syndrome (MetS), depression, insufficient sleep, general health, physical functioning, and whether the patient presented with at least 2 illnesses (co-morbidity). Analyses used logistic regression (adjusted for age, sex, and race) and incorporated the complex sampling design and survey weights. Quantile and median-split models were compared using the Akaike information criterion, as well as the positive and negative likelihood ratios. Results: Quantile regression identified nine DEXA phenotypes: the high adiposity (>75%cile) with high muscle mass (>75%cile) phenotype had the highest risk for MetS (OR=3.67, 95% CI=2.75, 4.90) relative to the average adiposity (25%-75%ile) with average muscle mass (25%-75%cile) phenotype. The low adiposity (<25%cile) with high muscle mass (>75%cile) phenotype had the lowest risk (OR=0.23, 95% CI=0.02, 2.20). Results were consistent across other health measures. The median split also identified the high adiposity (>50%cile) with high muscle mass (>50%cile) phenotype as the highest risk group (OR=3.38, 95% CI=2.30, 4.96). The quantile regression results were not significantly different from the median-split. Conclusion: Although quantile regression separately captured patients in the distribution tails, results were not superior to the median-split. Whether the classification performances diverge in longitudinal studies should be investigated.

Anthony Forgetta, Concordia University, MASc Candidate - Software Engineering

Temporal Trends in Prepregnancy Body Mass Index and Gestational Weight Gain in Ontario Over the Past Decade: A Population-Based Descriptive Study

Background: Gestational weight gain (GWG) and prepregnancy body mass index (BMI) are modifiable determinants of maternal and child health. Despite their importance, there is a lack of recent data on trends in GWG and prepregnancy BMI in Canada. Objectives: The objectives of this research were to describe the trends in GWG and prepregnancy BMI in Ontario from 2012 to 2022. Methods: We conducted a descriptive study using population-based data from the Better Outcomes Registry & Network (BORN), which collects information on all births in Ontario. GWG was analyzed as a continuous variable and categorically (inadequate, adequate, excessive) based on Institute of Medicine guidelines. Prepregnancy BMI was also evaluated continuously and categorically using World Health Organization classifications (underweight, normal weight, overweight, and obesity classes). Temporal trends were visualized using annual means and proportions with 95% confidence intervals. We used generalized estimating equations to examine temporal trends, with adjustment for socioeconomic, medical, and fetal factors. Results: Among 1,054,973 births, mean pre-pregnancy BMI increased by 0.22 per year (95%CI: 0.21, 0.22) over the study period, with the distribution shifting toward higher weight categories as the proportions of underweight and normal weight individuals decreased while overweight and obesity categories increased. Mean GWG declined from 14.26 kg in 2012 to 13.78 kg in 2019, then increased to 14.19 kg by 2021. Unadjusted GWG decreased by 0.081 kg/year (95% CI -0.085, -0.076), but after adjustment for socioeconomic, medical, and fetal factors, no annual change was observed (β = 0.001 kg/year, 95% CI: -0.004, 0.005). Stratification by BMI revealed an inverse gradient, where individuals with underweight BMI gained the most weight (15.16-15.91kg), while those with class III obesity demonstrated the least weight gain (8.34-10.83kg). However, these GWG ranges still did not meet the current IOM recommendations with excessive GWG increased from 52.8% to 55.2%, adequate GWG decreased from 28.9% to 26.9%, and inadequate GWG decreased from 28.85% to 26.85% over the study period. Conclusion: Mean pre-pregnancy BMI increased over the study period, with the distribution shifting toward higher weight categories. GWG and adherence to GWG guidelines changed minimally over the study period, with a slight uptick during the COVID-19 pandemic. Despite BMI-category-specific trends in the right direction, GWG ranges do not comply with IOM weight recommendations.

Sahar Khademioore, McMaster University

Diet quality and change in weight among young adult women and men in a prospective cohort in Canada

Background: Excess and progressive weight gain in young adults can lead to serious health consequences in the short- and long-term. Although poor diet quality is linked to weight gain and obesity in older adults, it is not an established risk factor for weight gain in young adults. Objective: We examined the association between diet quality and weight change in young adulthood. Methods: We conducted this longitudinal analysis using data from 227 women and 129 men from the 25-year Nicotine Dependence in Teens study. Scores for the 2015 Canadian Healthy Index (C-HEI-2015) were computed to measure diet quality at age 24, and weight was measured at age 24 and 31. We used multivariable linear regression to estimate beta coefficients (β) and 95% confidence intervals (CIs) for the association between the CHEI-2015 scores at age 24 and weight at follow-up at age 31, adjusting for confounders, including baseline weight. This approach estimates “exogenous” weight change, which is independent of baseline weight and potentially modifiable, making it relevant for intervention. We also stratified analyses on baseline BMI categories. All analyses were stratified by sex. Results: For a 10-unit increase in the C-HEI-2015 score, the β (95% CI) for weight was -0.13 (-1.31; 1.06) kg in women and 0.50 (-0.68; 1.66) kg in men, on average, suggesting little influence of diet quality on weight change 6.6 years later. However, in women with overweight or obesity at age 24, a 10-unit increase in C-HEI-2015 was associated with weight reductions of 1.19 kg (-5.49; 3.12) and 5.55 kg (-16.40; 5.30), respectively. In overweight men, the reduction was 0.72 kg (-5.79; 4.35). Conclusion: High diet quality in young adulthood has the potential to limit weight gain, particularly in women with a higher weight. Further exploration in large population-based samples of young adults is needed.

Kevin L’Esperance, Stanford University

Exploring the role of physical activity on the neighbourhood-adiposity relation in youth: an application of VanderWeele’s 4-way decomposition method.

Background: Neighbourhood features are implicated in obesity among youth, through shaping behaviours like physical activity. Objectives: To estimate gender-specific average exposure effects of neighbourhood features on adiposity in children, and the contribution of moderate-to-vigorous physical activity (MVPA). Methods: Data were from QUALITY, an ongoing investigation of the natural history of obesity in 630 Quebec families. Neighbourhood exposures (pedestrian aids, traffic-calming features, disorder, #parks) were assessed in 2008-10 using on-site audits and GIS, ranked from least to most favourable. DXA-derived fat mass index (FMI) and accelerometer-based MVPA were measured 2 years later. VanderWeele’s 4 way decomposition method was performed with each exposure to estimate the contributions of MVPA. Sex-specific models controlled for age, income, parental education, and season. Results: The mean age of participants (250M/204F) was 11y. Boys and girls accumulated 47.4 (SD: 18.7) and 36.1 (SD: 15.4) minutes/day of MVPA on average. The total effect of adiposity on neighbourhood features ranged from -2.95 to -2.81. There was little mediation by MVPA of the effect of neighbourhood features on adiposity (0.04 to 0); however, MVPA was a modifier for pedestrian aids and traffic-calming features. We estimated the effect of changing the number of pedestrian aids from none to the sample average. Fixing the mediator to recommended MVPA (30 minutes), the effect of pedestrian aids on FMI was favourable (-1.73). With MVPA set to 15 and 60 minutes/day, estimated reductions in FMI were -1.88 and -1.44. The effect of changing traffic-calming features from none to the most favourable category, at recommended MVPA, was -2.08 FMI. At cut-points set to 15 and 60 minutes/day, estimated reductions in FMI were -3.77 and 1.86. No meaningful associations emerged with disorder, #parks, or among girls. Conclusion: 4-way decomposition is a valuable method for disentangling direct and indirect pathways, providing insight into the mechanisms underlying youth adiposity.

Ana Lungu, McGill University

Associations between the Canadian Food Intake and Canadian Eating Practice Screeners with dietary intake in adults: Insights from a cross-sectional Canadian sample

Objective: To assess dietary quality and eating behaviors of Canadians, Health Canada released in 2019, the Canadian Food Intake Screener (CFIS) and the Canadian Eating Practices Screener (CEPS). Although they are designed to be a diagnostic tool, there is limited data on their utility. Hence, this study used the screeners to investigate how eating behaviors and dietary quality relate to the consumption of the major food groups. Method: A sample representative of the Canadian population was recruited through Leger (n=1674, mean age 49.8 years, 51.2% female). Total CFIS (range: 1-65, n=16 items, such as how much fruit was consumed in the past month), and total CEPS (range: 21-105, n=21 items, such as how often meals are planned ahead of time) scores were converted to tertiles, one for each screener. Multiple linear regressions were used to assess whether CFIS tertile scores and CEPS tertile scores were associated with the consumption of the following food groups: fruits, vegetables, animal- and plant-based protein, and dairy (adjusted for sex, age, and highest education level). Results: Compared to the lowest tertile, higher tertiles of both the CFIS and CEPS were associated with greater intake of major food groups. For example, compared to the lowest CFIS tertile, CFIS tertile 1 and 2 were associated with greater fruit consumption (B=2.954, p<0.0001; and B=2.954, p<0.0001, respectively). Compared to the lowest CEPS tertile, CEPS tertiles 1 and 2 were associated with greater vegetable consumption (B=0.982, p<0.0001; and B=1.307, p<0.0001, respectively). The smallest difference was for plant-based protein when comparing CEPS tertile 1 to the lowest tertile (B=0.432, p<0.0001). Conclusion: This research demonstrates the alignment between higher scores on the CFIS and CEPS screeners and higher intake of major food groups. Research on how these screeners relate to meeting dietary recommendations and other health behaviours is needed.

Vinh Tuong (Tony) Nguyen, Concordia University, Undergraduate student

Adherence to Canada's 24-Hour Movement Guidelines and variations in types and contexts of movement behaviours across adherence

Background: Canada's 24-Hour Movement Guidelines recommend integrating optimal levels of physical activity, sedentary behaviour and sleep in a 24-hour period to promote health. No up-to-date rates of adherence among Canadian community-dwelling adults are available, and the variability in movement behaviours in different contexts during the day is poorly understood. Objectives: The objectives were to examine adherence to the Canadian 24-Hour Movement Guidelines in young adults and to describe how the types and contexts of movement behaviours vary across levels of adherence to the Guidelines. Methods: A cross-sectional analysis was conducted using 2023 data from an ongoing longitudinal study. Participants (mean age 35 years) self-reported their light, moderate and vigorous physical activity, sedentary behaviour (screen time for work/school and leisure, time spent sitting, on weekdays and weekends) and sleep (sleep duration, sleep quality). Adherence was defined as: (i) >150 min/wk moderate-to-vigorous physical activity (MVPA), (ii) <7 hours/day sitting time including <3 hours/day of recreational screen use, and (iii) 7-9 hours of sleep. Results: Among 702 participants, 87.7% adhered to at least one guideline, 37.4% adhered to two and 16.4% adhered to all three guidelines, while 12.3% adhered to none. More specifically, 69.3%, 46.2%, and 42.6% adhered to the sleep, MVPA, and sedentary behaviour guidelines, respectively. Compared to those adhering to all guidelines, participants who did not adhere reported higher screen use for work/school on weekdays, as well as higher recreational screen use and more hours spent sitting on both weekdays and weekends. They reported almost no MVPA. Participants who adhered to all guidelines also spent more time walking. Sleep duration did not vary across groups, but participants who adhered to all guidelines reported better sleep quality. Conclusion: Our findings shed light on movement behaviours among young adults and can inform targeted interventions to improve adherence to Canada's 24-hour Movement Guidelines.

Teodora Riglea, Université de Montréal

Alternate Healthy Eating Index -2010 scores and B-vitamins are associated with better cognitive performance among females in a cross-sectional representative U.S. sample

Cognitive decline is a growing concern among aging populations. Lifestyle choices, such as diet, play an important role in slowing down or preventing impairment. This study investigates the relationship between diet quality, assessed using the Alternate Healthy Eating Index-2010 (AHEI-2010), and the intake of specific B-Vitamins (B6, B9/folate, and B12) with cognitive function in a representative sample of U.S. adults aged 60 and older. Using cross-sectional data from 2,299 participants in the 2011–2014 National Health and Nutrition Examination Survey (NHANES), cognitive performance was evaluated through immediate and delayed recall (CERAD Word List), verbal fluency (Animal Fluency), and processing speed/executive function (Digit Symbol Substitution Test). Linear regression models were used to evaluate the association between AHEI-2010 scores and B-Vitamins with the cognitive test measures in separate regression models. All models adjusted for sex, age, race, education, smoking status, body mass index (BMI), and health conditions and incorporated the complex study design and sampling weights. Models were additionally sex-stratified. Linear regression analyses revealed that higher AHEI-2010 scores, indicating better dietary adherence, were statistically significantly associated with better delayed recall, processing speed, and verbal fluency ($p<0.05$). Among B-vitamins, greater intake of vitamin B6 and folate showed strong positive associations with better cognitive performance, particularly in delayed recall and processing speed ($p<0.05$). These associations were more pronounced among females, showing potential sex differences in dietary impacts on cognition. This study combined dietary assessments and neuropsychological tests, providing an understanding of how diet influences cognitive health. Findings suggest that a diet aligned with AHEI-2010 guidelines, emphasizing fruits, vegetables, and whole grains, while ensuring adequate intake of B vitamins, may support cognitive function in older adults, particularly among females. These results contribute to nutritional epidemiology and extend additional insights for cognitive science disciplines exploring the interplay between lifestyle factors and brain health.

Nadezhda Velchovska, Concordia University

Portrait of occupational multiexposures and chronic respiratory diseases in the CARTaGENE study

Background: Occupational exposures may be an important determinant of respiratory health, and they have traditionally been evaluated individually. Few studies consider the impact of multiple simultaneous exposures; yet many workers are exposed to multiple substances and multiexposures may have combined effects if they act on the same organ. Objectives: Portray occupational multiexposures experienced by CARTaGENE participants overall, and among those with a diagnosis of asthma, chronic bronchitis, emphysema and lung and bronchial cancer. Methods: CARTaGENE, the largest ongoing prospective cohort in Quebec, comprise 19,985 men and women aged 40 to 69 at recruitment (2009-2012). Respiratory disease diagnoses were self-reported by participants, except for incident cancer cases which were identified via linkage with the Quebec cancer registry. Participants self-reported their longest-held job; occupational exposures to 159 agents were determined via linkage with a job-exposure matrix (CANJEM). Sixty-four agents with ≥100 participants exposed were included. Frequent itemset mining was used to extract frequent multiexposures. Results: In total, 15,521 participants were included, 7,370 were exposed to at least one agent, and 5,990 were multiexposed (median=5 agents). Participants that were multiexposed were most frequently exposed to the following combinations: cleaning agents–biocides, lead compounds–PAHs, and exhaust gases–PAHs. Among included participants, 1,330 had a diagnosis of respiratory disease occurring at least one year after starting their longest-held job. A similar multiexposure profile was observed for all case groups, with cleaning agents and biocides being the most frequent. Specifically, co-exposure to cleaning agents and biocides were found in 16% of participants with asthma, 13% with incident lung/bronchial cancer, and 15% among all respiratory diseases versus 14% of healthy participants. No notable differences were observed when comparing the multiexposure profiles by disease status. Conclusion: Despite the lack of observed differences, this study represents a first step towards hypothesis building for the health effects of various occupational multiexposures.

Jérôme Fortier, Université de Montréal

Facteurs prédictifs de l'absentéisme au travail chez les personnes vivant avec une maladie chronique : Analyse de l'Enquête sur la santé des collectivités canadiennes.

Contexte: Les maladies chroniques sont une cause majeure d'absentéisme au travail, nécessitant l'analyse des facteurs prédictifs associés. Objectifs: Estimer la prévalence de l'absentéisme chez les travailleurs canadiens en fonction des maladies chroniques, identifier les facteurs prédictifs de l'absentéisme chez les travailleurs atteints de maladies chroniques. Méthode: L'étude inclut 52,947 répondants de l'Enquête sur la santé dans les collectivités canadiennes (2010-2011 et 2013-2014) âgés de 15 à 75 ans. La prévalence de l'absentéisme au travail a été calculée en divisant le nombre de travailleurs ayant manqué une journée de travail ou plus dans les trois derniers mois par le total des travailleurs, et le total des travailleurs souffrant d'une maladie chronique. Un modèle de régression binomiale négative a été utilisé pour estimer les ratios de prévalences(PR)et identifier les facteurs prédictifs de l'absentéisme chez les travailleurs avec maladies chroniques. Résultats: La prévalence de l'absentéisme au travail était de 18,6%, les prévalences d'absentéisme spécifiques étaient de 5,9% pour les travailleurs souffrant de problèmes de dos et 0,5% pour ceux ayant un cancer. Les facteurs prédictifs de l'absentéisme au travail chez les travailleurs avec maladies chroniques identifiés incluent le cancer(PR:2,94[2,91–2,97]), les maladies cardiovasculaires(PR:2,08[2,07–2,09]) et les troubles de l'humeur(PR:2,02[2,02–2,03]),le travail à temps partiel(PR:0,77[0,77–0,78]),l'âge avancé (RCP:0,81[0,81–0,82]).Le nombre moyen de jours d'absence pour raisons de santé était de 1,35 jour. Le cancer, les maladies cardiovasculaires étaient les plus associées à l'absentéisme, avec respectivement 2,8 et 1,6 jours d'absence supplémentaire. Conclusion: Les maladies chroniques augmentent l'absentéisme au travail, générant des coûts économiques considérables et soulignant l'urgence de mettre en place des mesures préventives efficace.

Tinhinane Kermiche

Lifetime occupational exposure to endocrine-disrupting chemicals and postmenopausal breast cancer risk

Background: Occupational exposure to endocrine-disrupting chemicals (EDCs) is a potential risk factor for postmenopausal breast cancer. Prolonged estrogen exposure, a known risk factor, may be exacerbated by EDCs that mimic estrogen (estrogenic) or disrupt androgen activity (anti-androgenic). Yet, studies have focused on individual chemicals rather than the complex mixtures women encounter at workplaces. Objectives: To estimate the association between lifetime occupational exposure to select EDCs, grouped by biological mode of action, and postmenopausal breast cancer risk. Methods: Data from a population-based case-control study (2008-2011) among postmenopausal women in Montreal was used. Cases included 695 women diagnosed with malignant breast cancer, frequency-matched to 608 controls by age. Lifetime occupational history and risk factor data were collected by interview. Two industrial hygienists used occupational histories to assign exposure to 24 EDCs that were subsequently classified by their mode of action (estrogenic, anti-estrogenic, and anti-androgenic). Exposure metrics derived included: 1) ever/never exposed, 2) duration of exposure (per 5-years), and 3) cumulative exposure (per interquartile range). Unconditional multivariable logistic regression was used to estimate adjusted odds ratios (OR) and 95% confidence intervals [95% CI] for the association between breast cancer and lifetime occupational EDC exposure. Results: Ever exposure to any of our 24 EDCs was in 18% of cases and 14% of controls. Ever exposure to estrogenic EDCs (OR=1.42 [0.90, 2.27]) and anti-androgenic EDCs (OR=1.48 [1.07, 2.08]) showed a similar increase in postmenopausal breast cancer risk compared to anti-estrogenic (OR=1.13 [0.77, 1.68]). Similar trends were observed using the duration metric. Although not significant, cumulative exposure to anti-androgenic EDCs (OR=1.16 [0.92, 1.49] yielded a similar risk increase to estrogenic EDCs (OR=1.11 [0.92, 1.40]) compared to a protective effect from anti-estrogenic EDCs (OR= 0.96 [0.74, 1.24]). Conclusion: Occupational exposure to EDCs by mode of action (especially anti-androgenic) increases postmenopausal breast cancer. Analyses are ongoing considering alternative confounder adjustment strategies.

Christina Reeves, Queen's University, Graduate Student

Maternal Near-Miss and Quality of Care in First - Level Referral Hospitals in Inhambane, Southern Mozambique – A Mixed-Methods Study

Background: Pregnancy-related complications continue to significantly affect the lives of women worldwide. Women in sub-Saharan Africa, account for nearly two-thirds of global maternal deaths. The WHO recommends monitoring maternal near-misses (MNM) (of deaths), as this approach provides a better understanding of the quality of care women receive at the health facility. Mothers who experience severe complications, such as severe pre-eclampsia, or postpartum hemorrhage, often share common risk factors. Objective: Investigate the incidence-proportion of MNMs, its associated risk factors, and how mothers describe their experience of a near-miss critical event. Methods: A cross-sectional, explanatory sequential designed mixed-methods study was conducted from June 6 to December 9, 2022, using the Mozambique-Canada Maternal Health project criteria for MNM at two regional hospitals in Mozambique. Six hundred thirty-eight participants were enrolled in the study, and 43 of them participated in qualitative interviews. We performed a multivariable logistic regression analysis after checking for multicollinearity using the VIF and standard error. The intra-facility correlation was adjusted using the Huber-White standard error estimator. We used grounded theory methodologies to analyze the qualitative data. Results: The incidence proportion of MNM is 147 per 1,000 live births (14.7%). Age, distance travelled, ANC visits, labour onset, and multiple deliveries were significantly associated with MNM. Older mothers (>35 years), with multiple deliveries, referred for care before labour were more likely to experience an MNM. Mothers living more than eight kilometres from the hospital had lower odds of an MNM. Women's experiences of an MNM fell under four themes: becoming near-miss, co-morbidities, distance travelled, and poor risk awareness of maternal complications. Conclusion: The quality of ANC care women receive needs improvement. Unlike maternal deaths, women who survive an MNM have a story to tell. These narratives provide a better understanding of the underlying factors contributing to MNM cases.

Fernanda Andre, University of Saskatchewan , Doctoral student

Practice Variations in the management of moderate to severe traumatic brain injuries in Canadian children

Background: Traumatic brain injury (TBI) is a major cause of trauma-related death and disability in children. Several internationally recognized clinical organisations publish clinical practice guidelines (CPGs) recommendations on pediatric. Despite the fact that adherence to evidenced-based recommendations has been shown to reduce mortality, length of hospital stay and improve functional outcomes in children with TBI without increasing hospital costs, significant variability in the use and implementation of CPGs persists. Objectives: This study aims to evaluate inter-hospital and interprovincial practice variations in the management of children <16 years old admitted to a Canadian hospital center with moderate to severe TBI. Methods: We conducted a multicenter retrospective cohort study using hospitalization data of children < 16 years old with a diagnosis of moderate to severe TBI in all Canadian provinces except Quebec between 04/01/2016 and 03/31/2021. We performed multilevel logistic regression models with random intercept. Results: There are significant differences between provinces regarding several practices: emergency waiting time of less than 4 hours, admission/transfer to a pediatric center, measurement of the Glasgow Coma Scale and imaging. Significant differences between hospitals in the same province were also found regarding emergency waiting time of less than 4 hours, admission to intensive care unit and imaging. Conclusion: Our study is the first to describe practice variations for the management of moderate to severe pediatric TBI in Canada. There are significant interprovincial and interhospital differences.

Anis Ben Abdeljelil

Beyond Parent Perspectives: A Randomized Controlled Trial of Triple P and Circle of Security Parenting on Child-Reported Parenting Practices

Background: Parenting quality fundamentally shapes child development and well-being. Harsh parenting has detrimental effects on cognitive, emotional, and social development. Parenting programs aim to improve parenting skills, knowledge, and behaviour, thereby enhancing developmental outcomes. Many evaluations of parenting programs rely on parent self-report measures for study outcomes, introducing a notable risk of bias and necessitating multi-informant and diverse outcome measures. Objectives: This sub-study tested the effect of two parenting programs, Triple P-Positive Parenting Program and Circle of Security (COSP), compared to treatment as usual (TAU), on parenting practices via child report 12 months post-intervention in a multi-site randomized controlled trial (RCT). Exploratory analyses assessed intervention effects on parent-reported harsh and lax parenting practices, perceived self-efficacy, and depression 12 months post-intervention. Methods: Participants (n=92) were at-risk parents of children aged 2-6 years who were randomly assigned to Triple P (n=24), COSP (n=26), and TAU (n=42). Twelve months post-intervention, an adapted Parent-Child Conflict Tactics Scale was used for child reports of parenting practices – items included distraction, toy removal, reasoning, and timeout. Parent self-reports were also obtained to measure parent laxness, overreactivity, and depressive symptoms. The effectiveness of Triple P, COSP, and TAU on child- and parent-reported outcomes were compared using analysis of covariance (ANCOVA) models. Results: ANCOVA results indicated no statistically significant differences in mean child-reported parenting practices, parent laxness, overreactivity, self-efficacy, and depression between groups (COSP, Triple P, TAU) at 12 months ($p>.05$). Conclusion: Although we did not find a significant difference between groups, we were able to successfully administer a novel child task to assess child reports of parenting within the context of a RCT. Future studies should examine ways to expand on the child task.

Fatemeh Ilkhani, Strong Families Lab, Research Assistant

Impacts of the Healthy Families, Healthy Babies (HFHB) Targeted Prenatal Program on Pregnancy, Birth and Early Life Nutritional and Developmental Outcomes in New Brunswick

Targeted public health (PH) programs are offered to families at high risk of poorer outcomes as a strategy to support healthy pregnancies and childhood development. While there is one in each province, there is limited research to inform programming efforts. We partnered with PH New Brunswick (NB) to undertake an outcome evaluation of NB's Healthy Families, Healthy Babies (HFHB) targeted prenatal program, to examine program impacts on stakeholder-selected pregnancy, birth, nutritional and developmental outcomes. A matched retrospective cohort of all live births in NB, between 2012 and 2020, among those having a baby for the first-time was developed using administrative data and followed over pregnancy and the first two years of life. Propensity score matching (PSM) was used to select a matched group using the nearest neighbour approach. Outcomes were selected by a program review committee involved in program management/delivery. Multivariable logistic regression was used to estimate risk difference (RD) and 95%CI. The birth cohort included 20 832 individuals, 2 000 of whom participated in the prenatal program. Residual confounding was expected due to poor PSM among those with the highest scores. Results do not demonstrate an impact of program participation on selected outcomes. A small positive impact was observed for risk of developing gestational hypertension (RD: -1.3% (-2.6 to 0.0)). Selection bias was observed due to low participation in the toddler assessment, which differed between groups according to important characteristics (e.g., substance use during pregnancy). This is among the first Canadian studies to evaluate the population-level impact of targeted PH prenatal services. It is important to develop a mechanism that enables more frequent outcome evaluation analyses to continually inform on effectiveness of program modifications. While this research represents an important contribution, more research is needed to inform program planning and delivery in Canada.

Sandra Magalhaes, NB-IRDT

Variations of healthcare utilizations among children with congenital heart disease by maternal immigrant status

Background: This study examines variations in health care service use among children with CHD by maternal immigrant status in Ontario. Methods: We conducted a retrospective population-based cohort study of hospital live births between April 2002 and September 2020 in Ontario, Canada, using data from ICES. We identified 103,396 patients born during this period with a diagnosis of CHD and followed them up to March 31, 2024. Maternal immigrant status was obtained from the Immigration, Refugees and Citizenship Canada (IRCC) permanent resident database. Outcomes included the numbers of hospitalizations and emergency room visits from birth to 17 years old. We performed multivariable negative binomial regression models to estimate adjusted rate ratios (aRR) to examine associations between maternal immigrant status and children's hospitalizations and emergency department visits while adjusting for infant sex, year of birth, children's residential rurality, neighborhood median household income and education quintiles, children's comorbidities, and severity of CHD (non-severe CHD, non-single-ventricle severe CHD, and single-ventricle CHD). Results: Compared to children born to non-immigrant mothers, children diagnosed with any type of CHD born to refugee mothers had higher hospitalization rates (aRR 1.15, 95% CI: 1.08-1.22). Children from non-refugee immigrant families had slightly lower hospitalization rates (aRR 0.94, 95% CI: 0.91-0.97) compared to those from non-immigrant families. Similarly, children with CHD with refugee mothers had higher ED visit rates (aRR 1.05, 95% CI: 1.01-1.09) compared to children from non-immigrant mothers, while children from non-refugee immigrant families had slightly lower ER visit rates (aRR 0.87, 95% CI: 0.86-0.88) compared to those from non-immigrant families. Conclusion: There are variations in acute care hospitalizations and ED visit rates among children with CHD based on maternal immigrant status. The findings suggest there may be inequity issues related to healthcare services for children with CHD in Ontario Canada. Further investigation is needed to study the mechanism.

Qun (Grace) Miao, BORN Ontario

Intersecting nutritional challenges among mother-child dyads in Mozambique: Findings from Demographic and Health Survey 2022-2023

Introduction/background: Nutritional challenges are a global public health concern, especially among children under five in sub-Saharan African countries. The seeming discordance, an overweight/obese mother and an underweight child, in the same household is recognized as a 'Dual burden of malnutrition.' Our study aimed to examine the prevalence and associated factors of this Dual burden of malnutrition among mother-child dyads in Mozambique. Methods: We used nationally representative data from the Mozambique Demographic and Health Survey 2022-2023 (n=3605 mother-child dyads). The children's undernutrition condition and maternal BMI status were calculated using WHO standard reference guidelines. The outcome variable, Dual burden of malnutrition, was created if the child had any undernutrition condition (stunting, wasting, or underweight) and their mother was overweight/obese. Multivariable binary logistic regression, Erreygers concentration index, and concentration curve were analyzed to determine associated factors and social inequalities. Results and analysis: The prevalence of Dual burden of malnutrition was 5.51%. Mothers older than 34 years, with more than four children, lived rurally and the household had poor sanitation access (unimproved toilet facilities) were significantly independently associated with experiencing Dual burden of malnutrition. Women who were older (>20 years) when their first child was born were less likely to experience Dual burden of malnutrition. Among younger mothers, 15-19 years, those whose scores placed them either in the highest or the lowest empowerment quintile were significant more likely to experience Dual burden of malnutrition. A positive and statistically significant concentration index suggests that household wealth-related inequalities exist among mother-child dyads. Conclusions and implications for policy, practice or additional research: Our study provides evidence on the Dual burden of mother-child malnutrition at the household level in Mozambique. Our findings underscore the need for targeted intervention to address social inequalities and household sanitation to improve maternal and child nutritional status.

Nahin Shakurun, USask

Child Health Research Using Linked Multi-Domain Canadian Administrative Data: A Scoping Review

Background: Multi-domain linked datasets that contain health and non-health information about children enable exploration of the interactions among biological, social, and environmental factors. Information about child health studies that use multi-domain Canadian administrative data can uncover common research themes, data types, key variables, and data gaps. This can inform strategies to improve data availability and study methods and explore innovative research topics. Objectives: To characterize existing child health studies that use Canadian health and non-health administrative data. Methods: A systematic search was conducted across MEDLINE, Embase, Scopus and Global Health from inception until March 12, 2025. Research articles were included if focused on children (18 years or younger), used Canadian administrative data, and integrated variables from health and non-health datasets. The latter included social (e.g., income, race, welfare involvement), educational (e.g., assessments, graduation rates), and justice factors (e.g., charges, incarcerations). Two reviewers independently screened all titles, abstracts and full texts with pilot testing to ensure reviewer consistency. Results: 4437 studies were identified, 1658 duplicates were excluded, and 2546 were excluded during title and abstract screening. The full-text screening of 233 studies retained 42 studies, with an inter-reviewer agreement of 77% during pilot testing and 93% during full-text screening of the remaining studies. Cohen's kappa coefficient, which accounts for chance agreement, was 0.82 (95% confidence interval: 0.73, 0.90). Disagreements were resolved through discussion until consensus was achieved. All 42 studies were conducted in a single province; most used data from Manitoba (49%) or Ontario (31%). The number of studies increased over time, with 51% published between 2020 and 2024. Conclusions: This scoping review identified 42 multi-domain linked child health studies using Canadian administrative data. The lack of multi-jurisdictional studies was identified as a gap. Next, full-text extraction will collect detailed study characteristics, such as populations, aims, data sources, and variables.

Yen Vuu, University of Manitoba, MSc Student

Assessing the link between long-acting contraception and risk of sexually transmitted blood-borne infections

Background: Sexually transmitted bloodborne infections (STBBIs) are surging across Canada, and people under 25 (particularly adolescent girls/ young women) are at increased risk. As disease incidence climbs, so does the promotion of long-acting reversible contraception (LARC) like intrauterine devices (IUDs). LARCs do not protect against STBBIs, and LARC users are less likely to use secondary forms of contraception (e.g., barrier methods) for this purpose. Existing findings on the relationship between LARC use and STBBI incidence are mixed, particularly in people under 25. Objectives: Synthesize evidence on LARC use and incident STBBIs (as defined by the Public Health Agency of Canada). Methods: Search engines included Medline, Embase, and CINAHL. We produced a narrative synthesis and a random effects meta-analysis (in progress) to summarize our findings; publication bias and study heterogeneity were assessed using funnel plots and I2 values. We adhered to PRISMA 2020 reporting guidelines. This review was preregistered in Prospero. Results: Our initial search yielded 898 studies, 45 of which met our inclusion criteria. Approximately 44% focused primarily on chlamydia and/or gonorrhea; the remaining 56% assessed incident HIV (26%), HPV (18%), and other /aggregated STBBIs (12%). Sub-Saharan Africa was the most common location (~38%); there were no Canadian studies. Designs were mainly observational with few (n=2) examining LARC/STBBI associations specifically among adolescents/young adults. Evidence on the association between LARC use and STBBI risk was strikingly contradictory, with roughly half reporting increased STBBI risk among LARC users and half pointing toward a null or protective association. Conclusion: Our findings underscore the need for additional high-quality research on LARC use and STBBI risk given contemporary trends in contraception, particularly among younger people. Differences in study design and analysis likely obscure the true relationship between LARCs and STBBI risk.

Nichole Austin

Long-acting reversible contraceptives and the risk of sexually transmitted blood-borne infections among Canadians under 25

Background: Sexually transmitted blood-borne infections (STBBIs) – specifically chlamydia and gonorrhea – are surging across Canada, especially among young women. The use of long-acting reversible contraceptives (LARC) is also increasing among young women, but they do not offer any protection against STBBIs. Objective: Estimate the population-level change in incidence of chlamydia/gonorrhea among adolescent girls and young women after expanded access to LARCs in Ontario and compare to that in British Columbia (where no change in access occurred). Methods: We obtained data on monthly lab-confirmed chlamydia and gonorrhea cases among people under 25 from January 2016 to December 2021 from two provincial public health agencies. Since data on individual-level LARC use is not reliably captured in Canada, we used a policy that expanded LARC access at the population level in Ontario as a proxy for LARC use. This created an opportunity to estimate the population-level impact of expanded LARC access on chlamydia/gonorrhea incidence using difference-in-differences. Results: 180,113 cases of chlamydia and 20,956 cases of gonorrhea were observed between January 2016 and December 2021 in Ontario and British Columbia. Preliminary results suggest the incidence rate ratio (IRR) for total gonorrhea cases for individuals under 25 was 1.24 (95% CI 1.07, 1.43), suggesting that expanded LARC access may be associated with increased gonorrhea rates at the population-level (an absolute increase of 31 cases post-policy). The IRR for total chlamydia cases was 1.06 (0.92, 1.22), translating to an absolute increase of 67 cases attributable to expanded LARC access. Sex-stratified analyses are underway. Conclusion: Given increased LARC access/use and STBBI incidence among people under 25, it is essential to understand if the two are linked. We found that expanded LARC access may be associated with increases in gonorrhea incidence.

Nichole Austin

Evaluating the impact of Nova Scotia's shifting coverage for assisted reproduction

Background: Assisted reproductive technologies (ART) like in-vitro fertilization (IVF) dramatically increase the probability of conception. However, ART access is not guaranteed under the Canada Health Act; coverage decisions are left to the provinces, resulting in a complex patchwork of policies across Canada. Nova Scotia introduced partial coverage for ART (a tax credit for up to 40% of eligible treatment costs) in March 2022, but little is currently known about how this type of partial, reimbursement-based coverage – the dominant coverage model in Canada – influences demand for ART. Objective: Evaluate if the introduction of ART coverage impacted overall demand for treatment. Methods: We obtained clinic-level data on new patients and new referrals (including self referrals) from January 2020 to April 2023. Descriptive statistics and trends over time were used to summarize patient referral/self-referral data. An interrupted time series (ITS) analysis was used to assess the impact of the 2022 ART coverage policy shift on referrals and new patients in treatment. Results: Before the tax credit program (January 2020 to February 2022), there were 1220 new patients in treatment (averaging 47 new patients per month). After the tax credit program was implemented (March 2022 to April 2023), there was 855 new patients in treatment (averaging 66 patients per month). Post-intervention, there was a non-significant increase of 2.8 new patients in treatment per month. The average number of referrals pre-intervention was 178 per month, increasing to 251 per month post intervention. There was a non-significant post-intervention increase of 2.6 referrals per month. Conclusion: Partial coverage for ART was associated with a modest but non-significant increase in referrals and new patients in treatment in Nova Scotia. More information is required on the impact of this type of coverage in other provinces to better understand whether partial coverage mitigates financial access barriers to care.

Nichole Austin

The impact of the Canadian emergency response benefit during the COVID-19 pandemic on the prevalence of household food insecurity in Canada

Background Government interventions targeting poverty and subsequently potentially influencing food insecurity (FI) which is a measure of consumption poverty through the form of income supplementation programs. At the beginning of the COVID-19 pandemic, a novel program known as the Canada Emergency Response Benefit (CERB) was introduced to mitigate the negative economic consequences caused by sudden mass unemployment. To date, no study has examined how CERB was associated with the prevalence of FI. Objectives To determine if the introduction of CERB reduced the prevalence of FI in Canada using a difference-in-differences (DID) analysis of Canadian Income Survey (CIS) data, and subgroups of interest: female-led lone parent households and households living in poverty. Methods This analysis used CIS cycles 2018-2020 linked to CERB receipt data (weighted n=27,535,068). FI was defined in two ways: “general food insecurity,” grouping together any severity of FI, and “advanced food insecurity,” grouping together moderate and severe FI. A DID analysis estimated the association between CERB receipt and the log odds of reported FI (general and advanced) pre- and post-intervention. This analysis was repeated in the subgroups of interest. Results Pre-intervention levels of FI were maintained in CERB-recipient households while FI decreased in non-CERB recipients. CERB receipt in the full analytical sample modified the relationship with FI between CERB and non-CERB households (DID term general food insecurity 0.145, p= 0.034; advanced food insecurity 0.251, p=0.002). Households who would go on to receive CERB had a higher predicted probability of being food insecure than non-CERB receivers at baseline. Conclusion This study shows that despite mass unemployment in the first few months of 2020, there were no increases in FI among unemployed CERB recipient households. It also highlights that those most likely to go on to lose their jobs were the most food insecure prior to the pandemic.

Laura Jimenez, Dalhousie University, Masters Student

Associations between the caregiver tax credits and caregiver well-being: a population-based cross-sectional study

Background. Caregiving expenses are negatively associated with caregiver wellbeing. Caregiving tax credits are designed to alleviate some of this burden. However, no studies have examined whether such tax credits are associated with caregivers’ wellbeing. Objectives. To examine the association between caregiving tax credits and caregiver wellbeing. Methods. We used the 2018 General Social Survey Caregiving and Care Receiving, a cross-sectional nationally representative survey focused on caregivers aged 15 years and older. Outcome variables included self-rated mental health, coping with caregiving, and caregiving hardships. Covariates included variables describing caregiving intensity and characteristics of the caregiver and caregiving recipient. The sample consists of 7,386 caregivers asked the questions on caregiving tax credits and had available data on covariates. We used logistic regression to examine the association between the receipt of the caregiving tax credit and covariates, and the association between the receipt of the caregiving tax credit and each outcome. Results. We found that individuals with a household income<$20,000 are less likely to receive the caregiver tax credit (OR = 0.34; 95%CI: 0.17-0.70). We also found that individuals with greater caregiving intensity were more likely to receive the tax credit (expenses: OR = 2.19 per 1 point increase; 95%CI: 1.80-2.65; 30+ hours per week caregiving: OR = 1.53; 95%CI: 1.13-2.08). The receipt of the tax credit was associated with lower levels of not coping well with caregiving (OR = 0.70; 95%CI: 0.49-0.98). We failed to find any associations between caregiver tax credit receipt and self-rated mental health or caregiving hardships (p>0.05). Conclusion. We find that individuals with low incomes are less likely to receive the caregiver tax credit, with analyses suggesting only modest benefits of the tax credit on the caregiver’s wellbeing. Converting the caregiver tax credit from non-refundable to refundable and increasing its value may address these findings.

Michael Lebenbaum

Clustering Phenotypes Based on FMI and ASMI Using Unsupervised Learning Methods

Introduction: Dual-energy X-ray absorptiometry (DXA) distinguishes between fat and lean mass, enabling the calculation of Fat Mass Index (FMI) and Appendicular Skeletal Mass Index (ASMI). This study employed unsupervised machine learning techniques to identify body composition phenotypes based on FMI and ASMI and evaluated their associations with cardiometabolic risks. We compared hierarchical and k-means clustering to the established classification method which uses median-based cutoffs to group individuals into one of four phenotypes based on being above or below the FMI and ASMI 50th percentile of their age and sex. Methods: Data from NHANES (a representative sample of the general US population) was used (1999-2006, n = 5,566; split into 70% training, 30% testing). All analyses were conducted separately for males and females and incorporated survey weighting and the complex sampling design. Hierarchical clustering methods (average linkage), and k-means were applied, with the optimal number of clusters determined by the elbow method, dendrogram analysis, and silhouette plots. Logistic regression models assessed associations between phenotypes using these three methods (hierarchical, k-means, and median split) with cardiometabolic risks (e.g., abnormal cholesterol, glucose). Predictive performance was evaluated using area under the curve (AUC) of Receiver Operating Characteristic (ROC) curves. Results: In this sample (47.59% male, mean age 44.85 ± 19.73 years), the median split approach had ROC-AUC ranging from 0.56-0.66. Hierarchical clustering (k=5) had lower ROC-AUC values of 0.47 to 0.52, while the k-means clustering (k=4) yielded higher ROC-AUC ranging from 0.57 to 0.67. Nevertheless, no clustering approach demonstrated a substantial advantage over the median split ($p>0.05$ across all models). Discussion and Conclusion: While body composition plays a role in health outcomes, it may not be a strong standalone predictor. Future research should integrate additional metabolic, lifestyle, and genetic factors to enhance predictive accuracy.

Alma Almidany, Unique Tutoring, Mathematics Tutor

Risk prediction models to inform treatment decisions in multivessel coronary artery disease

Background: Coronary artery disease (CAD) is a leading cause of death and disability in Canada. Coronary artery pass graft and percutaneous coronary intervention are known to be associated with better long-term outcomes than optimal medical therapy in multivessel CAD (mCAD). However, there is uncertainty regarding optimal treatment strategy for mCAD, especially in the elderly, those with more than one comorbid condition, and those at higher risk of procedural complications (e.g., excessive bleeding, kidney failure). Objectives: This study aimed to predict the risk of 1- and 5-year mortality and major adverse cardiac event (MACE) post-coronary angiogram in patients with mCAD. Methods: Data were from the Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease registry and stratified by diagnosis: ST-elevation myocardial infarction (MI) (STEMI), non-ST-elevation acute coronary syndrome (NSTE-ACS), and stable angina (SA). Cox proportional hazards regression was used to train and internally validate the prediction of mortality and MACE risks. Model performance was assessed using Harrell's C-statistic, calibration plot, Brier score, and decision curve analysis (DCA). Results: Of the 37,851 patients included in the analyses, 30280(80.0%) were male and 29524(78%) had two or more comorbid conditions. The C-statistics for models predicting 1-year and 5-year mortality risks ranged between 0.70 and 0.78, and between 0.73 and 0.79, respectively, across strata. The C-statistics for models predicting risks of 1-year and 5-year MACE ranged between 0.61 and 0.71, and between 0.64 and 0.66, respectively, across strata. Calibration plots indicated excellent calibration of risk estimates and DCA showed net-benefit of the models over "treat all" or "treat none" approaches. Conclusions: Mortality risk prediction models outperformed MACE risk models. Both models exhibited predictive performance comparable to other validated algorithms. If this holds with external validation, these models could inform the estimation of net-benefit information associated with treatment strategy for aiding decision-making for mCAD patients.

Timofei Biziaev

Machine Learning in Psychiatry: A Systematic Review of Genetic and Environmental Determinants of Mood Disorders

Background: Machine learning (ML) has emerged as a transformative tool in psychiatric research, enabling insights into the genetic and socio-environmental factors contributing to mood disorders such as major depressive disorder (MDD) and bipolar disorder (BD). This systematic review synthesizes evidence on the use of ML in studying these conditions, with a focus on genomics, epigenomics, transcriptomics, and socio-environmental determinants. Methods: A comprehensive search identified studies meeting predefined inclusion criteria: research focusing on individuals with MDD or BD and employing ML techniques to analyze genetic data and/or socio-environmental factors. Studies were excluded if they focused on brain imaging, social media data, or wearable devices. Data on study characteristics, ML methodologies, and key outcomes were extracted. The systematic review adhered to PRISMA guidelines. Results: A total of 48 studies were included, employing diverse ML methodologies across a wide range of datasets. Of these, 26 studies analyzed genetic datasets, leveraging ML techniques such as neural networks, elastic net regularization, and support vector machines to identify biomarkers and disease patterns. Transcriptomic studies highlighted alterations in gene expression linked to chronic stress and psychiatric conditions. Thirty-three studies incorporated socio-environmental factors, such as age, sex, education, and major life stressors, showcasing the predictive power of ML in identifying high-risk populations. Notably, supervised learning models achieved high accuracy in predicting mood disorder trajectories, while studies integrating genetic and environmental data demonstrated enhanced performance. Finally, 22 studies analysed both genetic datasets and socio-environmental factors. Conclusions: ML offers significant promise in unraveling the complex interplay of genetic and socio-environmental factors in mood disorders. While results are encouraging, heterogeneity in methodologies, datasets, and validation approaches underscores the need for standardized practices and large-scale studies. Future research should prioritize multimodal data integration and ethical considerations in predictive psychiatry.

Scott Campbell, Applied Pharmaceutical Innovation

Incorporating longitudinal variability in prediction: Machine Learning vs. logistic regression

Purpose: Clinical prediction models benefit from longitudinal data. While the predictive value of a predictor's mean and change over time is well-established, the role of variability around this change is underexplored. Machine Learning methods can be effective in analyzing longitudinal data with long follow-up periods. This study evaluated the predictive value of mean, change, and variability, comparing Random Forest, Lasso regression, and logistic regression. Methods: We compared models including only mean and change to models also incorporating variability. Predictor selection, interpretability, and performance were compared across methods. Performance was assessed using AUC, sensitivity, specificity, PPV, NPV, and calibration. Data were drawn from the Longitudinal Aging Study Amsterdam to predict depression using 81 longitudinal parameters. Models were trained on 70% and validated on 30% of the data. To ensure robustness, analyses were repeated over 500 random splits, and aggregated results were reported. Results: Including variability improved AUCs for all methods. Predictor selection overlapped across models, and regression coefficients aligned with Random Forest partial dependence plots. Lasso showed the highest training AUC but poorer test performance, while logistic regression and Random Forest showed more stable results. Calibration was acceptable, though predicted risks remained below 0.6. Conclusion: Machine Learning methods did not outperform logistic regression. Nonetheless, incorporating variability in longitudinal predictors enhances prediction, especially with expected changes in predictors, e.g., ageing populations.

Liza de Groot, Amsterdam UMC

Benchmarking Large language models in oral lesion diagnosis

Background: Dentistry is witnessing a swift adoption of AI solutions from diagnosis to treatment areas. Among these, large language models (LLMs) have gained popularity however, issues are associated with their accuracy, reliability, transparency, and explain-ability which is concerning especially in areas like oral lesion diagnosis. Therefore, benchmarking them prior to clinical use is vital. Objectives: To create a benchmark dataset to evaluate LLMs for oral lesion classification. Methods: Clinical charts from an oral pathology clinic were reviewed and compared to existing literature for their epidemiological patterns by an oral pathologist. Common lesions were selected namely: Angular cheilitis, Aphthous ulcer, Fibroma, Geographic tongue, Leukoplakia, Lichen Planus, Melanotic Macule, Nicotine stomatitis, Pemphigus and Pemphigoid, Verrucous carcinoma, Mucocele and Oral squamous cell carcinoma. Each case was an amalgamation of the institutional cases, previous experience, and text-book knowledge of the oral pathologist. Therefore, 120 cases were created with 10 instances per ground truth. The dataset evaluated full and quantised LLMs (Biomistral, Mistral, DeepSeek and Med42). DeepSeek and Med42 were prompted to justify their classification. Model performances were measured using metrics like accuracy, precision, recall, F1 score, AUROC and Brier score. Result: DeepSeek (quantized) showed an accuracy of 18% while Med42(full) showed 70% accuracy. The precision was highest (0.78) in Med42 (full) while reasoning, and lowest (0.18) for DeepSeek (quantized). Med42 (full) showed highest recall and F1 score of 0.7. The AUROC score was the highest for Med42 during reasoning and lowest for DeepSeek (quantized). DeepSeek (full) had the lowest Brier score of 24.20 while the quantized version had 73.68. Conclusion: In the era of generative AI, the presence of clinical chart benchmark datasets for evaluating models for oral lesion classification is rare. Through this openly accessible dataset and its subsequent versions, we aim to increase trustworthiness and reliability of LLMs in oral lesion diagnosis.

Zaneta D'Souza

Examining the Relationship Between Oral and Cardiovascular Age Using Deep Learning

Background: Aging is a complex, multifactorial process that affects each organ system differently. While age is a known risk factor for major chronic disease and mortality, chronological age alone does not capture system-specific decline. Organ-specific aging models can offer insights into their health and risk profiles. Although strong evidence supports the links between oral health and cardiovascular (CV) health, the distinct aging trajectories of oral and CV system remain understudied. Therefore, this study aims to address this gap by examining the relationship between oral and cardiovascular age profiles. Objectives: (1) To compare the predictive performance of machine learning models in estimating oral and cardiovascular age using respective clinical health measures; (2) To examine the relationship between oral and cardiovascular age acceleration. Methods: We utilized data from NHANES 1999–2002 (n: 15,958, age: 10-85 years) to train machine learning models (MLP, RF, SVR, XGBoost) to predict age from relevant clinical health measures. Data was split into train/test:0.8/0.2 and model performance was evaluated using mean absolute error (MAE), root mean square error (RMSE) and Pearson correlation coefficient (R). Predictions were compared with HorvathAge (estimate for whole body age). Age gaps were calculated as the difference between predicted and chronological age. Linear regression was used to assess the relationship between oral and CV age gaps, adjusting for sex. Results: XGBoost outperformed other models for both oral (R^2: 0.74, MAE: 8.8) and CV age prediction (R^2 = 0.51, MAE = 13.9), while HorvathAge showed R^2 of 0.62 and MAE of 4.6. Adjusted regression analysis showed that for each one-year increase in oral age gap, the CV age gap increased by 0.77 years (95% CI: 0.72–0.81, R^2: 0.32). Conclusion: Our findings support the utility of machine learning for building interpretable, organ-specific aging clocks using routine clinical measures. Oral and CV age profiles showed significant association, reinforcing the systemic link between oral and CV health. Future work will validate these findings using CLSA dataset, explore additional biomarkers, and expand the aging profiles to include other organ systems.

Harsimran Singh Kapoor, PhD Trainee, McGill University

Tracking Lyme Disease Through Tweets: A Deep Learning Approach

Background Traditional Lyme disease surveillance often struggles with underreporting and delayed diagnosis. With more people sharing health concerns on social media, platforms like Twitter can offer new ways to detect early signs of illness across large populations and regions. Objective This study aimed to test how well transformer-based (BERT) natural language processing models can detect potential Lyme disease cases in tweets and whether adding sentiment information from emojis could help improve the results. Methods We built a dataset of 20,000 English tweets about Lyme disease, collected globally between 2010 and 2022. Each tweet was manually labeled as related or not to a possible Lyme case using keywords from both clinical language and everyday expressions. Three transformer-based models—BERTweet, DistilBERT, and ALBERT—were trained and compared. Emojis were translated into sentiment words and added to the text to see if they improved classification. We assessed the models using standard metrics, including accuracy, precision, recall, and F1-score. Results BERTweet achieved the highest classification accuracy (90.0%), precision (97.1%), and F1-score (89.3%). DistilBERT and ALBERT also performed well, with F1-scores of 88.2% and 87.3%, respectively. Adding emoji-based sentiment increased recall by 8% for BERTweet and improved overall performance for all models. The tweets classified as potential cases came mainly from the United States (49.1%), the United Kingdom, Canada, and Australia. The most reported symptoms were rash, fatigue, fever, and arthritis, matching known clinical profiles. Conclusion This work shows that transformer-based models, especially when combined with emoji sentiment, can help identify Lyme-related discussions on Twitter. This approach could support public health surveillance by capturing cases that may not be reported through traditional systems, especially in regions where awareness or access to care is limited.

Elda Laïson, Université De Montréal

Visualization Is All You Need: Robust Approach for Dimensionality Reduction in Genetics and Genealogy

Background:High-dimensional biological data in genetics and genealogy are extremely sparse and noisy, with >99% zeros, hindering faithful structure recovery. Conventional dimensionality-reduction (DR) techniques often struggle to capture underlying structures. Motivation: We aim to develop a novel unsupervised DR method that yields more faithful low-dimensional representations of complex biological and genealogical data in order to uncover hidden structure which preserve true biological structure more robustly. Methods: We introduce CosMAP, an unsupervised DR approach that extends UMAP by combining a cosine-similarity–based robust affinity with a normalized-temperature cross-entropy normalization. CosMAP is designed to preserve intrinsic neighborhood structure while resisting noise and outliers such as cell doublets and apoptotic cells. We also incorporate the Pairwise Controlled Manifold Approximation (PaCMAP) sampling scheme to further enhance visual clarity and clustering performance. Results: We evaluate CosMAP on real single-cell RNA-seq datasets such as cortex, PBMC, heart cell atlas and retina. Compared with UMAP, PaCMAP and LocalMAP, CosMAP improves neighborhood preservation and global interpretability, yielding cleaner separation of biologically meaningful groups and more faithful manifold geometry in sparse regimes. Quantitatively, CosMAP achieves higher clustering quality by Silhouette score, Normalized Mutual Information (NMI), and Adjusted Rand Index (ARI), consistently outperforming state-of-the-art baselines. Limitations: Performance of CosMAP may depend on hyperparameters k in the nearest-neighbour and the values of the temperature. Conclusion: CosMAP reliably uncovers latent structure in sparse, noisy datasets, supporting downstream tasks such as biomarker discovery and detection of disease-relevant patterns. These improvements have potential to accelerate the development of diagnostics and treatments in complex diseases, including cancer, while providing clearer, more trustworthy visualizations for exploratory analysis of genetic and genealogical data. Code and parameters will be released for reproducibility.

Fenosoa Randrianjatovo, INRS, Student

Development of automated crosswalks for the International Classification of Diseases coding system using natural language processing

Background: Crosswalks are required to measure comorbidity for longitudinal studies relying on more than one International Classification of Diseases (ICD) version. Automated crosswalks based on natural language processing (NLP) could facilitate finding equivalent ICD codes across different versions. The performance of NLP methods depends on the NLP tasks. Objective: To compare two NLP methods and to develop an automated crosswalk from the ICD-10-CA (Canadian Adaptation) to ICD-9-CM (Clinical Modification) for ICD codes in the Charlson comorbidity index (CCI). Methods: Two transformer-based NLP models, BioFormer and SBERT, were used to produce sentence embeddings for ICD-10-CA code labels in the CCI (n=942) and for all ICD-9-CM code labels (n=15,145). Cosine similarity scores (CSS), a measure of similarity, calculated for all pairs of ICD-10-CA and ICD-9-CM code labels, were used to define automated crosswalks as equivalent (CSS = 1), high (0.8 ≤ CSS < 1), and moderate-to-low (CSS < 0.8). Crosswalk accuracy was evaluated using a reference standard crosswalk created by the Canadian Institute for Health Information. To evaluate the performance, BioFormer-based automated crosswalk was applied to ICD-9-CM and ICD-10-CA hospital abstracts in 2003/2004 and 2005/2006, respectively, as ICD-10-CA data started on April 1, 2004. Results: For ICD-10-CA codes in CCI, 9% were classified as equivalent for both models, 60% were high for BioFormer, whereas 31% were high for the SBERT. The automated crosswalk produced similar prevalence of selected Charlson comorbidities (e.g., mild liver disease: 1.4% for ICD-10-CA, 1.6% for ICD-9-CM), but most of the comorbidities (e.g., congestive heart failure: 27.2% for ICD-10-CA, 40.1% for ICD-9-CM) differed between two versions. Conclusion: Compared to SBERT, BioFormer had higher accuracy for identifying semantically similar diagnosis code labels for ICD-10-CA and ICD-9-CM. These findings will advance healthcare research involving two or more ICD versions. Model fine-tuning on domain-specific data could improve the accuracy of the crosswalk.

Joykrishna Sarkar, University of Manitoba, Student

Characteristics of Medical Encounters in the Canadian Armed Forces: Insights from Epidemiologic Surveillance

Introduction: The electronic medical record (EMR) system used by the Canadian Armed Forces (CAF) contains valuable information for population health surveillance. Surveillance on the number of medical encounters has been initiated to better understand healthcare seeking trends of CAF personnel. Objective: The objective of this study was to describe the frequency of medical encounters by demographic and military occupational characteristics. Methods: This study combined administrative and EMR data to describe medical encounters from January 1 to December 31, 2024. Reasons for medical encounters were categorized by ICD-10 chapters. Poisson regression was used to estimate rates of medical encounters adjusted for age, sex, chronic conditions, military rank and command. Results: Overall, 79,277 personnel (17% female) accessed healthcare during the study period, totaling 354,672 encounters (mean 4.5, SD5.0) and an average of 0.89 (SD0.25) person-years. Over two-thirds (70%) were under 40 years, and 36% had at least one chronic health condition. The main reasons for visits were for factors influencing health status/contact with health services (Ch21, 40%), mental and behavioural disorders (Ch5, 20%), and musculoskeletal injuries (Ch13,15%). Female sex (RR 1.42, 95% CI 1.41-1.43), decreasing rank (RR 1.43, 95% CI 1.41-1.45, for junior non-commissioned members vs, senior officers), older age (RR 1.31, 95% CI 1.29-1.32, for <30 vs. 50+ age groups) and a history of a chronic condition (RR 2.01, 95% CI 2.00-2.03) were associated with higher visits. These factors were also associated with visits for mental health disorders and musculoskeletal injuries. Conclusion: The most utilized diagnoses were for administrative visits, injury, and mental health, with distinct trends by sex, age, and military rank. These findings have the potential to inform health planning and public health action.

Chrissi Galanakis

Age and Sex Disparities In Multimorbidity Among Ontarians Living With Asthma

Background: Multimorbidity, the co-occurrence of two or more chronic conditions, is a rising global problem with significant implications for population health and health systems. It is associated with complex care plans, poorer health outcomes, and excess mortality. Asthma is the third most common chronic disease in Canada, yet there is a lack of studies investigating the burden of multimorbidity in this population beyond allergic and respiratory diseases. Objective: To describe the prevalence of multimorbidity in adults with asthma in Ontario by age and sex. Methods: We conducted a population-based cross-sectional study of adults 18 years or older with prevalent asthma in 2022 using health administrative data from Ontario, Canada. We calculated the prevalence of multimorbidity defined as having one or more of 16 chronic conditions in addition to asthma. We compared prevalence by age groups and sex, and identified the top five chronic conditions for each sex. Results: Of 1,914,729 adults with asthma, 79.4% (95% confidence interval [CI] 79.4 – 79.5%) had two or more (2+) conditions and 57.1% (95% CI 57.0 – 57.2%) had three or more (3+) conditions. Females had a higher prevalence of multimorbidity than males (84.1% versus 73.8% for 2+ and 64.1% versus 48.8% for 3+ conditions). Prevalence increased with age, 65.9%, 91.5% and 98.1% for 2+ conditions among 18-44years, 45-64years and 65years or older respectively. The top five conditions among females were mood and anxiety disorders, osteoarthritis, cancer, other mental illnesses, and hypertension while the top five conditions among males were mood and anxiety disorders, osteoarthritis, other mental illnesses, hypertension and cancer. Conclusion: The prevalence of multimorbidity in adults with asthma is very high across all ages and females are disproportionately affected. These findings provide evidence to guide health system planning, resource allocation and development of integrated models of care for individuals with asthma.

Ijeoma Itanyi, University of Toronto, Doctoral Reseacher

The natural course of sleep quality from age 24 to 35

Background: Healthy sleep is characterized by adequate sleep duration, good quality sleep, high sleep efficiency and age-appropriate bedtimes and wake times. However, few studies consider all these components longitudinally in young adults. Objectives: To describe: (i) eight sleep indicators (Pittsburgh Sleep Quality Index (PSQI), self-report sleep quality, sleep duration, sleep latency, sleep efficiency, sleep disturbances, use of sleep medication, daytime dysfunction); and (ii) individual change in sleep quality and duration from age 24 to 35. Methods: Data were drawn from an ongoing longitudinal study which recruited 1294 high school students in Montreal in 1999-2000. The current analyses (n=554) used data collected over 11 years at ages 24, 31, 34, 35. Sleep indicators were measured with the PSQI (range 0-21; poor sleep quality >5). Individual change was examined by computing differences in PSQI scores and in sleep duration from age 24 to 35. Also, we computed the proportion of participants maintaining poor or good sleep quality at ages 24, 31 and 35. Results: Most sleep indicators remained constant over 11 years. Sleep disturbances which increased over time included waking up in the night (36% to 55%), using the bathroom (27% to 46%), coughing/snoring (8% to 18%), feeling too hot (23% to 32%) and having pain (5% to 18%). Using sleep medication increased from 8% to 14%. The mean (SD) individual change in PSQI scores was -0.59(3.55), and in sleep duration was 0.29(1.49) hours. 29% of participants maintained good sleep quality and 16% consistently experienced poor sleep quality. Conclusion: PSQI scores increased from age 24 to 35, suggesting worse sleep quality over time possibly due to more sleep disturbances. Use of sleep medication increased. Few participants maintained consistent good or poor sleep quality. Further research should characterise these individuals.

Mounia Naja + 1 more

From Observation to Insight: Do Sunscreen Dispensers Shift Sun Safety Behaviours in Toronto?

Background: Skin cancer is a growing public health concern, with ultraviolet (UV) radiation exposure being a primary risk factor. Sunscreen is a highly effective sun protection measure encouraged alongside other measures (e.g. clothing, hats, sunglasses, and shade), but its use is often hindered by cost, inconvenience, forgetfulness, and discomfort. Objectives: This study evaluates the relationship between public sunscreen dispenser availability and sun safety behaviours, including sunscreen use, clothing choices, and shade-seeking tendencies, among visitors to Toronto's waterfront parks. Methods: A cross-sectional, naturalistic observational study was conducted at 25 sunscreen dispensers across Toronto from July to September 2024. Observations were conducted during peak UV hours, recording user demographics, dispenser characteristics, sunscreen application, and other sun-protective behaviours. Sun safety behaviours were compared between dispenser areas and control zones (>250m away). A sun safety score was computed by assigning points for sun-protective behaviours, with higher scores indicating greater sun protection. Statistical analyses included descriptive statistics and outcomes were evaluated with regressions for behavioural comparisons and to assess predictors of sun safety scores. Results: A total of 140 individuals were observed using sunscreen dispensers, with usage higher among women (71%) and adults (54%). Sunscreen was most frequently applied to arms (97.9%), while face application was less common (15.0%). However, males engaged in increased sun-protective behaviours. Demographic differences were observed, with teens and children engaging in fewer sun-protective behaviours than adults. Individuals alone had significantly lower sun safety scores compared to those in groups. Higher UV index and temperature were associated with increased sunscreen use, while beach locations had significantly lower sun safety scores than parks. Conclusion: Public sunscreen dispensers was not associated with enhancing sun safety behaviours in their vicinity. Sociodemographic and environmental factors were strong predictors of protective behaviour, with children and teens consistently showing lower adherence. These findings underscore importance of age-specific and context-sensitive interventions to improve sun safety.

Anojini Ravichandran, Ontario Health, Research Assistant

Hypertension Prevalence in sub-Saharan Africa: A systematic review and meta-analysis with GLMM

Background: Hypertension is a key risk factor for non-communicable diseases, including cardiovascular diseases and stroke. Its prevalence increases with age. This study conducted a systematic review and meta-analysis (PROSPERO registration: CRD42023452024) to estimate the prevalence of hypertension in persons ≥ 15 years old in sub-Saharan Africa. Methods: Literature was searched in six databases (Embase, CINAHL, MEDLINE Ovid, Scopus, Web of Science, and Cochrane Library). Grey literature was also searched for unpublished studies. Nationwide population-based studies published between 2000 and 2024 reporting the prevalence of hypertension were included in the review. Data extraction and quality assessment were conducted in duplicate. Results: We screened 6383 studies and retrieved 109 full-text studies to evaluate for inclusion in the review. We analyzed forty-five (45) studies, with one study providing two data points. These studies provided information on 958,957 individuals in 20 African countries with a median age of 40.7(IQR 37-51). The studies predominantly assessed the associated risk factors and prevalence of hypertension. The overall prevalence estimates of hypertension stood at 27% (95% CI: 23%, 32%) in the meta-analysis and remained the same when leave-one-out and GLMM analysis was conducted. Males had a higher prevalence of hypertension at 32% (95% CI:27%, 39%) compared to females at 30% (95% CI:24%, 37%). Significant heterogeneity was observed across studies, with an I2 statistic of 99.92%. The observed heterogeneity was explained by differences in BMI categories (Overweight/obese), sex, mean age, and smoking status ($p<0.05$). Conclusion: These findings can inform longitudinal studies that will help formulate public health policies targeted at early hypertension screening and treatment, reducing related deaths in sub-Saharan Africa.

Nana Ama Tiwaa-Boateng, Effect Hope, Programs Officer

Beyond The Numbers: Expanding The Core Competencies of Public Health Research Graduate Programs

BACKGROUND: Advancements in epidemiologic and biostatistical methods have been fundamental to improvements in public health practices. With shifts in societal health burdens, the core methodologic competencies for trainees are rapidly expanding beyond quantitative approaches. As such, graduate curriculum should grow in parallel to encompass this advancement. OBJECTIVES: (1) To cross-sectionally describe the research methods used in high impact public health journals and, (2) review the curriculum offered by public health graduate programs at Canadian institutions. METHODS: We reviewed primary research articles that were published in November 2024 across 12 public health journals and extracted information on study type (qualitative, quantitative or mixed methods) and other key characteristics. This was compared to a cross-sectional description of study designs published in 2022. We examined graduate thesis-based programs in epidemiology, public health, and related disciplines across 111 Canadian universities. Program names, departments, and the availability of qualitative methodology courses were extracted. RESULTS: Among the 12 journals, 67 articles were reviewed: 52 (77.6%) were quantitative studies, 14 (20.9%) were qualitative, and 1 (1.5%) was mixed methods, indicating a growing presence of qualitative approaches (compared to the 2022 report of 85%, 4%, and 11%, respectively). Of 111 institutions, 30 offered thesis-based graduate programs in public health or epidemiology. Among these, 25 (83.3%) provided qualitative research methodology courses for at least one of their programs, with 11 (36%) as mandatory and the remainder as electives. Across Canada, mandatory qualitative training was required in at least one program in institutions from British Columbia, Alberta, Ontario, Quebec, and Newfoundland and Labrador. CONCLUSION: The demands of public health research are evolving, and Canadian graduate programs must incorporate comprehensive training that includes qualitative research methods. Gaining insight into the "how" and "why" of health disparities and intervention effectiveness requires methodological approaches that account for context, lived experiences, and implementation challenges.

Cindy Wen, Queen’s University, MD/PhD Candidate + 1 more

Association Between Sociodemographic Factors and Acute Gastrointestinal Illness in a Canadian Linked Cohort

Introduction: Acute gastrointestinal illness (AGI) remains a significant public health issue and the risk of contracting it based on sociodemographic characteristics remains poorly defined. Purpose: T o identify the risk of contracting AGI based on various sociodemographic factors. Methods: Canadian Community Health Survey respondents were followed from time of interview, to December 31, 2017, using the National Ambulatory Care Reporting System (NACRS) to capture emergency department (ED) visits and the Discharge Abstract Database (DAD) to capture hospitalizations due to AGI. A series of sociodemographic and health indicators were selected for assessment based on prior literature. Associations were assessed using Cox proportional hazards regression to estimate hazard ratios (HRs). Results: 470,700 respondents were linked to the DAD and 190,700 were linked to the NACRS. Six percent (n = 10800) of respondents incurred ED-treated AGI visits and 2% (n = 9400) were hospitalized. Associations included being a male gender, young adults or seniors, having less than a secondary school education, low income, being a racial minority, being an immigrant to Canada, living alone, men who have sex with men (MSM), being under or overweight, cigarette smokers, alcohol drinkers, having a chronic condition, poor perceived health, and being compliant with national recommendations for produce consumption. of note, in unadjusted models MSM had a 3% risk of requiring an ED visit (HR 1.03 95% CI 0.97-1.10) and a 136% increased risk of requiring a hospitalization (HR 2.36 95% CI 2.23-2.49), and people with poor perceived health had an 81% increased risk of requiring an ED visit (HR 1.81 95% CI 1.73-1.89) and a 209% increased risk of requiring a hospitalization (HR 3.09 95% CI 2.96-3.22). Significance: This study identified novel risk factors for requiring a hospital-based visit for AGI, which can be used to inform public health proGramming.

Anthony Gilding, Toronto Metropolitan University

Change over time in children's health disorders in two provinces in Canada: A multi-level mixed model analysis

Background: The prevalence of childhood health disorders varies across Canada. Comparisons of prevalence rates provides opportunities to further examine current and ideal systems, policies, and resource planning for early identification and intervention services. Objective: The objective was to compare change over time in prevalence of 1) special needs status, 2) neurodevelopmental disorders, and 3) developmental vulnerability of kindergarten children residing in Ontario and Manitoba between 2010 and 2019. Methods: We utilized a multi-level modeling approach to growth curve analyses. We used multiple waves of population-level, observational, cross-sectional panel data collected with the Early Development Instrument. The analytic dataset (N=452,031) was aggregated by neighbourhood codes and measurement occasion to obtain the mean values of each variable. Mixed effect predictors were sex, age, English/French language learner status, presence of functional impairments, and socioeconomic status. Results: Grand mean prevalence in Ontario for each outcome was 4.5%, 2.6%, and 27.9%, respectively. Grand mean prevalence in Manitoba for each outcome was 3.8%, 2.5%, and 31.7%, respectively. Linear growth models show the predicted prevalence of each outcome in Ontario at the initial timepoints were 3.8%, 2.1%, and 26.7%, and expected to increase by 0.2-0.6% for each subsequent timepoint. Similarly in Manitoba, prevalence estimates were 3.2%, 2.1%, and 30.8%, and expected to increase by 0.2-0.3% for each subsequent timepoint. When covariates were added, prevalence estimates increased in neighbourhoods with greater proportions of impairments ($p<0.001$) and English/French language learner status ($p<0.001$-0.37). Prevalence estimates decreased in neighbourhoods with higher socioeconomic status ($p<0.001$-0.99) and greater proportions of females ($p<0.001$-0.21). Conclusions: We demonstrated a consistent change over time in prevalence of special needs status, neurodevelopmental disorders, and developmental vulnerability in kindergarten children, which may result in increased unmet healthcare and educational needs. Policy decisions should focus on interventions that address healthy child development particularly in at-risk neighbourhoods.

Rita Jezrawi, McMaster University, MSc eHealth Research Assistant

The mediating effect of depressive symptoms on the association between religious participation and memory in middle-aged and older adults

Background: Persons who engage in religious practices often possess more resilience, positivity, strength, and hope compared to persons who do not engage in religious practices. These psychosocial factors may help explain why religious participation is associated with memory function. However, little is known about the mediating effects of depressive symptoms on this association. Objectives: We used baseline, three-year follow-up, and six-year follow-up data from the Canadian Longitudinal Study on Aging to examine whether depressive symptoms mediates the association between religious participation and memory in middle-aged and older adults. Methods: Using multilevel regression with complete cases (n = 15,141) and adjusting for sociodemographic, health, and lifestyle covariates, we obtained the effect of religious participation on depressive symptoms ('a' path) and the effect of depressive symptoms on memory while adjusting for religious participation ('b' path). We then utilized the mediation package in R v4.5.1 to obtain mediated, direct, and total effects for the association of interest. Results: Religious participation was negatively associated with depressive symptoms (β= -0.250, 95% CI [-0.442, -0.059]), which in turn was negatively associated with memory while adjusting for religious participation (β= -0.010, 95% CI [- 0.017, -0.004]). We did not find a significant direct effect between religious participation and memory (β= 0.008, 95% CI [-0.071, 0.090]), though we found evidence of weak mediation by depressive symptoms (β= 0.003, 95% CI [0.00055, 0.010]). Conclusion: Our findings suggest the possibility that depressive symptoms mediates the association between religious participation and memory. The absence of a significant direct effect is contrary to some previous research, though much of this earlier work was cross-sectional or limited to highly select sample frames. Further longitudinal research is needed to disentangle the complex relations between depressive symptoms, religious participation, and memory.

Bonita Nath, University of Waterloo, PhD Candidate

The prevalence of Canadian kindergarten children with special health needs: A pre-post COVID-19 analysis using the Early Development Instrument

Background: Special health needs (SHN) encompasses a range of disorders affecting behaviour, communication, and physical development. The COVID-19 pandemic and related disruptions to healthcare, childcare, and early education programs, may have affected the SHN of children, as many resources and supports were unavailable to them during this time. Pre-COVID-19 research has found higher rates of SHN in neighbourhoods with lower socioeconomic status (SES). It is currently unknown whether the teacher-reported prevalence of SHN in Canadian kindergarten children increased after the onset of COVID-19 pandemic, and whether neighbourhood-level SES was associated with this prevalence. Objectives: We determined the proportion of children with SHN in Canada before (2017-2020) and after (2021-2023) the onset of the COVID-19 pandemic and the association with neighbourhood-level SES. Methods: The kindergarten teachers reported SHN for their students using the Early Development Instrument (EDI). EDI records were linked with sociodemographic data from the 2016 Canadian Census and 2015 Taxfiler for 2,058 neighbourhoods for linear regression analysis. Results: Among 485,543 children, SHN prevalence in kindergarteners increased from 22.2% to 25.2% following the onset of COVID-19 (Cramer's V = .035, p<.001). Linear regression analysis revealed a higher prevalence of teacher-reported SHN in children after the onset of the COVID-19, with a larger proportion of these children residing in lower-SES neighbourhoods. Separate regressions for jurisdictions indicated the association between neighbourhood-level SES and SHN was strongest in Newfoundland & Labrador and weakest in Quebec, both pre- and post-COVID-19 onset. Conclusion: The association between rates of SHN and neighbourhood-level SES was stronger post-COVID-19-onset, indicating widening inequities in the proportion of kindergarten children with SHN. Our study also points to the urgency for additional support in the classroom for children who are showing signs of difficulty in kindergarten.

Anjelica Shrestha, McMaster University, Masters of Public Health

Heterogenous association between frailty and health care use among older adults in Canada

Background Frailty as a predictor of health care use is well-studied. However, it remains unclear whether frailty's association with health care use differs across sociodemographic groups. Using nationally representative data from Canada, this study examined heterogeneity in the association between frailty and health care use by sex, immigration status, and race. Methods We analyzed secondary data from the Public Use Microdata Files (PUMF) of the Canadian Community Health Survey (CCHS) 2013-14. A total of 70,825 respondents aged ≥ 45 were included in the study. Outcome measures included General Practitioner (GP) visits, specialist visits and inpatient admissions. A frailty index consisting of a 28-item was the primary exposure variable. Both logistic and count data regression models were employed to examine the association between frailty and health care use, adjusting for potential covariates. Results The average number of GP visits, SP visits, and inpatient admissions in the last 12 months was 2.91 (±3.69), 1.00 (±2.07), and 0.58 (±3.13), respectively. About 57% of the respondents were in the frailty group ≤0.1, followed by 27.2% in 0.11-0.20, 9.3% in 0.21-0.30, and 6% in ≥0.31. We found a positive association between frailty and health care use. However, the magnitude of association across outcomes was consistently higher among males, immigrants and non-Whites. For instance, the FI group of ≥0.31 had a stronger effect on non-Whites (IRR=10.71) for SP visits compared to Whites (IRR=6.16). Conclusion Our findings underscore the importance of considering social stratification factors in addressing healthcare needs for people across levels of frailty. There is a need for comprehensive strategies to manage frailty and enhance primary care services to mitigate higher health care costs associated with higher frailty levels.

Jalal Uddin, Dalhousie University, Research Fellow

Associations of threat and deprivation-related childhood exposures with chronic conditions among middle-aged and older Canadians: The moderating role of social support

Introduction: Although existing research demonstrates an association between childhood stressors and adult health outcomes, fewer studies have explicitly examined how different dimensions of childhood stressors (e.g., threat and deprivation) uniquely predict chronic conditions. Moreover, the role of social support in adulthood as a potential protector against the impact of early-life stressors on chronic disease has been relatively understudied. This study examines the associations between two dimensions of childhood adversity and multimorbidity and multi-domain disease conditions and assesses whether these associations vary by social support availability. Data and Methods: This is a secondary analysis of the Canadian Longitudinal Study on Aging (CLSA), using a baseline sample (2011-2015) of 38,191 participants aged 45-89. Outcomes included 30 chronic diseases, multimorbidity (≥3 conditions), and multi-domain diseases (≥3 disease domains). Key exposures include 2 types of childhood adversity (threat and deprivation). Logistic regression was used to estimate associations between adversity type and chronic disease outcomes, adjusting for sociodemographic factors. Effect modification by overall social support availability (SSA) was also assessed. Results: Overall, 37% of participants reported ≥3 chronic conditions, and approximately 25% had chronic conditions spanning ≥3 disease categories. Any threat and any deprivation show positive associations with most health multimorbidity and multi-domain chronic conditions (Table 1). Conditions like COPD (OR=1.84), bowel incontinence (OR=1.90), and memory loss (OR=1.81) exhibit the strongest associations with any threat, while their ORs for deprivation remain elevated but slightly attenuated (Fig. 1). Digestive (OR=1.57), respiratory (OR=1.42), and neurological (OR=1.41) domains show the highest vulnerability to threat exposure. Similar associations exist for deprivation exposure as well (Fig. 2). The magnitude of the association between any threat-related experience and multimorbidity outcomes is smaller at the highest levels of perceived social support (Fig. 3). Conclusions: In this national-level cohort study, childhood exposures to threat and deprivation-related experiences were associated with increased odds of chronic physical health conditions, multimorbidity, and multi-domain chronic conditions in mid-late life. Adults exposed to any threat-related experiences in childhood but with strong social support in adulthood had a lower odds of multimorbidity than those with lower levels of support.

Jalal Uddin, Dalhousie University, Research Fellow

Changes in Cannabis Dependence Levels of Ontario Youth across the COVID-19 Pandemic: A Longitudinal Cohort Study

Background: Frequent cannabis use in young adulthood is linked to adverse health outcomes, including cannabis use disorder (CUD), which impacts quality of life. During the early pandemic, individuals aged 18 to 29 were most at risk for increasing use, aligning with the age group most affected by CUD. Given the relationship between increased cannabis use and vulnerability to substance use disorders in this age group, the impact of pandemic-driven use changes on the severity of cannabis dependence over time warrants further investigation to guide public health recommendations. Objective: This project aimed to examine whether increased cannabis use during the COVID-19 pandemic is associated with changes in cannabis dependence longitudinally. Methods: Participants (n=1579; 55% female) were Canadian youth aged 16 to 30 from Ontario who reported recent cannabis use. They were recruited from an existing cohort and completed online questionnaires in 2022 and 2023. A linear regression analyzed the relationship between changes in cannabis use and shifts in Cannabis Use Disorder Identification Test-Revised (CUDIT-R) scores, controlling for sociodemographic factors. Multiple imputation was used for sensitivity analysis to address participant attrition. Results: At baseline, 58% (n=918) of participants reported increased cannabis use since March 2020, correlating with higher CUDIT-R scores compared to those with stable consumption (β: 1.49; 95% CI: 0.99, 2.00). At baseline, 146 participants (9%) did not meet the cannabis dependence threshold on the CUDIT-R (>13) but were classified as dependent at follow-up, while 26% exhibited dependence at both waves. Sensitivity analysis results were consistent with the complete case analysis. Conclusion: These findings suggest that youth who escalated their cannabis use during the COVID-19 pandemic had increased CUDIT-R scores. The increase in cannabis dependence highlights CUD as a pressing public health issue for Ontario's youth, indicating a need for targeted health campaigns and early interventions to address its adverse effects.

Jessica Berryhill, University of Ottawa, PhD Candidate

Trends in smoking and vaping frequency among Ontario high school students between 2015-2023

Background: Youth smoking and vaping continues to be a public health concern. In Ontario, while the prevalence of smoking has decreased, the prevalence of vaping rapidly increased. However, little is known about the frequency with which students smoke and vape and how it may have changed over time. Objectives: The objectives of this study were to explore 1) changes in smoking and vaping frequency over an 8-year period, 2) whether the changes differed for those who used a single vs both tobacco products, and 3) whether changes in frequency differed by sex. Methods: This study used data from a repeat cross-sectional sample of Ontario high school students attending 48 schools that participated in the COMPASS study between 2015-16 and 2023-24. The frequency of past 30-day smoking and vaping were investigated overall, as well as by sex. Results: Between 2015-2023, the proportion of youth who smoked everyday gradually decreased (30.1% in 2015-16 vs 23.7% in 2023-24). In contrast, the proportion of youth who vaped everyday increased (13.8% in 2015-16 vs 33.5% in 2023-24). Across waves, dual smokers/vapers reported higher vaping frequencies relative to those who only vaped. By 2023, 45.9% of dual smokers/vapers reported vaping everyday, compared to 27.3% of exclusive vapers. Differences in vaping frequency by sex have narrowed over time. Conclusion: The proportion of you who vape frequently has changed as the prevalence of vaping and devices have changed. Given the highly addictive nature of nicotine, policies that restrict the amount of nicotine in cigarettes and vapes could help to reduce the addictive potential. Given the rise in daily vaping among youth, evidence-based vaping cessation programs are urgently needed.

Adam Cole, Ontario Tech University, Assistant Professor

Misclassification of cannabis exposure in pregnancy: examination of differences between first-trimester self-reported use and hair THC-COOH measures

Background: Self-reported measures are often relied upon to characterize maternal cannabis use during pregnancy and as a proxy for foetal exposure. However, discordances arise in studies comparing cannabis biomarkers and self-reports. The aim of this study is to investigate discrepancies between self-reported use and hair THC-COOH measurements during the first trimester of pregnancy. Methods: Participants from the Quebec City area were recruited in the PREVENTION cohort (N=1306) at 11-14 weeks of pregnancy and completed a questionnaire documenting cannabis use since conception. A 3 cm hair segment corresponding to the first trimester was analyzed for THC-COOH. Exposure profiles were characterized by a detailed analysis of active and passive sources of exposure in the three months preceding and during pregnancy. Results: Cannabis use was reported by 4.7% (n=62) and hair THC-COOH was detected in 6.2% (n=81). However, both measures were concordant for only 3.1% (n=41). Among those reporting use but with non-detected THC-COOH concentration (1.6%; n=21), 78% reported using only once or twice in the very first weeks of pregnancy (24 days after the beginning of the last menstrual period on average). Among those that reported no use but had detected THC-COOH concentration (3.1%; n=40), all reported having ever used cannabis and 67.5% in the three months preceding the pregnancy (1.9 days/week on average). Furthermore, sources of potential passive maternal exposure were frequent in this group: 15.0% reported someone else smoked in their house and 64.7% of partners reported cannabis use during the first trimester (5.0 days/week on average). Conclusion: Self-reports of cannabis use during pregnancy alone are a poor proxy of maternal exposure due to imprecise time-period recall and indirect exposure. Hair THC-COOH identify more exposed participants than self-reported measures but may not be able to detect a few exposures that took place at the very beginning of the pregnancy.

Yohann Courtemanche, Université Laval

Social Network Mechanisms of Behavior Change in Alcohol Use Disorder Recovery: A Longitudinal Observational Cohort Study

Background: Social factors play a pivotal role in both the development of and recovery from problematic alcohol-related behaviours, and social network analysis (SNA) provides unique opportunities to better understand these influences. Objectives: Few studies have applied formal SNA to explore recovery from alcohol use disorder (AUD), which was the purpose of the current study. A secondary purpose was to examine for differential impacts of the various network features by sex. Methods: Using a longitudinal sample (N=501) of adults with AUD making a significant recovery attempt followed over 6 time points, we employed a formal SNA of the 20 closest individuals in each participant's network. Hierarchical models were used to identify how social network characteristics acted as barriers or facilitator to recovery, defined three ways: abstinence, reduced WHO drinking level, and reduced drinks per week. Models were run within a Bayesian imputation framework to address attrition and missing data. Results: Greater likelihood of abstinence was facilitated by more frequent social interaction with one's network (OR: 2.54, (95% CI: 1.16, 5.64)) and having more family members in one's network (1.18 (1.02, 1.37)). WHO level models additionally identified that greater network heavy drinking was a barrier to recovery, but only for females (0.52 (0.29, 0.95). Having greater recovery program members in one's network was a significant recovery facilitator for males only (1.52 (1.15, 2.06)). Conclusion: These findings underscore the importance of social networks, particularly the family network, in supporting recovery from AUD, as well as how heavy drinking within one's network may impede recovery for some. Findings also highlight how the social network 'transplantation' provided by recovery programs may be disproportionally beneficial for men.

Amanda Doggett, McMaster University

Factors Associated with Lower-Risk Cannabis Use in Prime Working-Age Adults

Background: Harm reduction strategies encourage cannabis users to adopt lower-risk behaviors, such as refraining from daily or intensive use or limiting simultaneous use with other psychoactive substances. However, little is known about characteristics of lower-risk users. This study compared the characteristics of lower-risk cannabis users with those of non-users and problematic users. Methods: Cross-sectional data on 731 adults (mean [SD] age 35 [0.6] years; 57.5% female) were drawn from the Nicotine Dependence in Teens study, collected in 2022–23. Problematic cannabis use was assessed using the Cannabis Abuse Screening Test (CAST). Sociodemographic, mental health, and lifestyle factors, as well as patterns of cannabis use, were compared across non-users, lower-risk, and problematic users using cross-tabulations and log-binomial regression models controlling for age, sex, and education. Results: Of 731 participants, 44% reported past-year cannabis use; of these, 63% were lower-risk users. Compared to problematic users, lower-risk users were more likely to be female, use cannabis less frequently, use alcohol and cannabis simultaneously, and report no mental health impact from cannabis. Problematic cannabis use was associated with daily cannabis use and regular cigarette smoking. However, daily/weekly users who used cannabis and alcohol simultaneously and those employing avoidance-coping strategies were more likely to report lower-risk cannabis use. Conclusion: Lower-risk cannabis users resemble non-users more than problematic users. While use frequency is key, other factors, such as cigarette smoking, distinguish problematic from lower-risk use. Findings underscore the importance of harm reduction strategies and evidence-based education for cannabis-related policies.

Guillaume Dubé, Université De Montréal

Prevalence and Determinants of Alcohol and Cannabis Co-Use Among Canadian Youth: Analysis of 2018/19 and 2021/22 CSTADS Data

Background: Co-use of alcohol and cannabis among youth in Canada is a growing public health concern, with potential implications for cognitive development, mental health, and risk-taking behaviours. Understanding the factors associated with co-use is essential for informing prevention strategies and policy interventions. Objectives: This study examines the prevalence and determinants of co-use among Canadian youth in 2018/19 and 2021/22. Methods: This study utilized data from the 2018/19 and 2021/22 cycles of the Canadian Student Tobacco, Alcohol and Drugs Survey (CSTADS). CSTADS employed a stratified single-stage cluster design to recruit students in grades 7 to 12 from schools across the 10 Canadian provinces. We used two questions to create a new variable to identify whether the student used both substances at any level. Logistic regression models were used to examine demographic characteristics and risk perception as factors associated with co-use. Results: The prevalence of co-use was 33% in 2018 (95% CI: 0.19–0.46), increasing to 42% in 2021 (95% CI: 0.38–0.42). The prevalence of co-use in urban areas remained high, at 83% in 2018 and 78% in 2021. Among students who reported co-use, 26% in 2018 and 36% in 2021 believed that cannabis legalization made it easier to get access to cannabis. In 2018, urban youth were three times more likely to co-use than rural youth (OR = 2.96, 95% CI: 0.89–9.77). In 2021, a higher grade was associated with a slight increase in the likelihood of co-use. Additionally, urban youth were 32.3% more likely to engage in co-use than rural youth (OR = 1.32, 95% CI: 1.07–1.64). Conclusion: Co-use among Canadian youth has increased from 2018/19 to 2021/22, especially among urban and older students. More youth perceived cannabis legalization as making access easier, potentially influencing increased use. Targeted prevention efforts should focus on urban youth, older students, and risk perception awareness.

Nazanin Jannati, INTERACT, Research Project Coordinator

Capturing the Full Picture: Trends in Concurrent Substance Use Among Youth in Canada, 2014–2024

Background: Amid Canada's overdose crisis, understanding youth substance use is crucial. While the prevalence of individual drug use is well-documented, research rarely reflects the reality that substances are not always used in isolation, distorting the true risks and harms youth face. Objectives: To identify common patterns of concurrent substance use among grade 7–12 students in Canada and to examine demographic and temporal differences. Methods: We used cross-sectional data from five cycles (2014–2024) of the Canadian Student Alcohol and Drugs Survey (CSADS), a biennial survey of grade 7–12 students in the provinces. We calculated weighted prevalences for past 12-month non-medical use of individual substances and their concurrent use. We computed prevalence differences with 95% confidence intervals for the five most common use patterns by grade and sex across cycles. Analyses by other demographic factors are currently underway and will be presented in the final results. Results: In 2023–24, most students (56%) reported no substance use in the past 12 months. Among those who did, 46% reported concurrent use of multiple substances, an increase of five percentage points since 2014–15. The most common patterns of use were alcohol only (18%), alcohol and cannabis (9%), over-the-counter medications only (4%), and alcohol, cannabis, and illegal drugs (3%). Over time, exclusive alcohol use declined by six percentage points, while exclusive non-medical over-the-counter medication use increased by three, becoming most common among younger students and males. In recent years, females increasingly reported concurrent use of alcohol and cannabis. Conclusions: The decline in exclusive alcohol use and increase in both concurrent substance use and over-the-counter medication use over the last decade suggest a shift towards riskier behaviours. Evolving trends and demographic disparities underscore the need for continued monitoring of real-world patterns and targeted prevention strategies.

Emilia Krzeminska, Health Canada

The impact of neighborhood-level marginalization on risk of opioid overdose: a population-based retrospective cohort study.

Background: The ongoing opioid crisis represents a major public health concern in Canada. In recent years, there has been increasing recognition of socioeconomic marginalization as a risk factor for opioid-related harm. However, research surrounding this relationship remains underdeveloped. Objective: To investigate the association between neighborhood-level dimensions of marginalization and risk of opioid overdose in Ontario, Canada. Methods: We conducted a retrospective cohort study from January 1st, 2016 to December 31st, 2021 using population-level administrative data. Neighborhood-level marginalization was measured by three dimensions (households and dwellings, material resources, and age and labour force) of the Ontario Marginalization Index. Fatal and non-fatal overdoses were extracted using ICD-10, DSM-5, and OHIP fee codes. Modified (robust) Poisson regression using Generalized Estimating Equations produced risk ratios (RRs) to assess the association between neighborhood-level marginalization and overdose. Multivariate modeling allowed for adjustment for demographic factors including age, sex, mental illness and substance use comorbidities, and income. Results: A random sample of 1, 808, 020 individuals was taken from all eligible Ontarians. A total of 7, 354 overdoses occurred within the observation period, 1,799 of which were fatal. The incidence of overdose and fatal overdose was 1.18 and 0.29 cases per 10,000 person years, respectively. In multivariate models comparing the lowest and highest marginalization quintiles, neighborhood housing instability (RR = 1.86, 95% CI:1.72–2.00), material resources (RR = 1.94, 95% CI: 1.80–2.09), and age and labour force (RR = 1.16, 95% CI: 1.09–1.23) were associated with overdose. Only neighborhood housing instability (RR = 1.80, 95% CI: 1.52–2.14) and material resources (RR = 2.16, 95% CI: 1.83–2.54) were associated with fatal overdose. Conclusion: Neighborhood-level marginalization significantly impacts risk of overdose, fatal or otherwise. This relationship is seen independently of income and demographic factors. Addressing social disadvantage should be made a priority amidst the ongoing opioid crisis.

Allison Liang, Queen's University

Income inequality and risk for early age of initiation of alcohol use. A longitudinal examination of Canadian Secondary school students.

Background: Early initiation to alcohol is a known predictor of long-term usage of alcohol with severe impacts on health. Income inequality has been associated with underage drinking. However, less is known about its influence to early initiation of alcohol use. This study examined the association between income inequality and the early age of initiation to alcohol. Methods: We used student cohort data (2017-2020) from the Cannabis, Obesity, Mental health, Physical activity, Alcohol, Smoking and Sedentary behavior project and census division (CD) data from the 2016 Canada census. Our sample was composed of 28,732 adolescents from 118 schools distributed in 39 CDs in 4 provinces in Canada (BC, AB, ON, QC). The outcome was defined as a nominal variable describing the age (in years) at which the student first drank alcohol that was more than a sip (never drunk, 8–12, 13-17, ≥18, and do not know). Income inequality (measured using the Gini index at the CD level) was grouped into tertiles (low, moderate, and high). Multilevel multinomial regression was used to examine the study objective. Results: After adjusting for individual (age, gender, ethnicity, spending money, physical activity, smoking status, cannabis use, depression status and province) and CD (income and population size) covariates, the odds of early initiation to alcohol at 8–12 years old relative to those who have never consumed alcohol was higher for students attending schools in areas with moderate (OR=1.37; 95% CI=1.18–1.60), and high (OR=1.43; 95% CI=1.16–1.78) income inequality areas compared to areas with low income inequality. The association between income inequality and other age groups was not significant. Conclusion: Our findings suggest that reducing income inequality may subsequently curb the initiation of alcohol consumption in the preadolescence stage. Public health should target alcohol prevention strategies among high school students in areas characterized with high-income inequality.

Jason Were, University of Alberta, Post Doctoral Research Fellow

Youth Vaping/Cigarette Use and The Impact on Physical Activity:A Longitudinal Analysis from 2021-2023

Background: Research on the relationship between vaping/smoking, and Physical Activity (PA) remains limited. Prior studies suggest that vaping/smoking may influence PA engagement. However, these findings were inconsistent, reported cross-sectionally, and underexplored gender differences. Objectives: This study examined the association between vaping/cigarette smoking and 1) meeting the Canadian physical activity guidelines (60 minutes/day) and 2) time spent engaging in PA (minutes). It also explored whether the associations differed by gender. Methods: A longitudinal analysis was conducted using secondary data from grade 7 to 11 students in the COMPASS study (2021–2023). Descriptive statistics assessed sample characteristics and the prevalence of vaping, smoking, meeting PA guidelines, and the average number of PA minutes. Mixed-effects logistic regression models evaluated the association between vaping/cigarette smoking and meeting PA guidelines, while linear regression models assessed the association between vaping/cigarette smoking and the time spent engaging in physical activity. Models were stratified by gender. Results: At baseline and follow-up, cis-girls had the highest prevalence of vaping (14.82 %, 18.49%), while gender-diverse students had the highest prevalence of smoking (5.63%, 6.53%). The overall model indicated that smoking was significantly associated with meeting the PA guidelines (OR:1.27, 95% CI: 1.12-1.45), however, the association diminished after adjusting for other variables. The association between vaping/smoking and meeting PA guidelines differed by gender. Linear regression models indicated that vaping was positively associated with PA time in the overall sample (β:41.83, 95% CI: 6.56-77.09), with differences by gender. Conclusion: A high proportion of adolescents who engaged in vaping and smoking met the PA guidelines, with some differences across gender subgroups. Differences between unadjusted and adjusted models suggest that other variables influence observed associations. These findings highlight the need for further research to examine the role of confounding factors and potential behavioural explanations for differences in PA among youth who vape/smoke.

Shaker Aljouuda

Change in Health-related Quality of Life in Siblings of Youth with Chronic Physical Illness: A latent class growth approach

Background: Chronic physical illness in youth can have a negative impact on the whole family to varying degrees. Cross-sectional evidence suggests that siblings of youth with chronic physical illness have worse HRQL than their peers without an ill sibling. Despite this, siblings are often neglected in family-centered care, and limited longitudinal research has explored HRQL in siblings. Objective: This study modelled trajectories of change in HRQL in siblings of youth with chronic physical illness over 48 months. Methods: Data come from MY LIFE, a longitudinal study that followed 263 ill youth and their siblings over 48 months. The parent-reported KIDSCREEN-27 was used to measure the HRQL of 171 eligible siblings across five dimensions (physical well-being (PHY), psychological well-being (PSY), autonomy and parent relations (APR), social support and peers (PSP), and school environment (SE)). Latent class growth modelling identified trajectories of change for each HRQL dimension, and multinomial regressions investigated predictors of trajectory group membership. Results: Three trajectory groups were identified for PHY, APR and SE, and were characterized as decreasing (PHY=12.8%; APR=12.3%; SE=29.3%), no change (PHY=75.8%; APR=76.9%; SE=66.0%), and increasing-stable (PHY=11.5%; APR=10.8%; SE=4.8%). Four groups were identified for PSY: large decrease (4.9%), small decrease (27.6%), no change (59.6%), and increase-stable (8.0%). Finally, two groups were delineated for SSP: decrease-increase (51.9%), and increase (48.1%). Compared to gradual-decrease group, being older predicted membership in the gradual-increase group for the PHY domain (OR=0.29,[1.04-1.71]). Conclusion: Most siblings exhibited no change or improvement in their HRQL, suggesting that they positively adapt to chronic physical illness in the family over time. While stability in HRQL does not necessarily indicate an optimal outcome, these findings highlight the importance of continued support for the psychosocial health of siblings within family-centred approaches to pediatric care. Future research should assess the mechanisms that influence change in sibling HRQL over time.

Dominique Basque, University of Waterloo, PhD Candidate

Predictors of Change in Trajectories of Health-related Quality of Life in Youth with Chronic Physical Illness

Background: Youth with chronic physical illness (YwCPI) report lower health-related quality of life (HRQL) compared to their healthy peers. Evidence shows minimal differences in HRQL across illness types, suggesting that contextual factors may play a greater role in shaping psychosocial health. Longitudinal research examining predictors of HRQL in YwCPI is scarce. Objectives: This study modelled trajectories of change in HRQL over 48 months among YwCPI and examined predictors of trajectory group membership. Methods: Data come from MY LIFE, an on-going longitudinal study of YwCPI. The parent-reported KIDSCREEN-27 was used to measure HRQL for 171 YwCPI across the domains of physical well-being (PHY), psychological well-being (PSY), autonomy and parent relations (APR), social support and peers (SSP), and school environment (SE). Latent class growth modelling identified trajectories of change in HRQL. Multinomial regressions identified individual and family-level predictors of trajectory group membership. Results: Three trajectory groups were identified for PHY (decrease=20.5%, no change=63.0%, increasing-stable=16.5%); PSY (decrease=18.4%, no-change=64.1%, increase-stable=17.5%), and SE (decrease=52.2%, no-change=42.6%), increase-stable=5.2%). Four trajectory groups were defined for APR (decrease=20.6%, no change=37.1%, small increase=34.0%, large increase=8.4%). Finally, two trajectory groups were identified for SSP (decrease-increase=79.8%, increase=20.2%). Compared to the most favourable trajectories (i.e., increasing), higher household income (PSY: OR=0.41 [0.17-0.98], APR: OR=4.91 [0.8-0.99]), higher parenting stress (APR: OR=0.89, [0.80-0.99]), and older child age (SE: OR=1.43, [1.00-2.04]) were associated with less favourable trajectories. Conclusion: This study identified distinct trajectories of change in HRQL and highlighted the relatively high burden of poor psychosocial health among YwCPI. Household income, parenting stress, and child age predicted change in HRQL over time and can help identify at-risk YwCPI. Most change in HRQL occurred early in the illness course, signalling the need for early psychosocial intervention to improve outcomes for YwCPI over the life-course.

Dominique Basque, University of Waterloo, PhD Candidate

Income inequality modified adolescent substance use trajectories from 2018-19 to 2020- 21: Findings from the COMPASS study

Background Little is known about the structural determinants of adolescent substance use during times of crises. Income inequality is an important structural determinant of adolescent health and has been previously associated with adolescent substance use. Objective This study examined whether income inequality altered trends in adolescent substance use during the COVID-19 pandemic. Methods Data from adolescents aged 12-19 (n = 22007) from the Cannabis, Obesity, Mental health, Physical activity, Alcohol use, Smoking, and Sedentary behaviour (COMPASS) study who participated in 2018-19, and at least one other year (2019-20 or 2020-21) was linked with census division (CD) data (n = 42) from the 2016 Canadian Census. Adolescents self-reported on their use of alcohol (including binge drinking), cigarettes, e-cigarettes, and cannabis via questionnaire. Income inequality was calculated at the CD-level of the school. Multilevel logistic regression models were used to examine whether income inequality was associated with changes in adolescent substance use through the inclusion of a cross-level interaction term (income inequality*time). Results The interaction term (income inequality*time) was significant for monthly use of cigarettes, e-cigarettes, and alcohol, indicating heterogenous trajectories based on CD income inequality. Students attending schools in less equal areas had higher odds of monthly cannabis use at baseline (OR = 1.49, 95% CI: 1.24, 1.80), but the interaction term was not significant indicating income inequality did not modify cannabis use trajectories over time. Income inequality was not associated with monthly binge drinking at baseline and did not modify trajectories over time. Gender stratified models revealed similar results for males and females except for e-cigarette use. Conclusion Income inequality may have modified adolescent substance use trajectories during the COVID-19 pandemic. More research investigating potential mechanisms (e.g., disaster preparedness, social capital, mental health) is needed.

Stephen Hunter, University of Alberta, Postdoctoral Fellow

Mental health programming during a time of crisis and adolescent anxiety and depressive symptoms: Longitudinal evidence from the OPHID study and three waves of the COMPASS study (2018-19 to 2020-21)

Background Crises place strain on public health systems which could result in disruptions to routine programs and services. This study examined whether public health unit (PHU) run mental health programs and services modified adolescent trajectories of anxiety and depressive symptomology during the COVID-19 pandemic. Methods A sample of 1,257 adolescents residing in Ontario, Canada who participated in the Cannabis, Obesity, Mental health, Physical activity, Alcohol, Smoking, and Sedentary behaviour (COMPASS) study starting in 2018-19, and followed up in 2019-20, and 2020-21 were included in this investigation. Adolescent demographic information, anxiety, and depressive symptoms were self-reported via questionnaire. PHUs (n=11) reported retrospectively on nine mental health programs and services and disruptions during the COVID-19 pandemic via the Ontario Public Health Information Database (OPHID) mental health program survey. Based on frequency distributions, we categorized by the number of programs offered (low: ≤6; high >6) and proportion of disruptions to programs experienced (low: <50%; high ≥50%) during the COVID-19 pandemic into four groups (low programs/low disruptions, low programs/high disruptions, high programs/low disruptions, high programs/high disruptions). Multilevel linear regression with interaction terms (PHU programs*time) were used to account for the nested structure of the data. Results The interaction term (PHU programs & disruptions*time) was significant for depression but not anxiety. Adolescents from PHU regions that experienced high disruptions (with either low or high existing programs) to mental health programs experienced positive slopes (increases) in depressive symptoms from 2019-20 to 2020-21 (low/high: ∂ = 1.54, 95% CI:1.10, 1.98; high/high: ∂=1.40 ,95% CI:0.39,2.40), whereas those from PHU regions with low disruptions experienced negative slopes (decreases) in depressive symptoms (low/low:∂ = -0.67, 95%CI: -1.68, 0.35; high/low:∂= -0.03, 95% CI: -2.66, -0.64). Conclusion The level of PHU mental health programs and disruptions modified adolescent trajectories of depression symptoms. Robust public health systems are needed during times of crisis.

Stephen Hunter, University of Alberta, Postdoctoral Fellow

Identifying trajectories of hair cortisol in children with a chronic physical Illness: A latent class growth analysis and associations with psychopathology

Background: One in four children are affected by a chronic physical illness (CPI). Children with a CPI experience significant stress and are at a greater risk of psychopathology. Hair cortisol concentration (HCC) is a novel biomarker for chronic stress, and elevated HCC has been linked to increased psychopathology. However, research examining HCC over time in children with a CPI and its relationship with psychopathology is limited. Objectives: This study identified trajectories of HCC in children with a CPI, explored predictors of trajectory membership, and examined associations between trajectories and psychopathology. Methods: Data come from a sample of 244 children aged 2-16 with a CPI, who were followed over 48-months. Children provided 3-cm hair samples for cortisol assay and parents reported psychopathology symptoms using the Emotional Behavioural Scales. Latent class growth models identified HCC trajectories, and multinomial regressions identified predictors of trajectory membership. Linear mixed effects models examined associations between HCC trajectories and psychopathology. Results: We identified three HCC trajectories: High-Unstable (HU: 68.03%), Low-Stable (LS: 8.61%), and High-Decreasing (HD: 23.36%). Significant predictors of belonging to the LS vs. HU class included female sex, a less recent CPI diagnosis, and having an older parent. Older children were less likely to belong to the HD vs. HU class. When adjusting for sociodemographic characteristics, children in the HD class had lower internalizing (β=-3.17, p=.005) and externalizing (β=-2.27, p=.007) psychopathology symptoms compared to the HU class. There was no difference in symptoms between the LS and HU classes. Conclusion: Findings suggest that children with a CPI follow distinct HCC trajectories. Children who followed a decreasing trajectory exhibited lower psychopathology symptoms compared to children who followed a consistently elevated trajectory, indicating that chronically high cortisol levels may contribute to the development of psychopathology. Findings can support the early identification of children at elevated risk of psychopathology.

Emma Littler, University Of Waterloo, PhD Candidate

Trajectories of hair cortisol and psychopathology in children with a chronic physical illness: The moderating impacts of parent- and family-related factors

Background: Children with a chronic physical illness (CPI) experience significant stress and are at a greater risk of psychopathology. However, little is known about the relationship between chronic stress and psychopathology in this population, and it is presently unclear whether parent- or family-related factors impact this relationship. Hair cortisol concentration (HCC) is a novel biomarker of chronic stress, and elevated HCC has been linked to increased psychopathology. Objectives: This study identified HCC trajectories in children with a CPI and examined whether parent- or family-related factors impacted associations between trajectories and child psychopathology. Methods: Data come from a sample of 244 children aged 2-16 with a CPI, who were followed over 48-months. Children provided 3-cm hair samples for cortisol assay. Parents completed the Emotional Behavioural Scales for child psychopathology, along with additional survey measures for parental depression, parental anxiety, parenting stress, and family functioning. Latent class growth models identified HCC trajectories, and linear mixed effects models examined the moderating impacts of parent- and family-related factors on the associations between HCC trajectories and child psychopathology. Results: We identified three HCC trajectories: High-Unstable (HU: 68.03%), Low-Stable (LS: 8.61%), and High-Decreasing (HD: 23.36%). Parental anxiety and parenting stress moderated the effect of trajectory class on internalizing scores; higher anxiety (β=-0.64, p=.026) and stress (β=-0.26, p=.049) was associated with lower scores for the LS vs. the HU class. Parental anxiety also moderated the effect of trajectory class on externalizing scores; higher anxiety was associated with lower scores for the HD vs. the HU class (β=-0.26, p=.045). Family functioning moderated the effect of trajectory class on internalizing scores; worse functioning was associated with lower scores for the HD vs. the HU class (β=0.27, p=.044). Conclusion: Findings can support the implementation of parent- and family-centred interventions to reduce psychopathology in children with a CPI experiencing chronic stress.

Emma Littler, University Of Waterloo, PhD Candidate

Exploring the association between contemporary risk-behaviour engagement and mental well-being in adolescents

Background: Adolescents commonly engage in multiple risk-taking behaviours that are found to cluster together. Moreover, emerging risk-taking behaviours that are rising in popularity among adolescents are associated with new types of substance use and engagement with virtual worlds mediated by social media platforms. These contemporary risks exacerbate the potential for negative health outcomes. Objectives: (1) To confirm the efficacy of a newly developed scale characterizing contemporary adolescent risk-taking, (2) examine the relationship between contemporary risk-taking participation and well-being, and (3) investigate if the strength of this association differs by sex. Methods: Data came from the ninth cycle (2022-23) of the Canadian Health Behaviour in School-aged Children (HBSC) study. After using a complete case analysis approach (n=6799), data adequacy was confirmed, and descriptive analyses were conducted. Structural equation modelling (SEM) was employed to investigate this association. A moderation analysis was then used to look at sex as a potential effect modifier. Results: The SEM model displayed that higher engagement in each type of adolescent contemporary risk-taking was associated with a reduction in well-being (CFI = 0.98, TLI = 0.98, RMSEA = 0.05, SRMR = 0.07, x2(164) = 2834.63). From the three risk-taking clusters, a small effect size was noted with higher engagement in forms of online risks (-0.21) and contemporary substance use (-0.19) than sexting (-0.10) having a larger impact on an adolescent's well-being. There was an absence of significant differences when accounting for sex, confirming the strength of the overall model. Conclusion: We tested an empirical model that illustrates the negative relationship between adolescent contemporary risk-taking and well-being. Understanding the changing landscape of adolescent risk-taking is essential to adolescent health research. Study findings support the use of this scale and the potential for it to be applied to research on adolescent risk-taking and health.

Larissa Lobo, Brock University

Measurement Invariance of a Brief Disordered Eating Scale in a Large Sample of Secondary School Students in Canada

Background and objectives: Brief measures of disordered eating (DE) that demonstrate validity among diverse adolescents are needed for population-level surveys. This study aimed to 1) assess the measurement invariance of a short DE scale among Canadian high school students, and 2) estimate differences in scale scores across student sociodemographic subgroups. Methods: We used student-level survey data from the 2021/2022 COMPASS study, including 24,639 students in Grades 9-12 from 69 secondary schools in Alberta, British Columbia, and Ontario. Multi-group confirmatory-factor-analysis assessed measurement invariance (i.e., configural, metric, scalar, and strict invariance) of the 6-item DE scale. Scale items assessed the frequency of DE thoughts and behaviors (e.g., weight preoccupation; purging; binging; laxative, diet pill, diuretic, or steroid use) over the last 12 months. One-way-ANOVA and mixed-linear-regression estimated score differences across student grade, gender, race and ethnicity, family affluence, and weight subgroups. Results: The DE scale demonstrated full measurement invariance across all subgroups. Higher sum DE scores were found among students in Grade 12 ($\beta = 0.52$, $p < .0001$), transgender-and gender-diverse youth ($\beta = 3.76$, $p < .0001$) and cisgender-girls ($\beta = 3.80$, $p < .0001$), adolescents of Middle Eastern ($\beta = 0.53$, $p < .05$) and Another/Multiethnic identity ($\beta = 0.29$, $p < .05$), students from less affluent households ($\beta = 1.52$, $p < .0001$), and those with higher weight ($\beta = 3.55$, $p < .0001$), relative to their grade 9, cisgender boys, White, more affluent, and lower weight peers, respectively. Conclusion: The DE scale appears to measure the same construct across diverse adolescent subgroups, providing confidence that observed scale score differences reflect actual disparities in DE rather than artifactual differences in scale interpretation. This brief measure shows promise for large-scale youth surveys, with findings highlighting elevated DE risk among specific subgroups. Further psychometric testing is warranted. Targeted interventions are needed to address disparities in DE risk.

Lin Zheng, Brock University