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Book of Abstracts- Orals

Session ID: A1.1, COVID Surveillance

Detection of Simulated COVID-19 Outbreaks in Ontario, Canada, during 2021 using an Endemic-Epidemic Space-Time Model

Presented by: Armin Orang

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Abstract

Objectives: Detecting outbreaks accurately and in a timely manner is a key objective for public health surveillance. A variety of outbreak detection algorithms are currently integrated throughout surveillance systems globally. The Farrington Flexible algorithm (FF) is frequently applied. However, this algorithm does not adjust for known risk factors or other indicators for space and/or time effects, which plays a substantial role in the spread of infectious disease. The goal of this study was to evaluate the performance of a spatio-temporal epidemic-endemic model (hhh4) for outbreak detection.

Methods: The dataset consisted of daily COVID-19 cases in Ontario, Canada from January 15, 2020, to December 3, 2021. No outbreak was detected in the original data at the public health unit level by the FF algorithm. Therefore, a series of outbreaks were superimposed on real time series data. An additional simulated data set (simulation of both outbreaks and the time series) was computed. Model performance was assessed via sensitivity, specificity, and average time to detection measures. Performance of the hhh4 model was benchmarked against the FF algorithm.

Results: FF had higher sensitivity and timeliness measures for both datasets. However, hhh4 had higher specificity while maintaining an adequate level of sensitivity and timeliness when applied to simulated data.

Conclusion: For fully simulated data, hhh4 detected COVID-19 outbreaks in an accurate and timely manner.

Model performance could be further improved by optimizing a decision threshold using the Receiver Operator Characteristic curve. Surveillance systems should include spatio-temporal outbreak detection models for more reliable results.

Session ID: A1.2, COVID Surveillance**Seroprevalence and serological kinetics of SARS-CoV-2 infection among a cohort of children and youth in Montreal, QC****Presented by: Laura Pierce**

All Authors: Kate Zinszer^{1, 2}, Katia Charland¹, Laura Pierce¹, Adrien Saucier¹, Britt McKinnon^{1, 3}, Marie-Ève Hamelin⁴, Islem Cheriet², Margot Barbosa Da Torre¹, Julie Carbonneau⁴, Cat Tuong Nguyen⁵, Gaston De Serres⁶, Jesse Papenburg⁷, Guy Boivin⁴, Caroline Quach^{2, 8}

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Abstract**Objectives**

In this prospective cohort study, we used serological testing to assess the seroprevalence, seroconversion, and seroreversion of infection-induced anti-SARS-CoV-2 antibodies in children and youth in Montreal, Canada. We also identified characteristics of study participants associated with increased risk of infection-induced SARS-CoV-2 seroconversion.

Methods

The EnCORE study is a cohort of participants aged 2-18 years who provided up to four dried blood spot samples between 2020-2022. Enzyme-linked immunosorbent assays were run using up to three antigens to determine individuals' serostatus for infection-induced antibodies regardless of vaccination status. Parent questionnaires included sociodemographics and COVID-19 tests. Using samples collected between May-October 2022, we estimated unadjusted seroprevalence estimates using logistic regression and inverse probability weighting. Crude seroconversion rates and adjusted seroconversion rate ratios were estimated using multivariable quasi-Poisson regression. Using samples collected up to March 2022, we also estimated the likelihood of seroreversion of infection-induced antibodies at six months and one year with Kaplan-Meier curves.

Preliminary results

In May-October 2022, the weighted infection-induced seroprevalence among 726 participants was 58.4% (95% CI 54.7-62.1%). The seroconversion rate was 139 per 100 P-Y (N=396); 9-12 times higher compared to earlier rounds of data collection. Seroconversion rates were higher in 2-4 year-old children and among females and children of parents identifying as a racial or ethnic minority. The likelihood of remaining seropositive with infection-induced antibodies at six months was 68% (95% CI 59-77%) and dropped to 41% (95% CI 31%-55%) at one year (N=141).

Conclusion

SARS-CoV-2 seroprevalence among the EnCORE cohort in May-October 2022 reflects the context of Omicron dominance during this time, with higher rates of seroconversion among young children compared to older children. Frequent seroreversion was also observed from earlier study data, indicating the importance of continued examination of waning and hybrid immunity.

Session ID: A1.3, COVID Surveillance

Inferring the incidence of SARS-CoV-2 infection from wastewater and serological data

Presented by: Nathan Duarte

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Abstract

OBJECTIVES: Serosurveillance allows accurate measurement of the extent of infection during a pandemic, but it is not a timely indicator because SARS-CoV-2 seroconversion only occurs ~2 weeks after infection and serosurvey results are often released months after data collection. The concentration of SARS-CoV-2 in wastewater is a more timely metric, which has been used to identify regions with a relatively high prevalence of infectious individuals. Given their complementary characteristics, wastewater and serological data could be jointly analysed to develop timely and unbiased estimates of the incidence of infection within a population. We aimed to develop and evaluate statistical methods to quantify the relationship between wastewater and serological data to infer the incidence of SARS-CoV-2 infection.

METHODS: We used serological data sampled from blood donors, collected by Canadian Blood Services, together with wastewater data sampled from 4 wastewater treatment plants (WWTPs) in Toronto. We pre-processed these data into weekly time series of the anti-nucleocapsid (anti-N) SARS-CoV-2 seroprevalence and of the concentration of SARS-CoV-2 in wastewater. To estimate the incidence of SARS-CoV-2 infection, we fit a Bayesian model in which these two epidemiological signals are generated from an underlying, unobserved infections process.

PRELIMINARY RESULTS: We estimated that up to ~10% of the population was infected per week during the first Omicron wave. The inclusion of wastewater data increased confidence in our estimates. The statistical relationship between anti-N SARS-CoV-2 seroprevalence and the concentration of SARS-CoV-2 in wastewater was stable until after the first Omicron wave, after which the nature of the relationship appeared to change.

NEXT STEPS: We will incorporate time-variant factors (e.g., precipitation, temperature) and regional hierarchy into our model. We will analyse data from 13 other WWTPs beyond Toronto. We will draw conclusions about the value of wastewater surveillance when combined with serosurveillance to estimate the incidence of SARS-CoV-2 infection.

Session ID: A1.4, COVID Surveillance

Analysis of anti-SARS-CoV-2 antibodies induced by COVID-19 vaccination: A nested-multicenter prospective cohort study

Presented by: Jian-Yi Xu

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Abstract

Background: Vaccination was one effective and economical prevention strategy to control the global COVID-19 pandemic. Knowledge of vaccine-induced anti-SARS-CoV-2 antibodies is essential to support the evaluation of population immunity against COVID-19. **Objectives:** The study aimed to capture information on vaccine-induced COVID-19 seroprevalence and its associated factors.

Methods: Alberta's Tomorrow Project (ATP) conducted a COVID-19 Antibody Testing study nested in an existing prospective health research platform where 4,104 participants (mean age of 60.6 (SD: 9.8) years; 60% female) were invited to complete questionnaires and provide blood samples every four months. The study centres in Calgary, Red Deer, Edmonton, and Lethbridge were launched on a rolling basis beginning in September 2020 and data collection was completed in May 2022. The questionnaire collected information on COVID-19 testing and symptoms, vaccination, public health behaviors, etc. The blood samples were tested for COVID-19 antibodies. The generalized estimating equation method was used to assess the anti-SARS-CoV-2 spike protein level predictors.

Preliminary Results: About 18% of participants have experienced a COVID-19 infection and 96% of participants received at least one COVID-19 vaccine dose. Full vaccination can reduce the risk of COVID-19 infection (odds ratio (OR) for 2 doses: 0.43, 95% CI: 0.29-0.64; OR for booster: 0.37, 95% CI: 0.25-0.55). Although the spike protein level progressively decreased over time, the concentration above the "positive" threshold (≥ 50 BAU/ml) lasted up to 240 days after the second vaccination dose. Booster doses induced both higher spike antibody concentration and longer duration above positive threshold. A sex-based difference was detected in spike antibody level. Prior infection with COVID-19 was associated with a higher spike antibody level.

Conclusion: These data indicate that full vaccination can reduce the risk of COVID-19 infection and induce an effective and lasting spike antibody concentration. Information from this study could be used to inform an evidence-based COVID-19 response.

Session ID: A1.5, COVID Surveillance

COVID-19 Harmonized Databank on Risk factors, Infections, Vaccination & Serology

Presented by: Ahmed Moustafa Ahmed

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Abstract

Objective:Enabling the sharing of research data can accelerate research, which is particularly important in the context of a novel health emergency. We implemented a process to standardize, centralize, harmonize, and make accessible for further research, individual-level data from participants in over 70 epidemiological studies of immunity to COVID-19 in diverse populations across Canada.

Methods:All studies were supported in developing consent materials so that they could ethically and legally deposit data into the Databank. Standardized questionnaire items covering domains such as demographics, COVID-19 history and vaccination, and SARS-CoV-2 serology (termed Core Data Elements (CDE)) were designed through a rigorous consultation process with committees of scientific experts. Studies were supported in the adoption of the CDE into their data collection frameworks. Following the successful negotiation of a data sharing agreement (DSA), each study shared their data dictionary including data variable definitions. Data definitions were clarified to avoid inconsistencies and guidance on data formatting was provided. Each study then deposited a dataset in the Databank by uploading it to a secure server. A harmonization process was then applied with the aim of creating a pooled dataset across the data from all studies where all variables in the harmonized dataset are recorded consistently in terms of structure and meaning. **Preliminary results:**Of the 70 studies eligible to deposit data in the Databank, 46 studies have signed an agreement, 30 studies have initiated the data centralization process, and 14 studies have uploaded data that are currently being harmonized.

Next steps:Centralization of data from studies and harmonization are ongoing, with individual study datasets and harmonized datasets available for further research through the data access office. The proportion of variables from each individual study data that can be included in the harmonized datasets will be recorded as an outcome of the CDE standardization procedures.

Session ID: A2.1, Mental Health and Substance Use (Children)

Childhood maltreatment and major depressive disorder in well-being: A network analysis of a longitudinal community-based cohort

Presented by: Yingying Su

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Abstract

Objectives: Little has been done to comprehensively study the relationships between multiple well-being constructs at a time. Even less is known about whether child maltreatment and major depressive disorder (MDD) impact different well-being constructs. This study aims to examine whether maltreated or depressed individuals have specific impacts on well-being structures.

Methods: Data were from the Montreal South-West Longitudinal Catchment Area Study (N=1380). The potential confounding of age and sex was controlled by propensity score matching. We used network analysis to assess the impact of maltreatment and MDD on well-being. The centrality of nodes was estimated with the "strength" index and a case-dropping bootstrap procedure was used to test network stability. Differences in the structure and connectivity of networks between different studied groups were also examined.

Results: Autonomy and daily life & social relations were the most central nodes for the MDD and maltreated groups (MDD group: Strength Coefficient (SC)autonomy=1.50; SCdaily life & social relations=1.34; Maltreated group: SCautonomy=1.69; SCdaily life & social relations=1.55). Both maltreatment and MDD groups had statistical differences in terms of the global strength of interconnectivity in their networks. Network invariance differed between with and without MDD groups indicating different structures of their networks. The non-maltreatment & MDD group had the highest level of overall connectivity.

Conclusions: We discovered distinct connectivity patterns of well-being outcomes in maltreatment and MDD groups. The identified core constructs could serve as potential targets to maximize the effectiveness of clinical management of MDD and also advance prevention to minimize the sequelae of maltreatment.

Session ID: A2.2, Mental Health and Substance Use (Children)

[Mental health service use for children with a chronic physical illness](#)

Presented by: Lauren Gosse

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Abstract

Youth with multimorbidity (i.e., co-occurring physical and mental illness) are significantly more likely to experience adverse mental health. While mental health service use (MHSU) amongst Canadian youth has increased in the past two decades, the extent of service use among those with multimorbidity is relatively unknown. The cross-sectional design of previous research limits our understanding of how MHSU for youth with multimorbidity changes over time and the factors that predict differences in patterns of use. This study used longitudinal data to overcome limitations of previous work to better understand MHSU among youth with multimorbidity. Data come from 263 youth aged 2-16 years who were diagnosed with a chronic physical illness and recruited from a pediatric hospital in Ontario. Univariate statistics were used to describe the mental health services used by youth with multimorbidity. Latent class analysis was used to identify patterns of use (e.g., primarily hospital-based vs. community-based). Finally, multinomial regression was used to model baseline sociodemographic and health factors associated with different patterns of MHSU. Across all timepoints, approximately one quarter of parents reported that their child had some form of contact with a health professional for their mental health (24.7%). Latent class analysis determined a two-class model with one class reporting any contact for their mental health (11.4% at baseline; 16.4% at 24 months) while the other class reported no service use regarding their mental health (88.6% at baseline; 83.7% at 24 months). In a fully-adjusted model, youth age, presence of one or more mental illness, level of disability, and parental educational attainment differed significantly between classes. Findings suggest increased service use in this sample compared to the general population. Further exploration is required to parse changes in service use over a longer time frame and with a larger subset of youth reporting service use.

Session ID: A2.3, Mental Health and Substance Use (Children)

Examining informant reports of youth delinquent behaviours in school and home settings using the Trifactor Model.

Presented by: Alex Luther

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Abstract

Background: It is best practice in clinical contexts that multiple informants provide assessments of youth delinquent behaviours, though this may lead to information discrepancies. Informant discrepancies can impact assessment and service access to reduce youth delinquency and its sequelae. **Objectives:** This study aimed to develop a trifactor model to investigate how youth and informant (parent and teacher) characteristics influence levels of agreement and reports of youth delinquency.

Methods: Five delinquency items reported by parents and teachers (cruelty, vandalism, theft, violence, and truancy) were used as latent variable indicators for the trifactor model. The sample consisted of 2,376 youth aged 4-14 years (51% male) in the 2014 Ontario Child Health Study. **Results:** Informant agreement was low or failed to exceed the threshold of agreement for all items ($\kappa \geq 0.20$). Older youth age, female reporting parents, lower household income, immigrant status, and parental depression, were associated with greater agreement between parents and teachers, while lower parental education and greater teacher experience were associated with lower agreement. Male sex (both parent and youth) and parental depression were associated with higher frequency of delinquency reported by parents. Younger youth and male teachers were associated with higher teacher-reported frequency.

Conclusions: Parent and teacher reports each contribute unique information to assessing delinquent behaviours and should be maintained to accurately determine appropriate strategies for reduction among youth.

Session ID: A2.4, Mental Health and Substance Use (Children)

Predictive Ability of Self-Reported Diagnosis of Attention-Deficit/Hyperactivity Disorder and Risk Perception Towards Cannabis use to Identify Youth at Risk of at Least Weekly Cannabis Use

Presented by: Marie-Pierre Sylvestre

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Abstract

Background & Objective: Cannabis is among the leading psychoactive substances used in Canada. Identifying adolescents at greater risk of frequent cannabis use is relevant for prevention and harm reduction. We investigate the added value of including two predictors (self-reported diagnosis of attention-deficit/hyperactivity disorder (ADHD) and the risk perception towards cannabis use) in a recently developed screening tool to identify youth who are at the greatest risk of transitioning to weekly cannabis use in the next year.

Methods: Data were drawn from 36 schools sampled in Quebec, Canada as part of the COMPASS study, an ongoing prospective study (inception 2012-13) of grade 9-12 students in a convenience sample of Canadian high schools. Students complete in-class self-report questionnaires annually. The initial prognostic tool included 8 predictors. We compared the fit of the logistic model from which the initial tool was derived with a new model also including self-reported ADHD diagnosis and perceived risk to health from regular cannabis use. We calculated the adequacy index to quantify the added predictive value of the new predictors. **Results:** A total of 7,325 students were used in the analysis. The 1-year cumulative incidence of weekly cannabis use was 2.9%. The inclusion of self-reported ADHD diagnosis and perceived risk to health from regular cannabis use improved the model fit significantly (p -value < 0.001). Adding ADHD and risk perception towards cannabis improved the predictive value of the model by 2.6% and 4.3% respectively, while their joint contribution was 6.7%, suggesting that the information provided by each predictor was not redundant.

Conclusion: ADHD diagnosis and risk perception towards cannabis use are easy-to-inquire variables that independently improve the predictive ability of a previously developed prognostic tool to identify youth at the risk of initiating weekly cannabis use in the next year.

Session ID: A2.5, Mental Health and Substance Use (Children)

The causal effect of religious service attendance on risk factors for the deaths of despair: Evidence from instrumental variable and sibling fixed effects analyses

Presented by: Michael Lebenbaum

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Abstract

Objectives: There has been a large increase in the "deaths of despair" (suicide, opioid overdose, liver failure) among Americans. Whether the large secular decline in religiosity has contributed to this trend is unclear. We contribute to the recent epidemiologic literature estimating more robust causal effects of religiosity on health by examining the causal effect of religiosity on key risk factors for the deaths of despair.

Methods: We used the US Add-Health sample restricted to individuals who were liberal, moderate, or conservative Protestants, Catholics, or Jews at Wave1 (ages: 10-19). For Wave3 (ages: 18-24), Wave4 (ages: 24-32) and Wave5 (ages: 32-42), we derived religious service attendance and a composite outcome consisting of painkiller use (Wave3: past 6-years, Wave4: ever, Wave5: past 30-days), past-year suicidal ideation and weekly binge drinking. Painkiller use included those not prescribed, used differently than prescribed, or taken for pleasure. We estimated linear probability models, sibling fixed effects (SFE), and instrumental variable (IV) models using Wave1 parental religious preferences and county-level proportion of population who are of the same religion as instruments. Covariates included parental socio-demographic characteristics and alcoholism, Wave1 county or census tract characteristics, individual verbal intelligence and socio-demographic characteristics. **Results:** Greater religious service attendance was negatively associated with the composite outcome (Wave3 $\beta=-0.035$; Wave4 $\beta=-0.054$; Wave5 $\beta=-0.036$; Wave3-5 pooled $\beta=-0.042$; all $p < 0.001$). Conclusions were similar in SFE models (Wave3-5 pooled $\beta = -0.015$, $p < 0.05$) and IV models (Wave3 $\beta = -0.051$, $p = 0.062$; Wave4 $\beta = -0.097$, $p < 0.001$; Wave5 $\beta = -0.038$, $p > 0.1$; Wave3-5 pooled $\beta = -0.062$, $p < 0.01$; all $F > 95$, all overidentification $p > 0.05$).

Conclusion: The consistent results across models suggests a large causal protective effect of religious service attendance on the risk factors for the deaths of despair and that the large decline in attendance likely contributed to the rise in the deaths of despair.

Session ID: A3.1, Clinical Epidemiology (Methods)

Radiomics analysis to predict pulmonary nodule malignancy using machine learning approaches

Presented by: Matt Warkentin

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Abstract

Objectives: Regular screening of high-risk individuals with low-dose computed tomography can reduce lung cancer-related mortality. However, most screen-detected pulmonary abnormalities do not develop into cancers, and it remains a challenge clinically to identify high-risk actionable nodules from among those that are benign. In this study, we aimed to develop and validate prediction models to discriminate between benign and malignant pulmonary lesions based on radiological features.

Methods: Using images from four international lung cancer screening studies, we extracted 2,060 radiomic features for each of 16,797 nodules among 6,865 participants. After filtering out redundant and low-quality radiomic features, 642 radiomic and 9 epidemiologic features were available for model development. We used 10-fold cross-validation and grid search to assess three machine learning (ML) models (XGBoost, Random Forest, LASSO) for their ability to accurately predict risk of malignancy for pulmonary nodules. We fit the top-performing ML model in the full training set (80%). We report model performance based on the area under the ROC curve (AUC) and calibration metrics in the held-out test set (20%). **Results:** The ML models that yielded the best predictive performance in cross-validation were XGBoost and LASSO, and among these models, LASSO had superior model calibration, which we considered to be the optimal model. We fit the final LASSO model based on the optimized hyperparameter from cross-validation. Our radiomics-based model was both well-calibrated and had a test-set AUC of 0.93 (95% CI: 0.90-0.96) and out-performed the established Brock/PanCan model (AUC=0.87, 95% CI: 0.85-0.89) for nodule assessment. Our model performed well among both solid (AUC=0.93, 95% CI: 0.89-0.97) and subsolid nodules (AUC=0.93, 95% CI: 0.89-0.97).

Conclusions: We developed highly-accurate machine learning models based on radiomic and epidemiologic features from four international lung cancer screening studies that may be suitable for assessing suspicious, but indeterminate, screen-detected pulmonary nodules for risk of malignancy.

Session ID: A3.2, Clinical Epidemiology (Methods)

Item-Focussed Trees to Detect Differential Item Functioning in Patient-Reported Outcome Measures

Presented by: Muditha Bodawatte Gedara

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Abstract

Objectives: Patient-reported outcome measures (PROMs) are multi-item patients appraisals about their well-being and quality of life. Differential item functioning (DIF), a form of measurement bias, occurs when patients with the same health status do not interpret PROMs items similarly. Logistic regression (LR) models are commonly used to detect DIF. Recently, item-focussed tree (IFT) models that combine recursive partitioning with the LR model have been proposed; these models do not require prior knowledge about patient characteristics associated with DIF. We compared IFT and LR models for DIF detection in the Hospital Anxiety and Depression Scale (HADS), a validated PROM commonly used in patients with chronic diseases.

Methods: Data were from Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease registry. We tested for uniform (same DIF direction across covariates) and non-uniform DIF (different DIF direction across covariates) separately on the 7-item depression and anxiety subscales. The covariates were sex, age, body mass index (BMI), and number of comorbid conditions. Consistency of DIF detection was assessed using ten-fold cross-validation. Model calibration was assessed using the Brier score. **Results:** 7185 patients were included. Sex, age, and BMI were associated with uniform DIF on 5 of 7 HADS depression items across at least eight data folds for the LR model and at least four folds for the IFT model. For both models, age and sex were associated with uniform DIF in two anxiety items and with non-uniform DIF in two depression and one anxiety items across ten folds. Brier scores of the LR and IFT models were below 0.15, indicating good calibration.

Conclusion: LR and IFT models were not equally sensitive to detect DIF, but had similar calibration error. Computer simulations will be used to assess Type I error and power of IFT and LR models to detect DIF under different data-analytic conditions.

Session ID: A3.3, Clinical Epidemiology (Methods)

Factors Associated with Data Contribution to Individual Participant Data Meta-analyses: A Review of 456 Eligible Studies from Four Depression Screening Tool Accuracy Meta-analyses

Presented by: Yin Wu

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Abstract

Objectives: This study used individual participant data meta-analysis (IPDMA) diagnostic test accuracy (DTA) datasets from the DEPRESSion Screening Data (DEPRESSD) project to evaluate the proportion of eligible primary studies that contributed data overall and by IPDMA; identify characteristics of eligible studies associated with data contribution; and characterize reasons for non-contribution among non-contributors.

Methods: We reviewed dataset contributions to 4 IPDMAs, including datasets of studies conducted with the Patient Health Questionnaire (PHQ), Hospital Anxiety and Depression Scale - Depression subscale (HADS-D), Edinburgh Postnatal Depression Scale (EPDS), and Geriatric Depression Scale (GDS). We fitted a logistic regression model to evaluate primary study factors associated with data contribution.

Results: The study found that 65% (295/456) of eligible primary studies contributed individual participant data. More recent year of publication and higher journal impact factor were positively associated with greater odds of data contribution. Additionally, studies conducted in Australia or New Zealand, Germany, Canada, Brazil, the Netherlands, other European countries, Middle Eastern or African countries or Central or Southern American countries were more likely to contribute data (reference=the USA). Other factors positively associated with data contribution were recruitment in inpatient care or non-medical settings (reference=outpatient settings), studies that reported DTA results and drew negative conclusions (reference=positive conclusions), and studies that were funded. On the other hand, studies of GDS (reference = PHQ) and lack of funding information were negatively associated with data contribution. Over 80% of non-contributions were due to authors being unreachable despite multiple attempts or lost contact or data being unavailable.

Conclusion: As the first study that investigated data contribution in IPDMAs of DTA studies, the present study provides insights on factors that associated with data contribution in this field which may shed lights on future research to promote data sharing.

Session ID: A3.4, Clinical Epidemiology (Methods)

Comparison of Outlier Detection Methods for Meta-analyses of Site-specific Effect Estimates from a Multi-site Network: Results from a Simulation Study

Presented by: Henry Ratul Halder

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Abstract

Objectives: Data privacy legislation prohibits patient-level administrative health data from crossing jurisdictional boundaries. Accordingly, multi-site research networks conduct distributed analyses and pool site-specific effect estimates (EEs) using meta-analysis models. Rare outcomes and heterogeneity in site-specific EEs can produce potential outliers that may bias pooled EEs. Our research objective is to compare the performance of outlier detection methods for random-effects (RE) meta-analysis models.

Methods: We used computer simulation to compare four methods: studentized residual estimates (StdR), relative change in pooled effect estimate variance (RCPEV), relative change in estimated between-site variance (RCEBV), and model-based mean-shift method (MMS). EEs were simulated assuming a normal distribution, where the mean EEs for outlier and non-outlier sites varied across simulation parameters, including number of sites, number of outliers, within-site variance, and between-site variance. Performance metrics included accuracy, misclassification error (ME), and F1 score (harmonic mean of precision and recall). One-way RE models estimated the proportion of variance explained by simulation parameters for 1000 simulation replications. **Preliminary Results:** StdR had the highest accuracy (mean: 89.3%) and the lowest ME (mean: 10.7%). RCEBV had the highest F1 score (mean: 43.0%). For StdR, between-site variance explained 60.2% of variation in F1 scores; the number of sites explained 44.1% and 50.2% of variation in accuracy and ME. For RCPEV and RCEBV, mean EEs for outlier sites described the most variation in all performance metrics. For MMS, the number of sites explained 90.8% and 92.9% of variation in accuracy and ME, respectively; within-site variance explained 98.6% of variation in F1 scores. **Next Steps:** StdR and RCEBV outperformed the other methods for all performance metrics. However, RCEBV showed larger variation in all performance metrics compared to StdR. We aim to re-analyze meta-analyses from the Canadian Network for Observational Drug Effect Studies to identify potential outliers and their effect on pooled EEs.

Session ID: A3.5, Clinical Epidemiology (Methods)

The Relationship between Sample Size and Trial Quality and their Influence on the Interpretation of a Systematic Review Effect Size Estimate

Presented by: Alanna MacDonald

All Authors: Alanna MacDonald¹, Shazia Kashif¹, Jenna Ellis¹, Jill Hayden¹

Author Affiliations: ¹Dalhousie University

Abstract

Objectives Randomized controlled trials are the gold standard study design for investigating treatment effectiveness and are commonly synthesized in systematic reviews. While sample size can impact interpretation of results from single trial results, meta-analysis allows pooling of similar trials to increase the overall sample size. This may become problematic, as smaller studies may be more susceptible to publication bias and may be more likely to have design, conduct or reporting limitations that lower their quality of evidence. The proportion of smaller studies published has been noted to be increasing, so it is critical to explore the potential impact of their inclusion in systematic reviews. The objectives of this study are to examine the relationship between study sample size and review quality characteristics (i.e., risk of bias, heterogeneity, generalizability, precision, and publication bias), and to examine how the inclusion of smaller sample size studies, defined in various ways, and quality characteristics influence the interpretation of the size and precision of the effect estimates in a large systematic review.

Methods This study will examine data from >400 trials included in the Cochrane review, “Exercise therapy for chronic low back pain”. We will describe trial and review characteristics, and investigate the relationship between included trial sample size and quality characteristics. Risk of bias will be assessed with the Cochrane Risk of Bias tool. We will explore sample size related to contributed statistical and clinical heterogeneity, generalizability of synthesized results, precision of effect estimates, and potential publication bias assessed using funnel plots and Egger’s test. We will conduct meta-analyses in homogeneous subgroups of trials to examine the influence of sample size of included studies on the interpretation of synthesis results. We will then use simulation analyses modifying sample size and other characteristics to explore how these results may generalize to other systematic reviews.

Session ID: A4.1, Social Determinants of Health

Transitioning to a guaranteed annual income and the impact on health in older adults: evidence from Canadian public pensions

Presented by: Daniel Dutton

All Authors: Daniel Dutton¹

Author Affiliations: ¹Dalhousie University

Abstract

Objectives: To determine the health impact of transitioning to a public pension for low-income individuals.

Health impact is measured as changes in ability to participate in activities of daily living (ADLs).

Methods: Our study uses data from the Canadian Longitudinal Study on Aging (CLSA), a large national survey that follows approximately 51,000 older adults (age 45-85 at recruitment) until 2023 or death. We use data from baseline (2010-2015) and the first follow-up wave (2015-2018). We observe three discrete groups: those who are collecting a pension at both time periods, those who are not collecting a pension in either time period, and those who collect a pension at follow-up but not at baseline (i.e., transition onto a pension). We model improvement and deterioration in ADLs with logistic regression for males and females. We adjust for income, home ownership, age, presence of chronic disease, year, province and account for the differential impact of the pension based on income through an interaction term. We stratify our analysis by sex, weights are used throughout. Our sample is 34,596 individuals at baseline and follow-up. Our models are run separately for males and females. We run all models in Stata 15. **Results:** Low-income earners at baseline who transition to a pension were between 10 and 15 percentage points less likely to experience a deterioration in ADLs. The impact of the transition become statistically insignificant at higher levels of baseline income.

Conclusion: These improvements are approximately equal to moving from a salary lower than \$50,000 per annum to over \$100,000 in the non-pension receiving group. The pensions we analyze are not close to a \$50,000 increase in income, the income floor of pensions are just over \$20,000. Targeted income supplementation has the power to improve health greatly among those who have very low incomes.

Session ID: A4.2, Social Determinants of Health

Determinants of Socioeconomic Inequalities in Wellbeing in Canada: Evidence for Nova Scotia Quality of Life Survey

Presented by: Daniel Keays

All Authors: Daniel Keays¹, Mohammad Hajizadeh²

Author Affiliations: ¹Saint Mary's University, ²Dalhousie University

Abstract

Objectives: A growing body of literature in both social and public health sciences is focused on investigating the influence of socioeconomic status on the overall wellbeing of populations. However, a limited number of studies have quantified and explained the socioeconomic inequalities observed in the well-being of populations. Using a unique information available in the 2019 Nova Scotia Quality of Life Survey (NSQL, n=12,871), this study provides a comprehensive analysis of the determinant of socioeconomic inequalities in wellbeing in Nova Scotia, Canada. **Methods:** The population's wellbeing was measured using the Canadian Index of Wellbeing (CIW), which encompasses quality of life across eight domains: community vitality, democratic engagement, education, environment, healthy populations, leisure and culture, living standards, and time use. The Concentration index approach were used to measure and explain socioeconomic inequalities in wellbeing. The Concentration index approach was utilized to quantify and identify factors explaining socioeconomic inequality in wellbeing. **Results:** The positive value of the Concentration index (0.031, 95% confidence interval: 0.029-0.034) showed a substantial socioeconomic inequalities in wellbeing amongst residents of Nova Scotia. The results of the decomposition analysis indicated that, throughout the province, the concentration of favorable mental health, education levels, and income among high socioeconomic status groups accounted for over 80% of the observed socioeconomic inequality in the population's well-being.

Conclusion: Our findings demonstrated that inequalities in mental health, education, and income are significant obstacles to reducing inequality in wellbeing in Nova Scotia. Specifically, our study indicated that policies aimed at alleviating mental health problems among socioeconomically disadvantaged groups in Nova Scotia may help to diminish socioeconomic inequality in wellbeing.

Session ID: A4.3, Social Determinants of Health

Loneliness and Polypharmacy in Older Adults: A cross-sectional analysis of the Canadian Longitudinal Study of Aging (CLSA)

Presented by: Michael Di Paolo

All Authors: Michael T. Di Paolo¹, Jennifer A. Watt², Amy YX Yu³, Sharon E. Straus², Moira K. Kapral⁴, Manav Vyas³

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Abstract

Objective: To evaluate the association between loneliness and polypharmacy in older Canadians aged 65 years or older. We investigate the relationship between loneliness, defined as a lack of social connections, and polypharmacy, defined as taking 5 or more medications, which has been linked to an increased risk of death.

Methods: We conducted a cross-sectional study of 12,565 adults aged 65 years or older from the comprehensive cohort of the Canadian Longitudinal Study on Aging (CLSA). Loneliness was measured using the Center for Epidemiologic Studies depression scale. Polypharmacy was defined as taking five or more prescribed medications. To assess the relationship between loneliness and polypharmacy, we used multivariable logistic regression models adjusting for demographics (age, sex, marital status, living arrangements, education, income, and ethnicity), lifestyle (smoking, alcohol, and BMI), mental health conditions (anxiety and mood disorders), and chronic conditions (intensity of pain/discomfort and 33 chronic conditions, such as cardiovascular and respiratory conditions). **Results:** Of the included 12,565 people aged 65 years or older from the comprehensive cohort of the CLSA, 1,508 (12.0%) were classified as lonely and 7,357 (58.1%) had polypharmacy. Lonely older adults had a higher unadjusted odds of polypharmacy compared to those who were not lonely (63.1% vs. 57.3%, odds ratio 1.49, 95% confidence interval 1.38-1.60). We will undertake the multivariable regression analyses next.

Conclusion: Our study found a significant unadjusted association between loneliness and polypharmacy in older Canadians. Healthcare providers should consider screening for loneliness and intervening with medication reconciliation methods to avoid the adverse and attendant effects of polypharmacy. This study highlights the need for further research to understand the impact of loneliness on the health of older adults and to develop effective interventions to address this issue.

Session ID: A4.4, Social Determinants of Health

Trends in hospital coding for people experiencing homelessness, 2015-2021, Canada: a descriptive study

Presented by: *Eric De Prophetis*

All Authors: Eric De Prophetis¹, Kinsey Beck¹, Diana Ridgeway¹, Junior Chuang¹, Lucie Richard^{2, 3}, Anna Durbin³, Maegan Mazereeuw¹, Geoff Hynes¹, Keith Denny¹

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Abstract

Objectives People experiencing homelessness (PEH) have complex health needs exacerbated by barriers accessing care. As a result, PEH are likely to be frequent users of hospital care. Canada has national acute care databases that capture information on homelessness status, which became mandatory to code in 2018. The primary objective was to describe the use of a homelessness diagnosis code in the hospital setting. Our secondary objective was to describe the characteristics of PEH accessing care as identified with this code.

Methods We measured the frequency and proportion of hospitalizations from PEH in the Discharge Abstract Database (DAD) from 2015 to 2020, using the ICD-10-CA code Z59.0 Homelessness. Trends were examined by province and territory (PT) and groups of census subdivisions. Logistic regression models were used to quantify the impact of the mandate on coding Z59.0 and its regional variation. Descriptive analysis included disaggregation by age, recorded sex/gender, discharge status, and primary diagnosis. **Results** The frequency of hospitalizations with a Z59.0 code increased after the mandate. In 2020, 22,688 hospitalizations (0.48%) across Canada had a Z59.0 code, which is up from 6,162 (0.13%) in 2015. The odds of PEH identification increased by 60% (OR 1.59) immediately following the mandate with variation by PT. Odds more than quadrupled in Ontario (OR 4.29) while odds decreased in British Columbia (OR 0.876). PEH were predominantly males ages 20 to 49. Among PEH patients, 19% left against medical advice, suggesting a potential lost opportunity for intervention. Substance use was also prominent, with 23% of hospitalizations indicated a primary diagnosis of substance-related disorder.

Conclusion The enhanced use of a standard code for homelessness in hospital settings facilitates performance measurement and quality improvement of care for people experiencing homelessness. This is the first description of the national utilization of the Z59.0 homeless code since the 2018 mandate.

Session ID: A4.5, Social Determinants of Health

Community Outbreak of Invasive *Haemophilus Influenzae* type B among Adults Experiencing Unstable Housing in Island Health, British Columbia

Presented by: Andrea Nwosu

All Authors: Andrea Nwosu^{1, 2}, Allison Griffiths², Island Health Communicable Disease Program², Island Health Public Health Outreach Team², Michael Benusic², Dee Hoyano², Pamela Kibsey², Angela Reid², Maritia Gully², Monika Naus³, Katherine Twohig³, James Zlosnik

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Abstract

Objectives: In British Columbia (BC), Invasive *Haemophilus influenzae* type b (Hib) is a rarely reported disease, specifically in Island Health Authority: only four cases were identified from 2010-2021. Community-based outbreaks of Hib in adult populations have not been reported in the literature nor experienced in BC. We report on the investigation of an outbreak of Hib in Island Health and the public health measures implemented to manage it.

Methods: We investigated and described all cases of Hib with a laboratory confirmed diagnosis after December 1, 2021. We analyzed social networks, case risk factors and severity and whole genome sequencing results to inform outbreak management. **Preliminary Results:** As of January 31, 2023, nine cases have been reported. The median age was 42 years, range 27-72 years, and 78% were male. All cases reported using substances and 89% were unstably housed. Eighty-nine percent of cases were hospitalized and one died. All cases were typed as ST-231. Outbreak management involved contact tracing, chemoprophylaxis and immunoprophylaxis of close contacts, and targeted respiratory infection vaccination within communities where cases were detected. Thirteen close contacts were identified; 92% accepted chemoprophylaxis and 46% accepted immunoprophylaxis. Hib conjugate vaccine was administered to 489 people of an estimated population size of 1500 (~33% uptake), with a concurrent administration rate of 64% for pneumococcal, 45% for influenza, and 39% for COVID-19 vaccination.

Conclusion/Next Steps: This outbreak is associated with a clonal strain of Hib and transmission among those experiencing unstable housing. The precise reasons for its emergence is unknown. The outbreak response led to a revision of the Provincial Communicable Disease Control Manual to consider the use of Hib vaccine for outbreaks among community-based adults. An evaluation of the effectiveness of this vaccination campaign is planned to inform best practices for reaching underhoused populations with vaccination in an outbreak response.

Session ID: A5.1, Cancer Epidemiology (I)

Examining the Future of Cancer Impact in Alberta: Projections and Trends 2020-2040

Presented by: Chantelle Carbonell

All Authors: Darren R. Brenner¹, Chantelle Carbonell¹, Dylan E. O'Sullivan¹, Yibing Ruan¹, Robert B. Basmadjian¹, Tara Bond², Angela Estey², Anna Pujadas Botey^{2, 3}, Paula J. Robson^{2, 3, 4}

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Abstract

Objectives: The Future of Cancer Impact (FOCI) report summarizes the current landscape as well as future challenges and opportunities for cancer care in Alberta. A key component of FOCI was a series of projections and analyses of future cancer incidence, prevalence, mortality, survival, and cancer management costs in Alberta from 2020-2040.

Methods: Cancer incidence, mortality, and prevalence data used for projections were obtained from the Alberta Cancer Registry and the Surveillance & Reporting group within Cancer Care Alberta, Alberta Health Services. Cancer incidence and mortality data from 1998 to 2018 and cancer prevalence data from 2000 to 2019 by cancer site, sex, and five-year age group were used. Future incidence, mortality, and prevalence rates were estimated to 2040 using the Canproj statistical package in R. The All Cancers Model of the OncoSim microsimulation tool was used to estimate the direct cancer management costs. **Results:** The overall number of incident cancer cases in Alberta is projected to increase by 29% by 2030 and 56% by 2040. From 2000 to 2019, the one-year prevalence of all cancers in Alberta increased by 85% from 9,627 to 17,810. Alberta's overall number of deaths from cancer is projected to increase by 21% by 2030 and 49% by 2040. The overall direct cost of cancer management is estimated to increase from \$1.5B in 2020 to \$2.3B in 2040.

Conclusion: The impact of cancer in Alberta is expected to grow considerably, largely driven by population growth and aging. FOCI provides a solid foundation to support planning by multiple stakeholders, with the goal of preparing Alberta's cancer care system to meet future challenges. Alberta has many strengths which may be leveraged proactively to ensure continued delivery of safe and high-quality care across the cancer continuum, even in the face of steady increases in incidence and survival.

Session ID: A5.2, Cancer Epidemiology (I)

Site-specific cancer incidence rates by race and immigration status in Canada, 2006-2015: a population-based study

Presented by: Talía Malagón

All Authors: Talía Malagón¹, Samatha Morais¹, Parker Tope¹, Mariam El-Zein¹, Eduardo Franco¹

Author Affiliations: ¹McGill University

Abstract

IntroductionThe Canadian Cancer Registry does not collect demographic data beyond age and sex, making it hard to monitor socioeconomic inequalities in cancer incidence in Canada. We used data linkage to estimate site-specific disaggregated incidence rates by race.

MethodsWe used data from the CanCHEC 2006 and 2011 cohorts, which are population-based probabilistically linked datasets of 5.9 million respondents of the 2006 Canadian long-form census and 6.5 million respondents of the 2011 National Household Survey. Respondents' Indigenous identity and race were self-reported. Respondent data were linked with the Canadian Cancer Registry up to 2015. We calculated age-standardized incidence rate ratios (ASIRR), comparing group-specific rates to the overall population rate with bootstrapped 95% confidence intervals (95%CI). We used negative binomial regressions to adjust rates for socioeconomic variables and assess interactions with immigration status.**Results**The age-standardized overall cancer incidence rate was lower in almost all non-White racial groups than in the overall population, except for White and Indigenous peoples who had higher incidence rates than the overall population (ASIRRs 1.03-1.04). Immigrants had substantially lower age-standardized overall cancer incidence rates than non-immigrants (ASIRR 0.83, 95%CI 0.82-0.84). Stomach, liver, and thyroid cancers and multiple myelomas were the sites where most non-White racial groups had consistently higher site-specific cancer incidence rates than the overall population, while for other cancers incidence rates were higher in White individuals. Differences between races remained after adjustment for sex, income, education, urbanicity, and province of residence. Immigration status was an important modifier of cancer risk in the interaction model.

ConclusionsDifferences in cancer incidence between racial groups in Canada are likely influenced by differences in lifestyles, early life exposures, a healthy immigrant effect, and enduring legacies of colonialism. Results suggest there are still important gains that could be made in cancer prevention related to modifiable risk factors.

Session ID: A5.3, Cancer Epidemiology (I)

Differences in site-specific cancer incidence by individual- and area-level income in Canada from 2006-2015

Presented by: Parker Tope

All Authors: Parker Tope¹, Samantha Morais¹, Mariam El-Zein¹, Eduardo Franco¹, Talía Malagón¹

Author Affiliations: ¹Division of Cancer Epidemiology, McGill University, Montreal, QC, Canada

Abstract

Objectives: Income, a component of socioeconomic status, influences cancer risk as a social determinant of health. We evaluated the independent associations between individual- and area-level income, and site-specific cancer incidence in Canada.

Methods: We used data from the 2006 and 2011 Canadian Census Health and Environment Cohorts, which are probabilistically linked datasets constituted by 5.9 million and 6.5 million respondents of the 2006 Canadian long-form census and 2011 National Household Survey, respectively. Individuals were linked to the Canadian Cancer Registry through 2015. Individual-level income quintiles were derived using after-tax household income adjusted for household size. Annual tax return postal codes were used to assign place of residence and area-level income quintiles to individuals for each year of follow-up. We calculated age-standardized incidence rates (ASIR) and rate ratios for cancers overall and by site. We conducted multivariable negative binomial regression to assess independent associations between rates and individual- and area-level income, and adjust for sex, race, education, occupation, urbanicity, and province of residence. **Results:** Overall cancer ASIRs decreased with increasing individual- and area-level income. Individuals of lower individual- and area-level income had significantly higher ASIRs compared to those in the wealthiest income quintile for head and neck, oropharyngeal, esophageal, stomach, colorectal, anal, liver, pancreas, lung, cervical, and kidney and renal pelvis cancers. Conversely, individuals of wealthier individual- and area-level income had significantly higher ASIRs for melanoma, leukemia, Hodgkin's lymphoma, non-Hodgkin's lymphoma, breast, uterine, prostate, and testicular cancers. After mutually adjusting for individual- and area-level income, and other socioeconomic and demographic factors, the independent associations between both income measures, and cancer incidence remained significant for most sites.

Conclusion: Although Canada's publicly funded healthcare system provides universal coverage, inequalities in cancer incidence persist across both income gradients. Our estimates suggest that individual- and area-level income impact cancer incidence through independent mechanisms.

Session ID: A5.4, Cancer Epidemiology (I)

Age- and histology-specific testicular cancer incidence trends in Canada

Presented by: Dylan O'Sullivan

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Abstract

Objectives: Testicular cancer is the most common malignancy among men aged 15-44 in Canada. The incidence of testicular cancer in Canada has been increasing steadily since at least the early 1980s, yet the causes of this increase remain unknown. The aim of this study was to determine if the trends in the incidence of testicular cancer vary by age and histology.

Methods: Testicular cancer incidence data were obtained from the Canadian Cancer Registry (1992-2019). The province of Quebec was excluded because incidence data were missing from 2011-2019. Annual percentage changes (APC) in the incidence rates of testicular cancer were estimated using JoinPoint regression. Analyses were conducted overall and stratified by histology (seminoma vs. non-seminoma) and age (15-29, 30-39, 40-49) simultaneously. **Results:** Between 1992 and 2019, the incidence rates of testicular cancer significantly increased with an APC of 1.2. Incidence trends varied by histology with an APC of 2.0 for seminomas, while trends were less consistent for non-seminomas with a significant APC of 2.4 between 1992 and 2014, but an APC not significantly different from zero thereafter. Over the more recent years, the incidence rate of seminomas increased significantly for the older age groups (APC=3.0 between 2001 and 2019 for the 30-39 and APC=8.2 between 2015 and 2019 for the 40-49 age groups). Among men aged 15-29 the incidence rates of non-seminomas increased significantly from 1992 to 2014 (APC = 2.3) and then significantly decreased until 2019 (APC = -5.6). In contrast, the incidence rates of non-seminomas have consistently increased from 1992 to 2019 among men 30-39 (APC = 1.4).

Conclusion: Testicular cancer incidence rates continue to increase, and the disease has a considerable impact on young Canadian men. Differences in incidence trends by age and histology indicate multiple etiologic factors could be responsible. Studies examining novel risk factors for testicular cancer are required.

Session ID: A5.5, Cancer Epidemiology (I)

Risk of subsequent primary cancers among cancer survivors in Alberta

Presented by: Matt Warkentin

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Abstract

Objectives: Improvements in early detection and clinical management of cancers has resulted in an increased number of long-term cancer survivors who may be at an increased risk of developing a subsequent primary cancer (SPC) at a different site. The objective of this study was to estimate the risk of SPC development among cancer survivors in Alberta.

Methods: We used data from the Alberta Cancer Registry (ACR) to identify all first primary cancers (FPC) occurring between 2004 and 2015. SPC were considered as the next primary cancer occurring after the FPC in a different site. Follow-up was defined as six months from FPC diagnosis until the SPC diagnosis date (if one occurred), 2020-12-31, or the last known date, whichever came first. We estimated incidence rates and standardized incidence ratios (SIR) for SPC development with 95% confidence intervals (CI). SIR was estimated as the observed number of SPC (O) divided by the expected number of SPC (E), where E is a weighted-sum of the population-based year-age-sex-specific incidence rates and the corresponding person-years follow-up in the ACR. **Results:** There were 12,497 SPC and 820,991 person-years of follow-up among 128,420 cancer survivors. Cancer survivors had a higher risk of developing a different-site cancer compared to the general population (SIR=1.24, 95% CI: 1.21-1.26). The increase in risk was stronger for females (SIR=1.35, 95% CI: 1.31-1.39) than males (SIR=1.17, 95% CI: 1.14-1.19). Common FPC sites including female breast, prostate, colorectal, and lung had relative risks of 1.06 (95% CI: 1.01-1.11), 0.84 (95% CI: 0.81-0.87), 1.07 (95% CI: 1.01-1.13), and 1.14 (95% CI: 1.04-1.24), respectively.

Conclusion: Cancer survivors have an increased risk of developing cancers at a new site compared to the risk in the general population. These findings suggest that cancer survivors may require increased surveillance after a FPC to mitigate morbidity and mortality from SPC.

Session ID: B1.1, Mental Health and Substance Use (COVID)

Youth and Family COVID-19 Health Literacy: Multi-informant National Interviews with Parent-Child Dyads in Canada to Develop Mental Health Campaigns

Presented by: Hannah Brown

All Authors: Hannah Brown¹, Stephana Julia Moss¹, Cynthia Sriskandarajah¹, Sara Mizen¹, Eric McArthur², Sofia Ahmed³, Kathryn Birnie³, Donna Halperin⁴, Scott Halperin¹, Micaela Harley⁵, Jia Hu³, Josh Ng Kamstra⁶, Laura Leppan¹, Angie Nickel¹, Nicole Racine⁷, Kristine

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Abstract

Objectives The objective of this study was to gain a deeper understanding of system-level planning that may be important to facilitate effective mental health campaigns and efficient use and development of mental health resources in COVID-19 and future health crises.

Methods We conducted 1-1, 60-minute, semi-structured virtual interviews from June 2022 to September 2022 across 10 provinces in Canada with dyads of children (11-14yr) or youth (15-18yr) and their parent (>18yr). We purposively sampled a demographically diverse group of dyad participants using a maximum variation sampling technique who completed the quantitative component of this larger mixed-methods study. Interviews centered on asking participants about the sources of information accessed related to mental health. Interviews were audio-recorded, transcribed, and de-identified, and inductive thematic analysis was performed independently and in duplicate according to published methods. **Preliminary Results** The data from 32 interviews (16 dyads) resulted in three preliminary themes: (1) lack of confidence in mental health knowledge acquisition; (2) healthcare professionals as conduits for accurate and valid information; and (3) empowering children and youth to decide their own health views. Dyads recommended school or community healthcare education may be an accessible method for healthcare professionals to promote mental health to students as children and youth are less likely to exist within pre-established relationships. Recommendations for child and youth friendly practices included empathetic and friendly staff, offering flexible hours, using appropriate communication skills such as providing complex information in engaging, easy-to-understand language, and conveying health information that supports learning,

Conclusions Researchers, policymakers and public health practitioners have a unique opportunity to address disparities in mental health knowledge acquisition among children and youth. Ongoing surveillance of mental health as well as system-level planning are important to facilitate effective mental health campaigns and efficient use and development of mental health resources in periods of health crisis.

Session ID: B1.2, Mental Health and Substance Use (COVID)

The Impact of COVID-19 on Mental Health Symptoms of Families: Results from a Multi-informant National Survey of Parent-Child Dyads in Canada

Presented by: Stephana Julia Moss

All Authors: Stephana Julia Moss¹, Cynthia Sriskandarajah¹, Eric McArthur², Sofia Ahmed³, Kathryn Birnie³, Donna Halperin⁴, Scott Halperin¹, Micaela Harley⁵, Jia Hu³, Josh Ng Kamstra⁶, Laura Leppan¹, Angie Nickel¹, Nicole Racine⁷, Kristine Russell¹, Stacie Smith⁸, May

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Abstract

Objectives The COVID-19 pandemic negatively impacted mental health of children, youth, and their families which must be addressed and prevented in future public health crises. The objective of this work was to measure how self-reported mental health symptoms of children/youth and their parents changed during COVID-19.

Methods We conducted a nationally representative, multi-informant cross-sectional survey, administered online to collect data from April-May 2022 across 10 provinces in Canada among dyads of children (11-14yr) or youth (15-18yr) and a parent (>18yr). Self-report mental health questions were based on The Partnership for Maternal, Newborn & Child Health and the World Health Organization of the United Nations H6+ Technical Working Group on Adolescent Health and Well-Being consensus framework and the Coronavirus Health and Impact Survey.

McNemar's test and the test of homogeneity of stratum effects were used to assess differences between children/youth and their parents and potential interaction by stratification factors, respectively. **Results** Among 933 dyads (N=1,866), 349 (37.4%) parents were 35-44yr and 485 (52.0%) parents were women; 227 (47.0%) children and 204 (45.3%) youth were girls; 174 (18.6%) dyads resided in Canada for <10yr. Anxiety and irritability were reported frequently among child (44, 9.1%; 37, 7.7%) and parent (82, 17.0%; 67, 13.9%) dyads, and youth (44, 9.8%; 35, 7.8%) and parent (68, 15.1%; 49, 10.9%) dyads; children and youth were less likely to report worsened anxiety ($p<0.001$, $p=0.006$, respectively) or inattention ($p<0.001$, $p=0.028$, respectively) compared to their parents. Dyads reporting financial or housing instability or self-identified as a person living with a disability more frequently reported worsened mental health.

Conclusions These findings quantify and contextualize pandemic-related changes to self-reported mental health symptoms of children, youth, and their families. Understanding patterns of mental health and factors associated with changes are essential to ensure that services match the needs of the population served.

Session ID: B1.3, Mental Health and Substance Use (COVID)

Dual experience of self-reported mental health symptoms and problematic substance use during the first two years of COVID-19 pandemic among Canadian adults: evidence from a repeated nationwide cross-sectional survey

Presented by: Md Sabbir Ahmed

All Authors: Md Sabbir Ahmed¹, Mary Bartram², Robert Gabrys³, Mansfield Mela⁴, Nazeem Muhajarine¹

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Abstract

Objective: To identify the prevalence of dual experience, mental health symptoms and problematic substance use, and its associated factors among Canadians during the COVID-19 pandemic.

Methods: This study comprised 14,897 Canadians who completed an online survey via Leger's online panel. This study consisted of ten waves of data collected between Oct 2020 and Mar 2022. In this study, dual experience was defined as mild to severe symptoms of depression and/or anxiety AND meeting screening criteria for problematic cannabis and/or alcohol use. Multivariable logistic regression models were fitted to identify the associated factors. Stata (v14.2) was used to perform the analysis. Sampling weight was used to ensure the sample representation, nationally, as of 2016 census. **Results:** The prevalence of dual experience was 17.12%; about 45.54% of the participants reported at least one (mental health symptoms/problematic substance use) experience. Although the highest prevalence of dual experience was reported early in the pandemic (October 2020), 47.01%, in subsequent data waves the prevalence showed a marked downward trend. Among the provinces, the highest prevalence was reported in Saskatchewan (19.4%). Multinomial logistic regression analysis using pooled data showed that age, gender, 2SLGBTQ+ identity, self-reported ethnocultural minority status, diagnostic history of mental health and substance use disorder, suicidal ideation, and ability to handle unexpected/difficult situation were significantly associated with dual experience of mental health symptoms and problematic substance use during COVID-19 pandemic in Canada. These factors were also significantly associated with at least one experience of poor mental health or problematic substance use.

Conclusion: This analysis showed that the COVID-19 pandemic impacted mental health and problematic substance use in significant and interrelated ways. Data-driven province-specific interventions might be helpful toward a client-centered and integrated mental health and substance use care system in Canada.

Session ID: B1.4, Mental Health and Substance Use (COVID)

A longitudinal investigation of employment status and depression during the early phases of the COVID-19 pandemic: Findings from the Canadian Longitudinal Study on Aging (CLSA)

Presented by: Brianna Frangione

All Authors: Brianna Frangione¹, Ying Jiang², Margaret de Groh², Esme Fuller-Thomson³, Paul Villeneuve¹

Author Affiliations: ¹Carleton University, ²Public Health Agency of Canada, ³University of Toronto

Abstract

Introduction: The COVID-19 pandemic resulted in increased risks for mental health issues. Employment status is an important social determinant of health and, for some, a critical component of social identity. In this study, we sought to examine if trajectories related to depression during the COVID-19 pandemic varied across employment status (employed, unemployed, retired).

Methods: The study population included 20,181 participants of the Canadian Longitudinal Study on Aging (CLSA) who provided data at follow-up one (2015–2018) and twice during the pandemic (Spring 2020 and Autumn 2020). Participants were 45 years of age or older at the time of the initial survey (2010–2015). The Center for Epidemiologic Studies Depression Scale (CES-D-10) was used to classify individuals with depression (CES-D-10 score >10). Employment status was collected during the Autumn 2020 survey. Logistic regression was used to estimate the odds of incident depression during COVID-19. **Results:** There were increases in the mean CES-D-10 scores from follow-up one to Autumn 2020 across most subgroups. In adjusted models, there was an 89% (OR=1.89; 95% CI: 1.38 – 2.58) increased odds of developing depression for unemployed individuals compared to full-time workers in Autumn 2020. Among employed respondents, there was a 21% (OR=0.79; 95% CI: 0.67 – 0.95) reduced odds of developing depression for those working outside of the home compared to those working from home. Furthermore, being an essential worker in Spring 2020 resulted in a 19% (OR=0.81; 95% CI: 0.69 – 0.94) reduced odds of developing depression compared to non-essential workers. We are currently exploring predictors of depression during COVID-19 among those who were retired.

Conclusion: These findings suggest differences in depression trajectories among older adults based on employment status and that those working outside the home have a lower risk of developing depression. Public health interventions should address work locations as potential mitigating factors to depression incidence.

Session ID: B1.5, Mental Health and Substance Use (COVID)

Mental health and addictions history and severe SARS-CoV-2 outcomes: A population-based study in Ontario, Canada

Presented by: Michael Lebenbaum

All Authors: Paul Kurdyak^{1, 2}, Michael Lebenbaum³, Hong Lu², Laura Rivera¹, Damon Scales^{1, 2}, Astrid Guttman^{1, 2}

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Abstract

Objectives: Individuals with pre-existing mental health conditions are at greater risk of severe COVID-19 related outcomes. However, many studies to date have restricted samples to individual's who have tested positive or are hospitalized for COVID-19 increasing risk of collider bias, have not considered vaccination status, and very few studies have been conducted among Canadian individuals. Therefore, the objective of this study was to examine the association between mental health conditions and severe COVID-19 outcomes.

Methods: Using linked health administrative data, we created a cohort of all Ontario non-long-term care residents aged ≥ 19 as of January 1, 2020 (index) followed until October 31, 2021. Outpatient, emergency department and hospitalization records were used to identify mental health conditions within 5 years prior to index. We conducted Cox-Proportional Hazards to examine the association between mental health diagnoses and severe COVID-19 outcomes (i.e., COVID-19 hospitalization and a ICU admission/death composite) adjusting sequentially for 1) demographic characteristics, comorbidity, 2) socioeconomic status, and 3) time-varying COVID-19 vaccination. **Results:** The strong demographic-comorbidity adjusted associations between psychotic disorders and COVID-19 hospitalization (Hazard Ratio (HR): 2.05) and ICU admissions/deaths (HR: 2.01) were highly attenuated after control for socioeconomic status (hospitalization HR: 1.47, ICU/death HR: 1.58) but minimally changed after adjustment for COVID-19 vaccination (hospitalization HR: 1.45, ICU/death HR: 1.55) (all $p < 0.001$). Similar results were found for substance use disorders (1) demographic-comorbidity hospital HR: 1.74, ICU admissions/deaths HR: 1.61; 2) + socioeconomic status: hospitalization HR: 1.37, ICU/death HR: 1.35; 3) + COVID-19 vaccination: hospitalization HR: 1.35, ICU/death HR: 1.33) (all $p < 0.001$).

Conclusions: Individuals with psychotic and substance disorders are at much greater risk of severe COVID-19 outcomes, relative to individuals without a history of mental health care. These associations were partially explained by lower socioeconomic status but not by lower levels of COVID-19 vaccination.

Session ID: B2.1, Health Behaviours

Examining sport participation by gender identity among Canadian youth: A cross-sectional analysis using COMPASS data

Presented by: McKenna Szczepanowski

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Abstract

Objectives: Physical activity (PA) is known to be associated with a plethora of positive health outcomes, while engagement in sports programming is known to be positively associated with PA. It has been demonstrated that youth PA is decreasing and organized sports may be an avenue to increase adherence; however, there is paucity in the research surrounding participation rates and environment for a marginalized group, known as gender-minority youth (GMY). Thus, the objective of this research is to determine the prevalence of intramural, varsity and community-based organized sport participation based on gender identity and identify potential protective and risk factors for sport participation among youth aged 12-17 years.

Methods: Data from Year 10 (2020-2021) of the COMPASS study, which is an ongoing school-based prospective cohort study of adolescents, will be used for this research. Student level descriptive statistics for the full sample and by gender (cisgender and GMY) will be calculated. Descriptive statistics for sports participation and covariates by gender will also be calculated. Differences for prevalence estimates will be assessed using chi-square tests for proportions and independent sample t-tests for means. Generalized estimated equations logistics models will be used to examine associations between gender and participation in organized sports. All models will control for demographic covariates, bullying, discrimination, school connectedness, and home life. **Results:** Preliminary results indicate that GMY are less likely to participate in organized sports both at school and within the community. Models investigating various covariates that may be protective or risk factors for GMY sport participation engagement have yet to be analyzed. **Next Steps:** Organized sport contexts and environments should be modified to encourage GMY participation in a variety of settings. Efforts to alleviate barriers to sport participation for GMY may be in the form of increasing social support, education, awareness and implementing or adapting school policies.

Session ID: B2.2, Health Behaviours

Examining the association between cannabis use and SWEAT recommendation adherence of Canada's 24-Hour Movement Guideline for Children and Youth: A longitudinal analysis of COMPASS data

Presented by: McKenna Szczepanowski

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Abstract

Objectives: The moderate-to-vigorous physical activity (SWEAT) recommendation from the Canadian 24-Hour Movement Guidelines for Children and Youth (5-17 years) is comprised of: a) ≥ 60 minutes of moderate-to-vigorous physical activity per day, b) ≥ 3 days of vigorous physical activity, and c) ≥ 3 days of muscle/bone strengthening exercises. With recent evidence suggesting that physical activity among youth is decreasing and cannabis use is increasing following its legalization, this study examined whether changes in cannabis use frequency were associated with adherence to the SWEAT recommendation over time within a large sample of Canadian youth.

Methods: The study used data from the COMPASS Study, a school-based prospective cohort study of secondary school students in Canada. Linked survey data from 7400 secondary school students in 75 schools participating in years 5-7 (2016/17-2018/19) were analyzed using longitudinal generalized estimating equations (GEE) models to examine changes over time in cannabis use and SWEAT recommendation adherence. **Results:** No association was observed between changes in cannabis use and SWEAT recommendation adherence over time. However, the odds of meeting the recommendation at follow-up were 2.07 times higher among male students, 1.35 times higher among current binge drinkers, and 3.59 times higher among students who met the SWEAT recommendations at baseline. The odds of recommendation adherence at follow-up were 0.82 times lower among students who were underweight and 0.63 lower among those who did not report their weight status. **Conclusion:** Cannabis cessation initiatives may not be effective in promoting physical activity over time. Other risk factors that often correlate with cannabis use such as weight status and sex are seen to be associated with physical activity, thus efforts should be directed towards these to promote physical activity guideline adherence. Future research should consider the longitudinal association of cannabis use with the other three facets of the 24-Hour Movement Guidelines.

Session ID: B2.3, Health Behaviours

ACCEPTABILITY OF BUILT ENVIRONMENT INTERVENTIONS AIMED AT PROMOTING HEALTHY EATING AND PHYSICAL ACTIVITY IN URBAN NEIGHBOURHOODS OF SASKATCHEWAN, CANADA

Presented by: Sahana Ramamoorthy

All Authors: Sahana Ramamoorthy¹, Dr. Nazeem Muhajarine¹, Chris Schulz², Dr. Lise Gauvin³

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Abstract

Objectives: a) To estimate the current level of acceptability of a range of built environment (BE) interventions varying in intrusiveness per the Nuffield's intervention ladder that support healthy eating and physical activity in Saskatoon and Regina, b) identify individual- and neighbourhood-level factors associated with acceptability, and c) examine how associations vary for different levels of intervention intrusiveness.

Methods: This study is part of a larger CIHR-funded (FRN #148919) project called "THEPA" (Targeting Healthy Eating & Physical Activity: Citizens' perspectives). THEPA included data on the acceptability of BE interventions from city-dwelling adults across Canada. The data were collected through online and telephone surveys. In addition, the study linked respondents to their neighbourhood-level attributes using Canadian Urban Environmental Health Research Consortium (CANUE) data. A subset of the data constituting a sample of 2133 respondents was analyzed using multilevel logistic regression. The outcomes were 'agreement' to implement BE interventions related to healthy eating (12 items) and physical activity (26 items). Independent variables were individual- and neighbourhood-level factors. **Results:** A higher proportion of respondents (40-55%) strongly agreed with implementing less intrusive interventions; however, there were exceptions within and between levels of intrusiveness. Factors such as gender, Indigenous status, migrant status, educational attainment, income, perceived health, and home tenure were significantly associated with the overall acceptability of BE interventions. The strength of associations significantly varied with increasing levels of intrusiveness. Notably, respondents who were women, Indigenous, or migrants were more likely to indicate acceptability even for BE interventions of higher intrusiveness. No clear associations were found with neighbourhood-level attributes. **Conclusion:** Sociodemographic factors strongly influenced public acceptability, and the degree of support varied for different intrusiveness levels per Nuffield's intervention ladder. This study provides previously lacking evidence on the acceptability of diverse BE interventions, the influence of intervention intrusiveness, and individual-level factors related to acceptability.

Session ID: B2.4, Health Behaviours

Burden of Unhealthy Behaviours on Ontario Period Life Expectancy in 2000-2004, 2005-2009, and 2010-2014

Presented by: Richard Perez

All Authors: Richard Perez^{1, 2, 3}, Claudia Sanmartin⁴, Kevin Brand², Monica Taljaard^{2, 5}, Doug Manuel^{2, 3, 4, 5}

Author Affiliations: 1McMaster University, 2University of Ottawa, 3ICES, 4Statistics Canada, 5Ottawa Hospital Research Institute

Abstract

OBJECTIVES Unhealthy behaviours -- such as smoking, leisure physical inactivity, non-active transport, leisure sedentary activity, and poor diet -- are leading risk factors for mortality. This study estimated the burden of these unhealthy behaviours on Ontario period life expectancy in 2000-2004, 2005-2009, and 2010-2014.

METHODS 40- to 89-year-old Ontario respondents from multiple cycles of the Canadian Community Health Survey were pooled and linked to vital statistics data to ascertain deaths. 5-year predictive risk algorithms were constructed which varied in their level of adjustment, thereby providing a potential range for the causal relationship between each unhealthy behaviour and mortality. These algorithms were calibrated to general population mortality rates in different time periods (2000-2004, 2005-2009, and 2010-2014). Using a cause-deleted approach, the calibrated algorithms were applied to weighted linked Ontario subsamples to generate life tables and corresponding counterfactual tables for each of the time periods. The life years lost to each unhealthy behaviour, and all unhealthy behaviours combined were estimated by time period. **RESULTS** Life years lost to unhealthy behaviours was 7.5 (6.5-8.3) years in 2000-2004, 7.0 (6.1-7.8) years in 2005-2009, and 6.7 (5.8-7.4) years in 2010-2014. This reduction in unhealthy behaviour burden represents over 41% of the period life expectancy gains experienced during this time. In 2009-2014, 25.2% of the burden was attributed to non-active transport, 24.2% to smoking, 20.7% to leisure physical inactivity, 16.2% to poor diet, and 13.7% to leisure sedentary activity.

CONCLUSION The large detrimental effect of unhealthy behaviours on period life expectancy in Ontario has been decreasing over time. Smoking behaviour is now responsible for only about a fifth of the unhealthy behaviour burden. Behaviours associated with physical inactivity and sedentary activity form most of the unhealthy behaviour burden. The burden of poor diet was likely underestimated because diet was only ascertained through frequency intake of fruits and vegetables.

Session ID: B3.1, Biostatistics and Epidemiology (Methods)

Natural effects in the presence of an intermediate confounder: evaluation of three pragmatic estimation strategies with an emphasis on the relationship between natural and interventional effects

Presented by: Geneviève Lefebvre

All Authors: Jesse Gervais¹, Geneviève Lefebvre¹, Erica E. M. Moodie²

Author Affiliations: ¹Université du Québec à Montréal, ²McGill University

Abstract

Objectives Mediation analysis using the so-called natural effects is an essential tool to uncover causal pathways between an exposure and an outcome. However, natural effects are not identified in the presence of an intermediate confounder (L), a situation which arguably arises frequently in practice. Three pragmatic approaches can be used to estimate natural effects when such a confounder L is present: natural effects estimators that omit L, natural effects estimators that consider L as a pre-exposure confounder, or interventional effects estimators. Interventional effects are analogous to natural effects, but remain identified when L is present. The objectives of this work were: 1) to assess the extent to which natural and interventional effects can differ when there exists an intermediate confounder and 2) to investigate the performance of the three aforementioned approaches to estimate natural effects in such a context.

Methods We derived general analytical expressions showing the relationships between natural and interventional effects estimands and assessed the difference between them under a variety of data-generating mechanisms with intermediate confounding. We used Monte Carlo simulations to quantify the biases of the three studied mediation effects estimators for estimating natural effects. **Results** When all the variables but the exposure were Gaussian, we showed that interventional effects reduce to natural effects when there are no interactions involving both L and the mediator in the outcome model. Interventional effect estimators generally outperformed the two other strategies in terms of biases and coverage rates. When all the variables were binary, no estimator completely dominated the others, but only the natural effects estimators that considered L as a pre-exposure confounder had unacceptable biases in some contexts.

Conclusion Globally, using interventional effects estimators for estimating natural effects was found a better analytic strategy than using natural effects estimators that adjusted or not on the intermediate confounder.

Session ID: B3.2, Biostatistics and Epidemiology (Methods)

Advancing difference-in-differences methods for unpoolable data

Presented by: Nichole Austin

All Authors: Nichole Austin¹, Matt Webb², Erin Strumpf³

Author Affiliations: 1Dalhousie University, 2Carleton University, 3McGill University

Abstract

Objectives: Natural experiments and cross-jurisdictional comparative analyses offer valuable opportunities to understand what works - and what doesn't - to improve health and health care. One method frequently used to learn from policy variation is difference-in-differences (DiD) estimation, which is a common and indispensable analytical tool for health policy/health service researchers. However, data sources are often siloed by jurisdiction: for example, administrative data from different provinces often cannot be combined into one dataset for analysis. This is a significant barrier to DiD estimation, and no guidelines currently exist for conducting DiD analyses in these settings. In this project, we describe the validation of a novel approach to DiD which enables cross-jurisdictional comparisons in siloed data contexts. **Methods:** We replicated an existing DiD analysis using nine waves of the Canadian Community Health Survey (CCHS), which is pooled by design. We began by reproducing the original estimates before constructing a "pseudo-siloed" dataset for validation purposes. We then applied our novel DiD approach to this dataset and compared our findings against the published (pooled) estimates to gauge its performance. **Preliminary results:** Our initial results suggest that we can precisely recover traditional/pooled DiD estimates with a weighted combination of the unpooled/siloed estimates and standard errors; a relatively simple extension of this approach allows for the accommodation of covariates. Our full results will feature a comprehensive description of the performance and limitations of this novel method using the CCHS data.

Conclusion: Our work to-date suggests that extensions to DiD models can be successfully developed to accommodate siloed data, which will facilitate cross-jurisdictional comparisons. Future work will include the development of a software package to implement these extensions, an applied user guide to facilitate their use, and the formal evaluation of a health services intervention.

Session ID: B3.3, Biostatistics and Epidemiology (Methods)

The Validity of Electronic Health Data for Measuring Smoking Status: A Scoping Review and Meta-analysis

Presented by: Md Ashiqul Haque

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Abstract

Objectives: Smoking is a risk factor for many chronic diseases. Smoking status ascertainment algorithms have been developed for population-based electronic health databases such as administrative databases. Evidence syntheses of algorithm validation studies have often focused on chronic diseases rather than risk factors. We aimed to conduct a scoping review of smoking algorithms and describe the characteristics and validity of these algorithms.

Methods: The five-step Arksey and O'Malley framework for scoping reviews was adopted. We searched articles published from 1990 to 2022 in MEDLINE, Scopus, EMBASE, and Web of Science with key terms such as validity, administrative data, electronic medical records (EMRs), smoking, and tobacco use. The extracted information, including article characteristics (e.g., country of data origin), algorithm characteristics (e.g., algorithm developed with machine-learning models), and algorithm validity measures (e.g., accuracy), was descriptively analyzed. Sources of heterogeneity in validity measure estimates were estimated using a three-level meta-regression model. **Results:** The initial search yielded 2086 articles; 57 were selected for review and 116 algorithms were identified. Three-quarters (71.6%) of algorithms were based on EMRs. The algorithms were primarily constructed using diagnosis codes for smoking-related conditions, although prescription medication codes and physician service codes were also used. About half of the algorithms were developed using machine-learning models. Algorithm sensitivity, specificity, and accuracy were highly variable and ranged from 3% to 100%, 36% to 100%, and 51% to 100%, respectively. Model-based algorithms had significantly greater accuracy ($p=0.004$) and sensitivity ($p=0.008$) estimates than rule-based algorithms. Algorithms for EMRs had higher sensitivity than algorithms for administrative data ($p=0.002$).

Conclusion: Multiple algorithms using different data sources and methods have been proposed to ascertain smoking status in electronic health data. Many algorithms had low sensitivity and accuracy, but the data source influenced algorithm validity. Algorithms based on machine-learning models for multiple linked data sources can improve validity.

Session ID: B3.4, Biostatistics and Epidemiology (Methods)

Does self-completed life history calendar facilitate the recall of past events?

Presented by: Jennifer Yu

All Authors: Jennifer Yu¹, Prevost Jantchou^{2, 3}, Rui Ning Gong³, Belinda Nicolau⁴, Sreenath Madathil⁴, Marie-Claude Rousseau¹

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Abstract

Objectives Retrospective data collection is subject to recall error, affecting completeness, consistency, and dating accuracy. A life history calendar (LHC) allows for the mapping of personal events to improve participants' recall of past exposures. We estimated whether completing a LHC prevented missing values (MV) and improved agreement of self-reported information with administrative data.

Methods Participants in a case-control study on inflammatory bowel disease were invited to complete a preparatory LHC and encouraged to consult it during data collection. To evaluate MV, 177 variables were selected based on relevance and potential difficulty to recall. We assessed whether LHC preparation and use were associated with the number of MV using negative binomial regression analyses adjusted for sex, case/control status, mode of participation (online/phone), and socioeconomic characteristics. Variables available from the questionnaire and the Quebec Birth Registry were used to assess agreement: age of the participants' father and mother when they were born and number of older siblings. We estimated the odds of agreement in relation to LHC preparation with adjusted logistic regression. **Results** Of 2727 participants, 48% (n=1297) prepared the LHC. During data collection, 27%, 48%, and 25% used it never, sometimes, often/always, respectively. LHC preparation (vs. not) was associated with a 36% decrease in number of MV [sample mean ratio (SMR)= 0.64 (95%CI: 0.53-0.77)]. There were fewer MV with greater usage frequency: SMR= 0.56 (95%CI: 0.43-0.74), 0.46 (95%CI: 0.37-0.58), and 0.34 (95%CI: 0.25-0.47) among those who never, sometimes, often/always used the LHC, respectively. Having completed the LHC was associated with higher odds of agreement between self-reported and registry data for father's (OR=1.44, 95%CI: 1.09-1.92) and mother's age (OR=1.40, 95%CI: 1.04-1.91) at participant's birth, but not for the number of older siblings.

Conclusion LHC preparation and frequent usage during data collection were associated with fewer MV and better agreement with administrative data.

Session ID: B4.1, Access to Care

Impact of COVID-19: Investigating the prevalence of and characteristics associated with unmet needs for rehabilitation services among Canadians living with long-term conditions or disabilities during the first wave of the pandemic.

Presented by: Astrid DeSouza

All Authors: Astrid DeSouza^{1, 2}, Dan Wang^{1, 2}, Jessica J. Wong^{1, 2}, Andrea D. Furlan^{3, 4}, Sheilah Hogg-Johnson^{2, 5}, Luciana Macedo⁶, Silvano Mior^{2, 5}, Pierre Côté^{1, 2}

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Abstract

Objective: To describe the prevalence of and factors associated with unmet rehabilitation needs among a sample of Canadians living with long-term conditions or disabilities during the first wave of the COVID-19 pandemic.

Methods: We analyzed data from the Impacts of COVID-19 on Canadians-Living with Long-Term Conditions and Disabilities, a national cross-sectional survey with 13,487 respondents. Statistics Canada conducted the crowdsourced survey between June 23-July 6, 2020. Eligible participants were Canadian residents with long-term conditions or disabilities, 15 years or older. Unmet needs were defined as needing rehabilitation (i.e., physiotherapy/massage/chiropractic, speech therapy, occupational therapy, counselling services, support groups) but not receiving due to the pandemic. Applying standardized benchmarking factors for each survey respondent, we calculated overall prevalence (95% CI) of unmet rehabilitation needs, and stratified by age, gender, and province/territory. We used multivariable Poisson regression with robust variance estimation to examine the association between demographic, socioeconomic, and health-related characteristics and unmet rehabilitation needs. **Results:** Prevalence of unmet rehabilitation needs among Canadians with long-term conditions or disabilities was 49.3% (95% CI 48.3-50.3). Age-specific prevalence was higher among individuals 15-49 years old (55.6%; 95% CI 54.2-57.1) than those ≥50 years (46.0%; 95% CI 44.5-47.4). Females (53.7%; 95% CI 52.6-54.9) had higher unmet needs than males (44.1%; 95% CI 42.3-45.9). Unmet needs varied across provinces/territories. Our multivariable analysis found females, those residing in Alberta, receiving disability benefits or social assistance, experiencing a decrease in monthly household income, job loss/permanent business closure, increased work hours, decreased earnings, or lower perceived general health or mental health status were more likely to report unmet rehabilitation needs.

Conclusions: In this sample, almost 50% of Canadians living with long-term conditions or disabilities had unmet rehabilitation needs during the first wave of the pandemic. Various demographic, socioeconomic, and health-related characteristics were related to the need for rehabilitation services.

Session ID: B4.2, Access to Care

Are unmet rehabilitation needs associated with health deterioration during the first wave of the COVID-19 pandemic?

Presented by: Dan Wang

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Abstract

Objective: To determine the association between unmet rehabilitation needs and self-perceived health deterioration among Canadians with long-term conditions or disabilities during the first wave of the COVID-19 pandemic.

Methods: We analysed national cross-sectional data collected by Statistics Canada in the survey “Impacts of COVID-19 on Canadians Living with Long-term Conditions and Disabilities”. Crowdsourcing data was collected from June 23-July 6, 2020 through a self-administered online questionnaire. Eligible participants were Canadians aged 15+ years reporting living with long-term conditions or disabilities. We defined unmet rehabilitation needs as needing, but not receiving due to the COVID-19 pandemic, physiotherapy/massage therapy/chiropractic, speech or occupational therapy, counselling or support groups for a long-term condition. Participants who responded “much worse now” or “somewhat worse now” to “Compared to before the COVID-19 pandemic, how would you say your health is now?” were considered to have deterioration in health. We computed adjusted prevalence ratios (aPR) and 95% CI using multivariable Poisson regression with robust variance estimation to quantify the association between unmet rehabilitation needs and health deterioration. We also stratified the analyses by age (15-49/50+ years), gender (male/female), and region (rural/urban). We used standardized benchmarking factors to control for possible selection bias related to age, gender, and province/territory. **Results:** In our sample, 47.4% (6,391/13,483) of Canadians living with long-term conditions or disabilities reported deterioration in health. Among those with health deterioration, 59.2% reported unmet rehabilitation needs due to the pandemic. Adjusting for age, gender, visible minority, province/territory, region, household type, education, employment- and income-related characteristics, those with unmet rehabilitation needs were more likely to report deterioration in health (aPR=1.41, 95%CI 1.35-1.47). The associations were similar in the stratified analyses.

Conclusion: In this sample of Canadians with long-term conditions or disabilities, unmet rehabilitation needs were positively associated with deterioration in health, independent of a wide range of sociodemographic characteristics.

Session ID: B4.3, Access to Care

Maternal disability and access to preventive care: A population-based study

Presented by: Hilary Brown

All Authors: Hilary Brown¹, Andi Camden¹, Yona Lunsky², Maria Santiago³, Kinwah Fung³, Natasha Saunders⁴

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Abstract

Objectives: Preventive care, offered through regular well-baby visits and routine immunizations, is critical for infant health and development. However, even in universal health care systems, some families experience barriers accessing such care. We examined receipt of well-baby visits and routine immunizations in infants of women with physical, sensory, and intellectual/developmental disabilities compared to infants of women without disabilities.

Methods: We undertook a population-based cohort study in Ontario, Canada of all infants of women with physical (n=74,084), sensory (n=26,532), intellectual/developmental (n=1,391), and multiple disabilities (n=5,774), and infants of women without disabilities (n=723,442), born in 2012-2019. Our primary outcomes were receipt of the recommended number of well-baby visits and routine immunizations in the first 2 years of life, as defined by the Canadian Paediatric Society. As secondary outcomes, we examined receipt of the enhanced 18-month developmental assessment, and recommended doses of the diphtheria, tetanus, pertussis, polio, haemophilus influenza type b (DTaP-IPV-Hib) and measles, mumps, and rubella (MMR) immunizations. Groups were compared using modified Poisson regression, with adjustment for maternal socio-demographics, mental health, and infant sex. **Results:** Compared to infants of women without disabilities, infants of women with intellectual/developmental disabilities were less likely to receive the recommended number of well-baby visits (aRR 0.93, 95% CI 0.89-0.98) and routine immunizations (aRR 0.88, 95% CI 0.82-0.92). They were also less likely to receive the enhanced 18-month developmental assessment (aRR 0.93, 95% CI 0.87-0.99), and recommended doses of the DTaP-IPV-Hib (aRR 0.93, 95% CI 0.89-0.97) and MMR immunizations (aRR 0.91, 0.88-0.95). There were no differences for the other disability groups.

Conclusion: These findings signal the need to develop resources to improve access to preventive care for infants of women with intellectual/developmental disabilities, including family-centred supports to overcome barriers identified by mothers and education for health care providers to improve awareness of mothers' accessibility-related needs.

Session ID: B4.4, Access to Care

"We're sinking": A qualitative interview-based study on stakeholder perceptions of structural and process limitations to the Canadian healthcare system

Presented by: Sara Mizen

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Abstract

Background There have been no significant structural changes to Canada's healthcare system since 1963. Reform to the Canadian healthcare system is essential to develop a higher performing system. This study sought to gain a deeper understanding of the views of Canadian stakeholders on structural and process deficiencies and strategies to substantially improve the Canadian healthcare system.

Methods We conducted ~45-minute, semi-structured virtual interviews from May 2022 to August 2022. Using existing contacts and snowball sampling, we targeted one man and one woman from five regions in Canada across four stakeholder groups: (1) public citizens; (2) healthcare leaders; (3) academics; and (4) political decision makers. Interviews centered on participants' perceptions of the state of the current healthcare system, including areas where major improvements are required, and strategies to achieve suggested enhancements; Donabedian's Model (i.e., structure, process, outcomes) was the guiding conceptual framework. Interviews were audio-recorded, transcribed verbatim, and de-identified, and inductive thematic analysis was performed independently and in duplicate according to published methods. **Results** The data from 31 interviews with 13 (41.9%) public citizens, 10 (32.3%) healthcare leaders, 4 (12.9%) academics, and 4 (12.9%) political decision makers resulted in three themes related to the structure of the healthcare system (1. system reactivity; 2. linkage with the Canadian identity; 3. political and funding structures), three themes related to the process of care delivery (1. staffing shortages; 2. inefficient care; 3. inconsistent care), and three opportunities to improve health outcomes (1. delineating roles and revising incentives; 2. enhanced health literacy; 3. interdisciplinary and patient-centred care).

Conclusions Canadians in our sample identified important structural and process limitations to the Canadian healthcare system. Meaningful reforms are needed and will require addressing the link between the Canadian identity and our healthcare system to facilitate effective development and implementation of strategies to improved population health outcomes.

Session ID: B4.5, Access to Care

[Inequities in home care access among older Canadian adults: an intersectionality analysis](#)

Presented by: Afshin Vafaei

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Abstract

Objectives: What research designs best identify characteristics of Canadian older adults who accessed state-funded formal or individually arranged informal care? Does accounting for intersecting characteristics deepen meaning of findings?

Methods: As there is no single quantitative design to assess intersectionality we compared two standard methods. Using the Canadian Longitudinal Study on Aging (CLSA), we performed recursive partitioning regression tree analysis using Chi-Squared automatic interaction detection (CHAID) and multivariate logistic regression to evaluate the impact of socioeconomic (SES), family-related, physical and psychological factors and social/material deprivation on care use. **Results:** Using CHAID, diminished function indicated by Activities of Daily Living (ADL), was most strongly aligned with formal care. Age, living arrangement, having no partner, depression and chronic medical conditions playing a lesser role. Notably, sex/gender, were not determinants. Characteristics aligned with informal care also included country of birth and years since immigration. Both 'trees' showed low risk of misclassification (4.6% and 10.8% for formal and informal care, respectively). Logistic regression models after adjustment for mutual confounding effects mirrored the CHAID findings. For example, limitations in ADL, the first splitter in the trees also showed a high estimated odds of using care (OR=4.4; 95%CI:3.9-4.8).

Conclusions: Our CHAID intersectionality analysis identified nuanced relationships between many factors involved in care use. Although considered marginalized, women, immigrants, or those of lower SES utilized formal care equitably. Need, primarily medical but also arising from living arrangement, rather than SES factors or sex predicted formal care. In this study, intersectional analyses did not enrich findings. Nevertheless, using regression, alone, interconnections between various social locations will be invisible and will, therefore, be missed.

Session ID: B5.1, Lifecourse and Chronic Disease Epidemiology

Chronic disease multimorbidity and associated risk factors by ethnocultural background among Canadian adults

Presented by: Joykrishna Sarkar

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Abstract

Objectives: Multimorbidity, the co-occurrence of two or more chronic health conditions, impacts the health care system, an individual's functional status, and quality of life. Canada is an ethnically diverse country, but differences in multimorbidity across ethnocultural groups has received limited attention. This research estimated the prevalence of multimorbidity and examined the association of multimorbidity with sociodemographic and behavioral risk factors by ethnocultural background.

Methods: The study analyzed data for a nationally representative sample of adults (18+ years) from the Canadian Community Health Survey (CCHS) for 2019 and 2020. Ethnocultural background was based on the question: to which ethnic or cultural groups did your ancestors belong? Presence of multimorbidity (2+ conditions) was based on 16 self-reported chronic conditions. Age-sex adjusted prevalence of multimorbidity with 95% confidence intervals (CIs) was estimated using direct standardization to the Canadian population. Multivariable logistic regression models with two-way interactions between ethnocultural background and risk factors (age, sex, income, education, body mass index [BMI], smoking, alcohol consumption, physical activity, and daily fruits and vegetable consumption) estimated adjusted odds ratio (AOR) and 95% CIs. Data were weighted to obtain population-level estimates and bootstrap weights were applied in statistical testing. **Results:** The study included 94,991 CCHS respondents representing 27,876,003 Canadians; 49.3% were male. Overall multimorbidity prevalence was 32.5% (95% CI: 32.0, 33.1). Multimorbidity prevalence ranged from 24.8% (95% CI: 23.2, 26.5) for East and South Asian respondents to 44.0% (95% CI: 39.8, 48.3) for Indigenous respondents. Higher AORs were associated with older age, female, lower income, lower education, smoking, and higher BMI. Significant interactions ($p < 0.05$) were observed between ethnocultural background and age, BMI, alcohol consumption, and smoking.

Conclusion: Variation in multimorbidity by ethnocultural background may reflect differences in mechanisms of disease co-occurrence and/or differences in the interpretation of questions about chronic conditions.

Session ID: B5.2, Lifecourse and Chronic Disease Epidemiology

Creating a gender index and examining its association with incidence of cardiovascular diseases in men and women: 28-year prospective cohort study

Presented by: Azita Zahiriharsini

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Abstract

Objectives: Cardiovascular diseases (CVD) are the leading cause of morbidity and mortality worldwide. After a CVD, women tend to face poorer prognosis than men. Examining gender (socio-cultural) in addition to sex (biological) differences is required to untangle socio-cultural particularities reflecting either within- or between sex inequities. This study aimed: i) to develop and validate a gender index, and ii) to examine the associations between this gender index, sex and CVD risk factors and incidence.

Methods: 9,188 white-collar women (49.9%) and men from Quebec were recruited in 1991-93 and followed 28-years later. Data collections included a self-administered questionnaire and an extraction of medical-administrative CVD incident cases. Prevalence ratios (PR) of CVD risk factors and 95% confidence intervals were modelled using log-binomial regression. Cox models were used to calculate hazard ratios (HR). **Results:** Fifteen variables were included in the gender index. Sex and gender were partly independent, as discordances were observed in the distribution of male and female across the gender score continuum. A higher gender score increased the prevalence of obesity [PR= 1.32 (1.09-1.60)], smoking [PR= 3.69 (2.43-5.59)], alcohol consumption [PR= 0.42 (0.31-0.55)], physical inactivity [PR= 1.68 (1.38-2.03)], family history of CVD [PR= 1.18 (1.07-1.30)], diabetes [PR= 1.94 (1.43-2.63)], cholesterol [PR= 1.13 (1.02-1.26)], hypertension [PR= 1.14 (1.00-1.29)], and antihypertensive medication [PR= 1.21 (1.04-1.41)]. After adjusting for CVD risk factors, female sex decreased the risk of CVD by 36% [HR= 0.64 (0.55-0.76)]. Moreover, males with feminine characteristics were at increased risk of CVD by 48% over the 24-year follow-up [HR= 1.48 (1.12-1.96)].

Conclusion: Our results suggested male participants with feminine characteristics were more likely to develop CVD while females with the same traditionally feminine characteristics were not at increased risk. Gender discrepancies may place males at increased risk of CVD, highlighting the importance of primary prevention strategies considering both sex and gender.

Session ID: B5.3, Lifecourse and Chronic Disease Epidemiology

Excess Mortality Among Comorbidity Cohorts in Nova Scotia Following COVID-19

Presented by: Kathryn Young-Shand

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Abstract

Objectives: This analysis aimed to quantify excess mortality, i.e., when more deaths than expected occur in a given period, following the COVID-19 pandemic in Nova Scotians overall and among stratified comorbidity population cohorts.

Methods: Mortality events in Nova Scotia (hospital systems, vital statistics, family notification) from 2016-2022 were linked with 2022 provincial Canadian Chronic Disease Surveillance System (CCDSS) datasets to obtain diabetes, hypertension, mental illness, and chronic respiratory disease cohorts. Deaths were aggregated to weekly count metrics from 2016-2019, and applied to a quasi Poisson generalized linear model with a season time trend to fit a baseline mortality model. This model was projected to provide an estimate of expected mortality for following calendar years. The proportion of observed mortalities in 2020-2022 exceeding expected events was defined as the sum of observed mortalities exceeding expected mortality events, divided by the sum of observed mortalities above and below expected events (i.e., sum of residuals). **Results:** In 2020, the proportion of observed mortalities exceeding expected estimates was 47% in Nova Scotia, validating model fit with observations evenly distributed above/below projected estimates. Proportions of observed mortalities exceeding expected projections grew stepwise from 2020 to 2022 (47%, 61%, 78%). Among comorbidity cohorts, the largest growth in excess mortality estimates were observed among individuals identified as having diabetes (36%, 51%, 70%), followed by hypertension (44%, 57%, 70%), mental illness (51%, 66%, 76%), and chronic respiratory disease (48%, 57%, 72%).

Conclusions: Provincial mortality observations closely approximated expected events in year one of the COVID-19 pandemic, with excess mortality events increasing stepwise in subsequent years. Increases in excess mortality may reflect multifaceted direct and indirect influences of public health measures during the COVID-19 pandemic, supporting the notion that measurable impacts are only emerging. Monitoring populations most affected in terms of mortality may inform important targeted supports longitudinally.

Session ID: B5.4, Lifecourse and Chronic Disease Epidemiology

Investigating the Patterns and Determinants of Pregnancy Loss: The Unique Opportunity of a Preconception Cohort in Pakistan

Presented by: Michelle Dimitris

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Abstract

Introduction: Pregnancy loss is the outcome of approximately 30% of conceptions. Early losses are often systematically missing from datasets, which may bias studies of prenatal exposures and postnatal outcomes. We examined the patterns and determinants of pregnancy loss in a population-based cohort in rural Pakistan.

Methods: The Matiari Empowerment and Preconception Supplementation Study (MaPPS), of which our study is an extension, was a cluster randomized-controlled trial that investigated the effect of preconception multiple micronutrient supplementation on nutrition and birth outcomes. The MaPPS trial quarterly monitored women aged 15-24, regardless of pregnancy intent, for ongoing pregnancy. We examined risk of pregnancy loss by gestational age, and stratified risk curves by pre-pregnancy characteristics. **Preliminary Results:** Among 17048 consenting households in which 25447 eligible women lived, we analyzed 4401 pregnancies. Mean (standard deviation) gestational age at pregnancy detection was 8.9 (3.7) weeks among 243 miscarriages/abortions, 14.7 (7.0) weeks among 134 stillbirths, and 14.5 (6.9) weeks among 4024 livebirths. Accordingly, we calculated risk of loss by allowing pregnancies to contribute follow-up time from: a) 0 weeks gestational age and b) the gestational age at pregnancy detection. Risk of pregnancy loss tended to decline from 8 to 20 weeks gestational age, though absolute risks differed by method of calculation; risks ranged from 0.3-1.2% at 8 weeks and 0.2-0.3% at 20 weeks. Preliminary results indicated that this pattern differed by pre-pregnancy self-reported health status, regardless of method of calculation, yet differed by pre-pregnancy body mass index only when pregnancies contributed follow-up time from pregnancy detection.

Conclusion: In this population-based cohort, the risk of pregnancy loss was highest at the lowest gestational ages, and steadily decreased to mid-pregnancy. Our completed study may provide insight on the correlates of pregnancy loss, and the extent to which differences in pregnancy detection by pre-pregnancy characteristics may bias results.

Session ID: B5.5, Lifecourse and Chronic Disease Epidemiology

Leveraging population health cohorts to identify cancer biomarkers in blood up to seven years prior to diagnosis

Presented by: Nicholas Cheng

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Abstract

Objectives. Liquid biopsies have been well demonstrated to be a non-invasive screening tool for detection of chronic diseases at early stage when treatment is most effective. However, evaluating the clinical utility of emerging biomarkers for early disease detection requires application of new technologies to biologics collected from asymptomatic individuals prior to a diagnosis. To demonstrate the value of utilizing longitudinal population health cohorts for early biomarker characterization and disease prediction, we leverage the Ontario Healthy Study (OHS) to profile over 400 cell-free DNA (cfDNA) methylation profiles up to seven years prior to a cancer diagnoses from cohort participants.

Methods. We identified incident cancer cases among OHS participants at the time of enrolment with no history of cancer but was later diagnosed with breast, prostate or pancreatic cancer during study follow-up. We performed cfDNA methylation profiling of blood plasma collected from participants at enrolment time among incident cancer cases and matched cancer-free controls. **Results.** We captured cfDNA features that discriminated cancer-free controls from pre-diagnosis cancer cases over five years before diagnosis, and show that these markers were reflective of methylation profiles from the originating cancer tissue and potentially lifestyle factors such as alcohol consumption. Further, using machine learning we developed predictive models from cfDNA methylation markers to predict future cancer risk, achieving an AUROC of 0.852 among held-out pre-diagnosis breast cancer cases and controls. Likewise, predictive models trained solely with pre-diagnosis cfDNA methylation samples were also generalizable and predictive of established prostate and pancreatic cancers, achieving average test AUROCs of 0.95 and 0.96.

Conclusions. By leveraging longitudinal population health cohort resources to interrogate pre-diagnosis biologic samples, our findings reveal that early cfDNA signatures of cancers can be detected up to six year prior to diagnosis and can be similarly extended to other conditions and alternative emerging methodologies interrogating blood biomarkers.

Session ID: C1.1, COVID Testing and Infectious Disease

An evidence-informed approach to planning mobile COVID-19 testing initiatives

Presented by: Maria Wilson

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Abstract

ObjectivesThe Public Health Mobile Unit (PHMU) program was created in fall 2020 to provide access to community COVID-19 services. We aimed to develop an evidence-informed approach for planning PHMU COVID-19 testing initiatives.

MethodsWe conducted a jurisdictional scan and consulted with PHMU leadership to determine a longlist of factors that were relevant to equitably directing limited testing resources across the province. We selected community clusters as our unit of analysis. These fifty-four small geographic areas were created to be meaningful to evidence-informed health planning and decision-making. We identified whether data sources existed or could be aggregated to the community cluster-level for each of these factors and excluded those that did not. We undertook a consensus exercise and determined correlations between variables. This process eliminated any variables deemed less relevant or highly collinear with other key factors. All variables were normalized on a scale of 0 to 1, relative to values across community clusters. Variables were reverse-coded, if necessary, so higher values indicated higher need in an additive index. **Preliminary Results**We combined the variables into three distinct indices for decision-making: demographic & health status, testing access, and recent COVID-19 activity. We created a Tableau dashboard to visualize the indices across community clusters. This product is updated on a biweekly basis to align with the PHMU testing planning cycle. We will analyze testing clinic location data and conduct interviews with PHMU staff to determine how the report was used to plan COVID-19 testing initiatives from October 2022 to March 2023. **Next Steps**The PHMU program is transitioning to respond to other health needs, such as immunization (COVID-19 and other) and provision of primary healthcare, especially in rural, underserved, and hard-to-reach populations. This index can be adapted to assist with decision-making as the PHMU portfolio evolves.

Session ID: C1.2, COVID Testing and Infectious Disease

Factors associated with SARS-CoV-2 testing and test positivity in children and parents: a longitudinal cohort study

Presented by: Mary Aglipay

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Abstract

OBJECTIVES: Understanding heterogeneity in risk for SARS-CoV-2 infection is important for optimizing the Covid-19 public health response. The objective of this study was to determine risk factors associated with time to test positivity and time to testing in children and mothers.

METHODS: A longitudinal cohort study was conducted in healthy children aged 0-10 years and their mothers through the TARGet Kids! COVID-19 Study in Toronto, Canada and RT-PCR testing data from provincial laboratory systems (April 2020-December 2021). Outcomes were time to first positive test for SARS-CoV-2 infection (primary) and time to PCR test (secondary). Risk factors investigated included adherence to public health measures, sociodemographic factors, and COVID-19 vaccination status. Data was analyzed using Cox proportional hazards models and Andersen-Gill models. **RESULTS:** 10289 children were included; 47.7% were girls and mean age was 5.62 (SD=2.49) years. For children, number of community cases (per 1000 cases, HR=1.04, 95%CI: 1.01-1.07) and maternal infection (HR=5.49, 95%CI: 4.36-6.92) were associated with test positivity. For mothers, number of community cases (HR=1.04, 95%CI: 1.01-1.06), child infection (HR=7.44, 95%CI: 5.49-10.09), and being unvaccinated (HR=2.0, 95%CI: 1.54-2.63) were associated with test positivity. Factors associated with PCR testing in children were greater adherence to public health measures, and maternal vaccination, European ethnicity, and university education. Among mothers, European ethnicity, university education, number of household members, number of community cases, and child vaccination were associated with time to PCR testing.

CONCLUSION: SARS-CoV-2 infection in the family and community were associated with time to infection in children and mothers. Social determinants were associated with increased probability of testing. Investment in equitable access to testing and population-level interventions may reduce SARS-CoV-2 transmission in families.

Session ID: C1.3, COVID Testing and Infectious Disease

Factors affecting knowledge, beliefs, and behaviour toward COVID-19 vaccine booster doses: a cross-national mixed-methods study

Presented by: Michal Cherak

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Abstract

Objectives: COVID-19 vaccination knowledge, beliefs, and behaviours can evolve over time, reflecting a continuum of vaccine acceptance. Vaccine hesitancy, defined as the delay in acceptance or refusal of available vaccines, challenges broad immunization coverage. The aim of this mixed-methods study was to investigate evolving knowledge, beliefs, and behaviour toward continued COVID-19 vaccination (i.e., a booster dose) among COVID-19 vaccinated individuals.

Methods: We are conducting a multi-phase mixed-methods study including: (1) a nationally representative survey of the Canadian public, and (2) semi-structured follow-up interviews. Data from the survey was summarized using descriptive statistics and demographic differences; perceptions of vaccine effectiveness, recommended doses, and trust in decisions were assessed using the Rao-Scott correction for weighted chi-squared tests. Multivariable logistic regression models were used to identify the association between a priori defined variables and vaccine hesitancy. Ongoing follow-up semi-structured interviews explore knowledge, beliefs, and behaviour toward continued COVID-19 vaccination via a longitudinal qualitative design. **Results:** Lower education (Odds Ratio (OR) 1.90, 95% Confidence Interval (CI) 1.29-2.81) and having children (OR 1.89, 95%CI 1.39-2.57) were associated with increased odds of hesitancy toward a booster dose; higher income (\$100,000-\$149,999: OR 0.60, 95%CI 0.39-0.91; \$150,000+: OR 0.49, 95%CI 0.29-0.82, respectively) was associated with decreased odds. Disbelief in effectiveness (against infection: OR 3.69, 95%CI 1.98-6.90; illness: OR 3.15, 95%CI 1.69-5.86), disagreeing with government decisions (somewhat: OR 2.70, 95%CI 1.38-5.29; strongly: OR 4.62, 95%CI 2.20-9.7), and beliefs in over vaccinating (OR 2.07, 95%CI 1.53-2.80) were associated with booster dose hesitancy. Follow-up interviews will deepen our understanding of the evolution of COVID-19 vaccine hesitancy and identify target areas for improved vaccine acceptance.

Conclusion: Our findings indicate COVID-19 vaccinated individuals may not accept a booster dose, highlighting the potential for the evolution of vaccine hesitancy. The data provides variables to consider when developing, implementing, and assessing vaccine uptake interventions.

Session ID: C1.4, COVID Testing and Infectious Disease

Detection and clearance of vaginal human papillomavirus (HPV) infections in young women: Insights from woman-level and HPV-level (HPV genotype-specific) analyses

Presented by: Andrew Arthur

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Abstract

Objectives: Understanding detection and clearance of incident HPV infections is essential for cervical cancer prevention planning. Past studies performed woman-level analyses (i.e., the woman was the unit of observation), which incorporated the detection and clearance of multiple HPV infections into composite outcomes, potentially obscuring the natural history of individual infections. Conversely, HPV-level analyses (where genotype-specific infections are the unit of observation) have a stronger biological rationale for accurately characterizing HPV infection natural history.

Methods: 453 women aged 18-24 years in the HPV Infection and Transmission among Couples through Heterosexual activity (HITCH) study provided 6 vaginal specimens over 24 months. Specimens were tested for 36 HPV types. All women initiated a sexual relationship with a male partner within 6 months before enrolment. Using rates and Kaplan-Meier analysis, we calculated time-to-event statistics for detection and clearance of incident HPV infections (by oncogenicity) with 95% confidence intervals (in brackets), at the woman- and HPV-levels. **Results:** Women had, on average, 6.4 previous sexual partners, and were having sex 4.6 times per week. By 24 months, we detected one or more incident HPV infections in 40.4% [33.4-48.4] of women. At the HPV-level, we detected 1.7 [1.5-2.0] high oncogenic-risk infections per 1000 infection-months. 47.1 [39.9-55.5] high oncogenic-risk infections cleared per 1000 infection-months (median infection duration:12.7 [9.4-15.1] months). Low oncogenic-risk and commensal infections cleared at comparable rates: 43.4 [33.6-56.4] and 46.6 [37.7-57.7] per 1000 infection-months, respectively. The median durations of low oncogenic-risk and commensal infections, 13.1 [9.9-17.6] and 12.2 [9.7-15.1] months, respectively, were similar to oncogenic infections.

Conclusion: Our woman-level analyses agreed with similar past studies. However, our HPV-level analyses did not clearly indicate that high oncogenic-risk HPV infections take longer to clear than their low oncogenic-risk and commensal counterparts. Our HPV-level estimates of incident HPV infection natural history provide biologically-informed parameters for cervical cancer prevention planning.

Session ID: C1.5, COVID Testing and Infectious Disease

Concordance of genital human papillomavirus (HPV) infection between females' sequential male partners: Implications for gender-neutral HPV vaccination

Presented by: Andrew Arthur

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Abstract

Objectives: Couple-based studies have focused on HPV transmission in dyads (i.e., 2 individuals). We investigated HPV infections in 2 sequential male partners of the same female.

Methods: 42 women (aged 18-24) in the HPV Infection and Transmission among Couples through Heterosexual activity (HITCH) study enrolled 2 male partners (aged 18-35). Women (hereafter Female) provided vaginal specimens at 6 visits over 24 months, whereas each male partner (hereafter Male 1 and Male 2) provided 2 penile/scrotal specimens at 2 visits over 4 months. Specimens were tested for 36 HPV types. We assessed HPV type-specific infections along Male 1-Female-Male 2 sexual relationships. We calculated the observed/expected ratio (O/E) of concordant infections between Males 1 and 2. Using logistic regression, we estimated the odds ratios (ORs) for Male 2 testing positive for the same HPV type as Male 1 overall, by median time gap between Male 1 and Male 2 specimens (greater vs. less than 10.2 months) and by Male 2 condom use (greater vs. less than 75% frequency). 95% confidence intervals are provided in brackets. **Preliminary Results:** Analyses were based on 1512 Male 1: Male 2 type-specific HPV infection pairs. The crude O/E was 2.6 [1.9-3.4]. Overall, Male 2 had 3.8 [2.4-5.8] times the odds of testing positive vs. negative for the same HPV type as Male 1. ORs differed by median time gap (4.6 [2.5-8.7] vs. 3.0 [1.5-5.9]) and Male 2 condom use (4.0 [2.2-7.2] vs. 3.3 [1.6-7.1]). Adjusting for Female positivity with the same HPV type before/by Male 2 enrolment nullified Male 1: Male 2 associations. **Conclusion:** Detection of the same HPV type in subsequent sexual partners was 2-3 times more likely than chance; Male 2 positivity for an infection observed in Male 1 was mediated by their Female partner's positivity for that type. These findings support gender-neutral HPV vaccination.

Session ID: C2.1, Mental Health and Substance Use (Adult, Occupational)

The Working Life Expectancy of American Adults Experiencing Depression

Presented by: Kathleen Dobson

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Abstract

Objectives: To quantify the number of latent depression trajectories from the late 20s to early 50s, estimate the working life expectancy (WLE) for men and women in each trajectory, and estimate WLE by race/ethnicity and educational attainment for each trajectory.

Methods: Data from 8,223 participants collected from 1979-2018 in the American National Longitudinal Survey of Youth 1979 cohort was used. Depression was measured using the Center for Epidemiologic Studies Depression Scale Short Form at four time points (ages 28-35, ages 30-37, age 40, and age 50). Labor force status was measured monthly starting at age 30 until ages 58-62. Depressive symptom trajectories were estimated using growth mixture modeling and multistate modeling was used to estimate WLE from age 30-60 for each gender and depressive symptom trajectory. **Results:** Four latent symptom trajectories were uncovered: a low symptom trajectory (n=6,005), an episodic trajectory with high symptoms occurring before age 40 (n=928), an episodic trajectory with high symptoms occurring around age 40 (n=483), a trajectory with high symptoms occurring around age 50 (n=550), and a persistent high symptom trajectory (n=257). The WLE at age 30 was 30.8 years for the low symptom trajectory, 23.5 years for the episodic before 40 trajectory, 19.6 years for the episodic around age 40 trajectory, 18.6 years for the episodic around age 50 trajectory, and 13.0 years for the persistent symptom trajectory. Results were similar for women. Disparities between WLE trajectories grew when stratified by race/ethnicity and education level.

Conclusions: Most individuals experiencing depressive symptoms do so episodically between the late 20s to early 50s, however these individuals were expected to be employed ~7.3 to 17.8 years less at age 30 compared to those with low/no symptoms. Ensuring employment programs and disability legislation helps keep individuals attached to work is critical to improving WLE among those with depression.

Session ID: C2.2, Mental Health and Substance Use (Adult, Occupational)

The mental health and well-being of staff at violence against women organizations: Findings from a mixed-methods study of leaders and service providers in Canada's largest city during the COVID-19 pandemic

Presented by: Bridget Steele

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Abstract

Objectives: Staff at violence against women (VAW) organizations provide essential services for survivors. The increase of VAW during the COVID-19 pandemic placed additional pressures on VAW staff. We aimed to understand the impacts of the pandemic on the mental health and well-being of VAW staff (both frontline and leadership) in the Toronto region to inform recommendations for policy and practice.

Methods: We analysed quantitative survey data from 127 VAW staff who completed the Patient Health Questionnaire-4 and The Vicarious Trauma Scale. We then applied thematic analysis to qualitative data from 18 semi-structured interviews with VAW staff and one semi-structured focus group. **Preliminary Results:** We found that the pandemic impacted on the mental health and well-being of VAW staff. In the survey, 81% (n=26) of leadership and 61% (n=43) of frontline staff indicated that their work was more distressing during the pandemic. Frontline participants had greater mean vicarious trauma scores and higher anxiety and depressive symptom scores when compared to leadership. To nuance the results of the quantitative data, we identified three thematic areas in the qualitative data: (1) Challenges of working from home (e.g. isolation and keeping work and home life separate); (2) increased workload (e.g. staffing shortages, reduced wrap-around supports, and an increase in clients and the complexity of cases), and; (3) stress from working in congregate care settings (e.g. contracting COVID-19 or exposing a family member).

Conclusion: To alleviate the burden the pandemic placed on the mental health and well-being of VAW staff, we suggest that VAW organizations require increased resources and flexible funding to respond to higher and more complex caseloads during public health emergencies. We also recommend that VAW organizations create more time and space for connection and support among staff both virtually and in-person, and facilitate a range of self-care opportunities to meet staff needs.

Session ID: C2.3, Mental Health and Substance Use (Adult, Occupational)

Opioid-related poisonings in the Ontario workforce compared to the general population

Presented by: Jeavana Sritharan

All Authors: Jeavana Sritharan^{1, 2}, Gregory Feng^{1, 2}, Chaojie Song¹, Paul Demers^{1, 2}, Nancy Carnide^{2, 3}

Author Affiliations: ¹Occupational Cancer Research Centre, Ontario Health, ²Dalla Lana School of Public Health, University of Toronto, ³Institute for Work & Health

Abstract

Objectives: As Canada continues to face an opioid crisis, there is limited understanding on risk of opioid-related harms among workers. This study examines the incident rates of opioid-related poisonings by occupation and industry in the Ontario workforce, compared to the general population.

Methods: The Occupational Disease Surveillance System (ODSS) was established by linking Ontario workers' compensation claim records (1983-2019) to hospitalization and emergency department records (2006-2020). Incidence rates of opioid-related poisonings (toxicity due to excess of opioids) among workers in the ODSS were compared to the general Ontario population. Standardized incidence ratios (SIRs) and 95% confidence intervals (CI) were calculated and standardized by calendar year, age, sex, and health region. **Results:** Overall when compared to the general population, opioid-related poisonings among workers in the ODSS were elevated in hospitalization (SIR 1.54, 95%CI 1.50-1.59) and emergency department (SIR 2.41, 95%CI 2.37-2.45) records. For hospitalizations, poisonings were elevated in several occupations, including processing (mineral, metal, chemical) (SIR 2.04, 95%CI 1.74-2.39), construction trades (SIR 1.89, 95%CI 1.72-2.07), and transport equipment operating (SIR 1.80, 95%CI 1.62-2.00) when compared to the general population. In emergency department visits, construction trades (SIR 3.16, 95%CI 3.01-3.33), materials handling (SIR 2.85, 95%CI 2.65-3.07), and processing (mineral, metal, chemical) (SIR 2.73, 95%CI 2.44-3.03) occupations showed particularly elevated risks. For hospitalizations, when compared to the general population, poisonings were elevated in construction (SIR 2.0, 95%CI 1.83-2.18), forestry, fishing, and trapping (SIR 1.79, 95%CI 1.14-2.69), and community, business, and personal service (SIR 1.66, 95%CI 1.57-1.76) industries. Similar industry findings were observed in emergency department visits.

Conclusions: These formerly injured workers demonstrated elevated risks for opioid-related poisonings compared to the general population. Workers in various occupations and industries were found to have an increased risk of poisonings. Findings demonstrate the importance of occupational surveillance of opioid-related harms that can further inform prevention activities.

Session ID: C2.4, Mental Health and Substance Use (Adult, Occupational)

Determinants of mental disorders among working seniors: insights from the Canadian community health surveys

Presented by: Batholomew Chireh

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Abstract

ObjectivesThis study examines the relationship between work stress, age, work status, and mental health of Canadian seniors (65+ years) who continue to work. This aim is to fill the research gap on the potential influence of working later in life on mental health, as the aging population and labor force shortages increase the need to encourage seniors to work longer.

MethodsThe study uses data from the Canadian Community Health Surveys- Annual Components (2013-2018) and includes a subsample of (N= 9,170) working seniors. A logistic regression model is used to analyze the determinants of depression and anxiety disorder symptoms. Descriptive statistics, prevalence estimates, adjusted odds ratios, and 95% confidence intervals are reported.**Results** The prevalence of depression and anxiety is 5.2% and 3.7% respectively. The results show that post-retirement work is a protective factor against mental disorders, potentially because those with poor mental health are excluded from the workplace. Older age and full-time work are protective factors for depression (OR=0.74, 95% CI: 0.60-0.90) and anxiety (OR=0.63, 95% CI: 0.50-0.80), while extreme work stress is a significant determinant of both mental disorders [(OR=1.92, 95% CI: 1.48-2.49, depression vs OR=2.12, 95% CI: 1.58-2.85, anxiety)]. The study also identifies several covariates, including females, being single, smoking, and multimorbidity, which are significant determinants of mental disorders. The findings highlight sex differences in the risk factors of mental disorders, suggesting that different approaches may be needed for men and women.

ConclusionOverall, the study suggests that while seniors should be encouraged to engage in post-retirement work due to its financial and mental health benefits, efforts should be made to realign their skill sets to less physically demanding occupations. The study's findings have implications for the development of policies and interventions aimed at improving the mental health and well-being of seniors in the workforce.

Session ID: C2.5, Mental Health and Substance Use (Adult, Occupational)

Understanding Sex- and Gender-Based Drivers of the Excess Risk of Psychotic Disorders Among Migrants

Presented by: Jahin Khan

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Abstract

Objectives: Research suggests that the risk of psychosis is more than two-times higher in some first-generation migrant groups, although it is unclear why. Previous meta-analyses have not found significant differences in the risk of psychosis among migrants compared to non-migrants by sex. But there may be sex- and gender-based differences in the factors that modify risk. For example, a recent study shows that women migrating alone may be at higher risk compared to women migrating with or to join family, whereas men joining family are at higher risk than men migrating alone. This study aims to identify sex- and gender-based factors that modify the risk of psychotic disorder among migrants to Ontario. Therefore, we examine how sociodemographic and migration-related variables affect risk in men and women separately.

Methods: We constructed a retrospective cohort of 2 million migrants who arrived in Ontario between 1992-2011. Immigration data was linked to health administrative databases, so that cohort members can be followed to identify first-onset cases of non-affective psychotic disorder (NAPD). Poisson regression models will be stratified by sex to estimate the effects of country of origin, age at migration, migrant class, marital status, highest level of education, neighbourhood income, and rurality on the risk of NAPD in men and women. **Preliminary Results:** The cohort is 48.2% male, and the NAPD sample is 53.4% male. Migrant men have a higher incidence of NAPD compared to migrant women (IRR=1.20, 95% CI: 1.16, 1.23). Additional results will be presented.

Conclusion: Little is known about the determinants of psychosis risk in migrants, let alone how sex and gender interact with these determinants. This study will identify sex- and gender-based factors that modify risk among migrants in Ontario, which will help elucidate the mechanisms underlying risk and inform targeted public mental health interventions.

Session ID: C3.1, Clinical Epidemiology

Variation in baseline estrogen levels and menopause-related toxicities among women on the MAP3 chemoprevention trial

Presented by: Harriet Richardson

All Authors: Harriet Richardson¹, Vikki Ho², Romain Pas², Ravinder Singh³, Matthew Goetz³, Dongsheng Tu¹, Paul Goss⁴, James Ingle³

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Abstract

Background: Breast cancer prevention has been demonstrated using aromatase inhibitors (AI) including exemestane. However, menopause-related side-effects due to estrogen suppression can limit uptake and adherence in the prevention and adjuvant settings. **Objectives:** To examine associations between estrone (E1) and estradiol (E2) at baseline and adverse menopause-related symptoms at follow-up among postmenopausal women randomized to exemestane or placebo in the MAP3 breast cancer chemoprevention trial. **Methods:** E1 and E2 levels were measured from MAP3 baseline serum samples (n=4111) using liquid chromatography tandem mass spectrometry (LC-MS/MS) and categorized into quartiles. Menopause-related symptoms including hot flashes, fatigue, and joint pain were assessed with the Common Terminology Criteria for Adverse Events (CTCAE, V4) form at baseline, 6 & 12 months, and annually thereafter, up to five years. Severe toxicity (\geq grade 3) was contrasted with less severe toxicity ($<$ grade 3). Logistic regression was used to calculate odds ratios and 95% confidence intervals for E1 and E2 levels and each symptom at years 1 and 5, stratified by treatment group. **Results:** Women on exemestane in the highest quartile for E1 (median 40 pg/ul) or E2 (median 9.8 pg/ml) levels at baseline were significantly more likely to develop severe hot flashes at year 1 (E1: OR_{Yr-1}=3.29, 95% CI: 1.31-8.29 and E2: OR_{Yr-1}=3.86, 95% CI: 1.38-10.85) compared to women in the lowest quartile. These associations persisted out to 5 years for both E1 and E2. There were no significant associations between baseline E1 or E2 levels and joint pain and fatigue in the exemestane group nor with severe hot flashes, fatigue or joint pain in the placebo group. **Conclusion:** Postmenopausal women with elevated estrogen levels are at greater risk for development of severe hot flashes once they initiate exemestane and may benefit from additional counselling to limit early discontinuation.

Session ID: C3.2, Clinical Epidemiology

Post-initiation predictors of discontinuation of the sodium-glucose co-transporter-2 inhibitors: A comparative cohort study from the United Kingdom.

Presented by: Wajd Alkabbani

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Abstract

Objective: To assess post-initiation predictors of discontinuation of sodium-glucose co-transporter-2 (SGLT-2) inhibitors compared to dipeptidyl-peptidase-4 (DPP-4) inhibitors in the UK.

Methods: A comparative population-based retrospective cohort study using primary care data from the United Kingdom's Clinical Practice Research Datalink with linked data to hospital and death records. We included new metformin users who initiated either SGLT-2 inhibitors or DPP-4 inhibitors between Jan-2013 and Oct-2019. The main outcome was treatment discontinuation, defined as the first 90-day gap after the estimated treatment end date. We used a series of extended cox models adjusted for baseline characteristics to assess which time-dependent predictors were associated with treatment discontinuation. To test if the hazard ratio of discontinuation for each predictor was statistically different between SGLT-2 and DPP-4 inhibitors, an exposure-predictor interaction term was added to each model. **Results:** There were 2550 new users of SGLT-2 inhibitors and 8195 new users of DPP-4 inhibitors. Diabetic ketoacidosis and fractures after treatment initiation were predictors of discontinuation of SGLT-2 inhibitors only (HR, 95%CI = 2.64, 1.37-5.10 and 1.91, 1.28-2.86, respectively) but not DPP-4 inhibitors (HR, 95%CI = 1.14, 0.72-1.82 and 0.90, 0.78-1.04, respectively). Acute kidney injury was a significant predictor of discontinuation for both SGLT-2 and DPP-4 inhibitors, albeit significantly higher for SGLT-2 inhibitors. The rate of treatment discontinuation was significantly higher for those with low eGFR after treatment initiation among the SGLT-2 inhibitor.

Conclusions: Specific adverse events after treatment initiation were associated with higher rates of discontinuation of SGLT-2 inhibitors.

Session ID: C3.3, Clinical Epidemiology

Adjuvant ovarian function suppression in Alberta: a real-world analysis of treatment patterns and effects in premenopausal hormone receptor positive breast cancer

Presented by: Robert B. Basmadjian

All Authors: Robert B. Basmadjian¹, Yuan Xu¹, May Lynn Quan¹, Sasha Lupichuk¹, Winson Y. Cheung¹, Darren R. Brenner¹

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Abstract

Objectives: The first objective of this study was to describe initiation and duration patterns of ovarian function suppression (OFS) in the adjuvant setting of premenopausal hormone-receptor positive breast cancer in Alberta. The second objective was to estimate the real-world effect of remaining compliant to adjuvant OFS plus standard endocrine therapy (E-OFS) for at least 2 years recurrence-free survival (RFS).

Methods: All women diagnosed with non-metastatic breast cancer between January 2010, and December 2020, in Alberta, were identified via record linkage between various administrative databases and the Alberta Cancer Registry. Time-to-treatment and discontinuation curves and median times were estimated using the Kaplan-Meier method. For the effects analysis of treatment duration, two strategies were compared: (1) compliance to E-OFS for at least 2 years; and (2) discontinuing E-OFS within 2 years of initiation. Follow-up began on the date of endocrine therapy (ET) initiation and patients were followed until recurrence or censoring in April 2022. To address time-varying selection bias and confounding, marginal Cox models with inverse-probably censoring weights (IPCW) and treatment weights (IPTW) were employed to estimate hazard ratios (HR) and 95% confidence intervals (95% CI). **Results:** This analysis included 2683 patients, where 2293 (85.5%) initiated ET alone, 128 (4.8%) discontinued E-OFS, and 262 (9.7%) remained compliant to E-OFS. From surgery, median time to ET initiation was 126.5 days. From ET initiation, median time to OFS initiation 164 days. In the overall cohort, the risk of recurrence was 64% lower in those compliant to E-OFS versus those who discontinued (HR=0.36; 95% CI: 0.22-0.56).

Conclusions: Our study demonstrates that OFS is not initiated at the same time as ET and that compliance to E-OFS for 2 years lowers recurrence risk. Future studies should explore reasons for OFS discontinuation to improve compliance and outcomes in this patient population.

Session ID: C3.4, Clinical Epidemiology

Respiratory function as a prognostic factor in lung cancer survival

Presented by: Kiera Murison

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Abstract

Objectives: In response to the global burden attributed to lung cancer mortality, we examined respiratory function as a potential prognostic factor of lung cancer mortality in data collected for the National Lung Screening Trial (NLST), a high-risk screening population, and the UK Biobank (UKB), a population-based cohort.

Methods: Participants in NLST and UKB with spirometry data and diagnosed with lung cancer were included in the analysis. Lung function was estimated based on spirometry measurements of forced expiratory volume in 1-second (FEV1) and forced vital capacity (FVC), allowing for derivation of the FEV1/FVC ratio, quantifying lung performance, and the percentage of predicted FEV1 based on demographic characteristics. Multivariable Cox proportional hazards regression models and Fine and Gray competing-risk regression models were fit to estimate adjusted hazard ratios (aHR) for all-cause mortality, and lung cancer specific mortality, respectively. The analyses were conducted separately by study to evaluate the impact of lung function on lung cancer prognosis in populations with different baseline risk.

Results: In total, 609 and 3,013 participants were included in the analysis from the NLST and the UKB, respectively. Based on the UKB, a higher percentage of predicted FEV1 was shown to lead to better prognosis after lung cancer diagnosis with an aHR of 0.98 (95% CI: 0.96 - 1.00 per 10% increase), and severe or very severe COPD was associated with worse lung cancer outcome compared to those without COPD with an aHR of 1.22 (95% CI: 1.02 - 1.46). In the NLST, no statistically significant results were observed when assessing all-cause or lung cancer-specific mortality.

Conclusions: Impaired lung function was associated with poorer survival of lung cancer patients in the general population, but not the screening-eligible population. Clinically, this suggests that lung function may be a valuable prognostic factor in lung cancer patients who do not meet high-risk screening criteria.

Session ID: C3.5, Clinical Epidemiology

Sleep quality as a prognostic factor in older adults with chronic low back pain: a prospective cohort study and preliminary results from a systematic review with meta-analysis

Presented by: Samuel Silva

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Abstract

Objectives: Low back pain (LBP) prevalence can reach 68% in the elderly population. Poor sleep quality has been associated with impaired pain control pathways and may affect the prognosis of elderly people with LBP. However, it is unclear whether sleep quality is related to recovery for patients receiving physical therapy care. The aim of this study was to investigate the association of sleep quality with improvements in pain and functional limitations in older adults with chronic LBP after physical therapy care.

Methods: This was a pre-post intervention study. Eligible participants were ≥ 60 years old, reported non-specific LBP for ≥ 3 months, and were initiating physical therapy care. Individuals were excluded if they presented with cognitive decline, specific LBP, or radiculopathy. Before starting treatment, participants completed questionnaires to assess cognitive functioning (Leganés Cognitive Scale), sleep quality (Pittsburg Sleep Quality Index (PSQI)), pain intensity (Numeric Rating Scale (NRS)), functional limitations (Roland-Morris Questionnaire (RMQ)), and depression (Geriatric Depression Scale (GDS-15)). We assessed pain and functional limitation outcomes after 2 months of physical therapy care (exercise program: 1-hour sessions, twice a week). We ran multiple linear regression models with change in pain or functional limitations as dependent variables, sleep quality as independent variable, and adjusted for age, BMI, and GDS-15 score. Results: We included 114 participants (73.7% women; mean age 69.7 ± 5.9 years; mean baseline NRS score of 7.0 ± 2.1 ; mean baseline RMQ score of 12.2 ± 5.2). We found no association between sleep quality and changes in pain intensity (β , -0.086 ; 95% CI: $-0.314, 0.143$) or functional limitations (β , -0.008 ; 95% CI: $-0.232, 0.216$).

Conclusion: Sleep quality was not associated with improvements in chronic LBP after physical therapy care. Our results contradict previous studies that found sleep quality to be associated with clinical improvement in elderly people with chronic LBP not receiving physical therapy care.

Session ID: C4.1, Health Research Using Administrative Data

Association between physician characteristics and antiplatelet medication dispensed to community dwelling New Brunswick older adults following hospital discharge for myocardial infarction between 2009 and 2017

Presented by: Devin Manning

All Authors: Devin Manning¹, Daniel Dutton¹, Robert Stevenson¹, Sanja Stanojevic¹, Adrian Levy¹

Author Affiliations: ¹Dalhousie University

Abstract

Purpose: Differences in medications dispensed after myocardial infarction (MI) based on the demographic characteristics of the treating physician have been documented. The objective was to determine whether the medical specialty, the year and medical school of graduation, and the sex of the treating physician were associated with the likelihood a patient received an antiplatelet agent (P2Y12 inhibitor) after hospital discharge. **Methods:** Administrative health databases were linked to conduct this retrospective cohort study. Subjects included community-dwelling individuals aged 66 years and older with publicly covered drug insurance who were discharged home from hospital after an MI between January 2009 and December 2017. The outcome was a dispensation of a P2Y12 inhibitor within 90 days of hospital discharge. Logistic regression was used to estimate the association between physician characteristics and P2Y12 dispensation after adjusting for patient demographic characteristics. The effect of “clustering” of subjects who were treated by the same physician was accounted for using generalized estimating equations. **Results:** The study cohort consisted of 2674 MI subjects who were treated by 433 physicians, resulting in an average of 6.2 patients per physician (SD 17.6). In total, 70% of subjects received a P2Y12 inhibitor after hospital discharge. Subjects were almost three times more likely to receive a P2Y12 inhibitor if treated by a cardiologist [OR 2.7; 95% CI 2.0, 3.5] than if treated by a general practitioner. Subjects treated by a female physician were 30% less likely to receive a P2Y12 inhibitor [OR 0.7; 95% CI 0.5, 0.9] compared to those patients treated by a male physician. No systematic differences were observed between subjects treated by physicians based on location or year of medical school graduation. **Conclusions:** These findings highlight practice variations in treating patients following MI in NB and can be used by policymakers to target interventions aimed at increasing guideline adherence.

Session ID: C4.2, Health Research Using Administrative Data

Publicly funded prescription drugs dispensed to community dwelling New Brunswick older adults following hospital discharge for myocardial infarction between 2009 and 2017

Presented by: Devin Manning

All Authors: Devin Manning¹, Daniel Dutton¹, Robert Stevenson¹, Sanja Stanojevic¹, Adrian Levy¹

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Abstract

Background: The Canadian guidelines for effective therapies in secondary prevention after myocardial infarction (MI) were revised in 2010, recommending the use of potent antiplatelet medication, P2Y₁₂ inhibitors. However, no studies using administrative health claims data from any Canadian province have been published to assess the use of P2Y₁₂ inhibitors post-MI. Additionally, there is a lack of published data from the province of New Brunswick (NB) regarding the proportion of MI survivors who receive any of the recommended medications. The objective was to estimate the annual proportion of elderly survivors of MI who were dispensed guideline-directed medications after hospital discharge in NB.

Methods: A serial cross-sectional study was conducted using linked administrative health databases curated by the NB Institute for Health Research, Data, and Training. Subjects included community-dwelling individuals aged 66 years and older with publicly covered drug insurance who were discharged home from hospital after an MI between January 2009 and December 2017. The outcome was the annual proportion of patients who filled a prescription for a statin, β -blocker, renin-angiotensin-aldosterone system inhibitors (RAAS; using angiotensin-converting enzyme inhibitors or angiotensin receptor blockers), and P2Y₁₂-inhibitor, within 90-days of hospital discharge. A chi-squared test of independence was used to analyze the trend over time. **Results:** The cohort consisted of 2674 subjects, 53% of whom were men, with a mean age of 78 y [standard deviation (SD) 8]. Overall, 79% of subjects received a β -blocker, 71% received a RAAS agent, 83% received a statin, and 70% received a P2Y₁₂ inhibitor within 90 days of hospital discharge. There were no statistically significant trends in the annual proportion of subjects dispensed each medication class over time.

Conclusions: The proportion of patients receiving medications post-discharge remained constant between 2009 and 2017 in NB. These results are comparable to estimates from other Canadian provinces.

Session ID: C4.3, Health Research Using Administrative Data

Predicting population risk of suicide in Quebec: Model development and validation

Presented by: JianLi Wang

All Authors: JianLi Wang¹, Fatemeh Kharrat², Jean-François Pelletier³, Louis Rochette⁴, Eric Pelletier⁴, Pascale Lévesque⁴, Victoria Massamba⁴, Camille Brousseau-Paradis³, Mada Mohammed¹, Geneviève Gariépy⁵, Christian Gagne², Alain Lesage³

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Abstract

Objective: To develop and validate prediction models for population risk of suicide using health administrative data. **Methods:** A case-control study design was used to develop sex-specific predictive models for population risk of suicide. The target population was the general population residing in the province of Quebec. We linked five health administrative databases and the Canadian Urban Environmental Health Research data. The linked health administrative databases included: the vital statistics death, the physician claims, the hospital discharge, the Insured Person Registration File and the public drug plan. We selected all death by suicide cases that occurred from January 1st 2002 to December 31st 2010 (n = 8,899). The control group was a 1% random sample of living individuals in Quebec each year (n = 645,590). Individual, programmatic, systemic and community factors up to five years prior to the suicide events were used as candidate predictors to develop the risk predictive algorithms. We used logistic regression to develop the sex-specific statistical models. After model validation using individual data, we converted the models to make synthetic estimation of suicide risk in the future. Data from 2011 to 2019 were used to validate the synthetic estimates by comparing with the observed proportions of suicide each year. **Results:** The model for males had 20 predictors (C = 0.79, Brier score = 0.01) and the model for females included 22 predictors (C = 0.85, Brier score = 0.005). The synthetic estimates of the proportions of suicide from 2011 to 2019 were close to the observed proportions of suicide, with the maximum absolute difference of 0.001%.

Conclusion: It is possible to develop sex-specific models for predicting population risk of suicide using health administrative data. The models may be used by decision makers to project population risk of suicide at the population level.

Session ID: C4.4, Health Research Using Administrative Data

Mental Disorder Risk Prediction Using Family Health Histories Identified from Population-Based Electronic Healthcare Records

Presented by: Amani Hamad

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Abstract

Objectives: Family structure information in administrative databases can be used to build family health histories and potentially improve the prediction of mental disorder risk. We tested for improved mental disorder risk prediction using objectively measured parental comorbidity history from administrative healthcare databases.

Methods: We conducted a population-based cohort study of Manitoba residents who were 18 years or older between 1977 and 2020 and had linkages to ≥ 1 parent and ≥ 1 grandparent. Mental disorder diagnoses (mood and anxiety, substance use, and psychotic disorders) after 17 years of age were identified from hospitalization and outpatient records. Predictors were selected using LASSO regression. The base model included demographic information and family mental disorder history. Subsequent models included comorbidity history (130 chronic conditions) of the cohort and their parents. Classification was performed using a predicted probability threshold of 0.5. Preliminary results: The cohort consisted of 125,070 individuals: 48.9% were female; 40.2% had a mental disorder diagnosis during follow-up (median age: 21.0 years; Q1-Q3: 19.0-25.0); and 96.4% had a parent, grandparent, or sibling with a mental disorder. The base model achieved a sensitivity of 64.5% (63.9%-65.1%), specificity of 57.3% (56.1%-58.5%), and area under the receiver operating characteristic curve (AUC) of 0.64 (0.63-0.65). Including the comorbidity history of the cohort improved risk prediction: sensitivity=67.0% (66.4%-67.6%), specificity=62.0% (60.9%-63.1%), AUC=0.68 (0.67-0.68). Parental comorbidity history further improved prediction: sensitivity=68.6% (68.0%-69.2%), specificity=64.4% (63.4%-65.5%), AUC=0.71 (0.70-0.72). Among the predictors with the strongest odds ratios (ORs) were history of adjustment disorders (OR=2.26), attention deficit, conduct and disruptive behavior disorders (OR=1.44), personality disorders (OR=1.39); and parental history of gastroduodenal ulcers (OR=1.15).

Conclusions and next steps: The comorbidity history of the cohort and their parents, identified using administrative healthcare data, improved mental disorder risk prediction. Next, we will test if grandparent and sibling comorbidity history further improves performance.

Session ID: C4.5, Health Research Using Administrative Data

Comparison of all-cause and cause-specific hospitalizations among different migrant groups living in Canada between 2014 and 2018

Presented by: Jenney Wang

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Abstract

Objectives: Increased understanding of migrant health outcomes is important for health policy and planning and to support continuity of care for Canadian newcomers. We examined hospitalization rates among Temporary Residents (TRs) and Permanent Residents (PRs) living in Canada from 2014 to 2018.

Methods: Using the Longitudinal Immigration Database (IMDB), individuals were in the TR cohort if they had a valid TR permit on January 1, 2014. PRs were individuals who had become PRs between 2000 to 2013.

Hospitalization outcomes were obtained by linking the IMDB to the Discharge Abstract Database and the Ontario Mental Health Reporting System. All-cause and cause-specific age-standardized hospitalization rates per 10,000 life years (ASHR) with 95% confidence intervals were calculated for a follow-up period from 2014 to 2018 for PRs, and until their last consecutive TR permit expired or December 31, 2018 (whichever came first) for TRs.

Hospitalization causes examined included mental health and infectious diseases. TRs and PRs were also characterized by age, sex, world region of origin, time since arrival in Canada, immigration stream, and TR to PR transition status. **Results:** The cohort included 23.6% TRs (n = 871,955) and 76.4% PRs (n = 2,824,695). 91% of TRs and 79% of PRs were aged 18-64. The overall ASHR was higher among PRs [375.8 (374.2-377.2)] than TRs [191.3 (188.1-194.5)]. Among TRs, the ASHR was highest for temporary foreign workers [307.3 (288.1-326.6)] and lowest for students [141.6 (124.3-159.0)]. Among PRs, the ASHR was highest for refugees [531.3 (525.0-537.6)] and lowest for migrants in the economic stream [282.4 (279.9-284.9)]. Cause-specific hospitalization results are forthcoming.

Conclusions/Next Steps: Results show ASHR was higher for PRs compared to TRs. ASHR differences may be related to selection criteria by immigrant stream, differential access to healthcare resources, and preventative health behaviours. Forthcoming cause-specific hospitalization results may further explain ASHR differences between migrant groups.

Session ID: C5.1, Cancer Epidemiology (II)

Environmental exposures in urban areas and breast cancer in women less than 45 years of age: initial finding from the Ontario Environmental Health Study

Presented by: Claudia Waddingham

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Abstract

Objectives: Environmental exposures play an important role in the development of breast cancer. Among younger women, breast cancer incidence is increasing and the biological mechanisms through which breast cancer develops differs by menopausal status. Identifying modifiable environmental exposures for pre-menopausal breast cancer such as air pollution, greenness, and nighttime light as risk factors could improve prevention efforts.

Methods: The Ontario Environmental Health Study is a case-control study that collected information from women under 45 years during 2013-2015 for 465 incident breast cancer cases and 242 controls. Environmental exposures were assigned via postal code to women's residential histories using data from the Canadian Urban Environmental Health Research Consortium. Cases were coded for estrogen, progesterone, and human epidermal growth factor receptor 2 (HER2) status. The Normalized Difference Vegetation Index (NDVI) provided of measure of greenness, while satellite data quantified nighttime light. Annual exposure to ambient air pollution (NO₂ and PM_{2.5}) were assigned using a combination of land use regression surfaces and remote sensing data. Multivariable logistic regression estimated the odds of breast cancer in relation to an interquartile range (IQR) increase in environmental exposures. **Preliminary Results:** For age-adjusted models, we observed increased risks of breast cancer for an interquartile range (IQR) increase in NO₂ and nighttime light. Specifically, the odds ratios were 1.93 (95% CI: 1.49-2.50) and 1.12 (95% CI: 1.03-1.21), respectively. In contrast, an IQR increase in NDVI (at a 500m buffer) was associated with a reduced risk of breast cancer (OR = 0.70; 95% CI: 0.57-0.87). **Next Steps:** Preliminary findings suggest environmental exposures of urban built environments are important risk factors for pre-menopausal breast cancer. Additional measures of greenness will be assessed (tree canopy percentage and walkability), as well as PM_{2.5}. We will also explore the mediating role of physical activity on greenness, and risk differences by hormonal receptor status.

Session ID: C5.2, Cancer Epidemiology (II)

Adult lifetime body fatness and the risk of epithelial ovarian cancer

Presented by: Kevin L'Espérance

All Authors: Kevin L'Espérance^{1, 2}, Jennifer A. Ritonja¹, Michal Abrahamowicz³, Vikki Ho^{1, 2}, Belinda Nicolau^{3, 4}, Sreenath Madathil^{4, 5}, Jennifer O'Loughlin^{1, 2}, Anita Koushik^{1, 2}

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Abstract

Background: Body fatness is a probable cause of epithelial ovarian cancer. However, most previous studies provided relative risk estimates for a single measure of body fatness during adulthood, thus little is known about the influence of body fatness changes over the adult lifetime. **Objectives:** We identified trajectories of body mass index (BMI), a surrogate of body fatness, and estimated their associations with ovarian cancer risk in a population-based case-control study in Montreal (498 cases, 908 controls).

Methods: Self-reported height and weight history were used to calculate BMI at ages 20, 30, 40, 50, 60 and 70 years. A group-based trajectory modelling approach was undertaken to determine subgroups of participants with distinct BMI trajectories. Confounders were identified with a directed acyclic graph. Unconditional logistic regression models were used to estimate adjusted odds ratios (OR) and 95% confidence intervals (95% CI) for adult BMI trajectory and ovarian cancer risk. **Results:** Three trajectories emerged: stable-normal (TR1), normal to overweight (TR2) and overweight to obese (TR3). Model adequacy was high, with average posterior probabilities of assignment greater than 0.90, relative entropy of 0.86, and mismatch scores close to 0. Compared with participants in TR1, the adjusted OR (95% CI) was 1.63 (1.00-2.68) for those in TR3 and 0.93 (0.72-1.21) for those in TR2. Additional adjustment for childhood body fatness attenuated the estimate for TR3 (OR=1.45; 95% CI: 0.87-2.43). Associations did not appreciably differ by type of ovarian cancer (borderline vs invasive).

Conclusions: Progressing from overweight to obese from early to later adulthood may increase the risk of epithelial ovarian cancer. Results add to the health benefits of limiting excessive body fatness and suggest early adulthood as a potentially important period for prevention efforts.

Session ID: C5.3, Cancer Epidemiology (II)

The impact of predicted lifetime 25(OH)D throughout adulthood on the risk of ovarian cancer

Presented by: Jennifer Ritonja

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Abstract

Objectives: Some previous studies of serum 25-hydroxyvitamin D [25(OH)D], a biomarker of total vitamin D exposure, and ovarian cancer risk suggest an inverse association. However, these studies measured 25(OH)D at only a single point in time, usually during older adulthood, which fails to consider different timings of exposure throughout adulthood. The objective of this study was to investigate the time-varying effects of 25(OH)D over the adult life in relation to ovarian cancer risk.

Methods: A population-based case-control study was conducted in Montreal, Canada with 490 ovarian cancer cases and 896 controls. 25(OH)D levels were determined using validated prediction models developed by our team. Predicted 25(OH)D scores were computed for each year of life from age 20 to two years prior to study participation. Unconditional logistic regression models were used to estimate adjusted odds ratios (ORs) and 95% confidence intervals (95% CIs). We estimated associations for predicted 25(OH)D score averaged over adulthood, as well as for different periods in the past by using a flexible weighted cumulative exposure (WCE) model. **Results:** Increasing average lifetime 25(OH)D was associated with a reduced risk of ovarian cancer (OR: 0.73 per 20 nmol/L increase, 95% CI: 0.55-0.96). In the WCE model, the inverse association was limited to 5-15 years (OR: 0.86, 95% CI: 0.73-0.98) and 45-60 years (OR: 0.89, 95% CI: 0.83-1.00) prior to study participation. In other time windows, the ORs were near the null. Our results did not change when assessing the influence of selection bias using inverse-probability weighting. Corrections for 25(OH)D measurement errors using SIMEX methodology resulted in slightly stronger estimated ORs, suggesting that predicted 25(OH)D may have underestimated the associations.

Conclusion: Higher predicted 25(OH)D over the adult lifetime was associated with a reduced risk of ovarian cancer, and the impact may be more important during certain time windows.

Session ID: C5.4, Cancer Epidemiology (II)

Exploring Environmental Exposure to Arsenic and Cancer Risk in the Atlantic PATH Cohort using Toxicological and Machine Learning Methods

Presented by: Ellen Sweeney

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Abstract

Objectives: To study environmental arsenic and metallomics exposure and cancer risk using data and biosamples from participants in the Atlantic PATH cohort.

Methods: This research uses toenails as a new biomarker to discover novel differential profiles of arsenic speciation and metallomics among prevalent and incident cases of prostate, breast and skin cancer and sex- and age-matched healthy controls. Further, we take a novel approach of employing machine learning methods to analyze data from toenail biomarker analysis to develop data-driven cancer risk prediction models that will be incorporated within environmental cancer risk assessment tools to detect cancer risk at a population level.

Results or Preliminary Results: Atlantic Canada is an ideal location to conduct this research with elevated concentrations of inorganic arsenic in bedrock, high rates of cancer and approximately half of residents using private wells for drinking water supply. Mean percent monomethylarsonic acid was significantly lower and secondary methylation index was significantly higher in toenails from prevalent prostate cancer cases compared to controls in unadjusted and adjusted models. Proportions of arsenic species were correlated with total arsenic in toenails. Toxicological analyses on prevalent breast and skin cancer cases, and incident prostate, breast and skin cancer cases are underway.

Conclusion or Next Steps: Machine learning methods will use this data to predict the i) likelihood of cancer risk; ii) the type of cancer among breast, prostate and skin cancers; and iii) identify the phenotypic patterns of participants at risk of developing cancer.

Session ID: C5.5, Cancer Epidemiology (II)

Use of vaginal estrogens and subsequent estrogen levels and risk of breast cancer in postmenopausal women participating in the MAP.3 breast cancer prevention trial

Presented by: Harriet Richardson

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Abstract

Objective: To assess the association between vaginal estrogens (VE) (used to treat genitourinary syndrome of menopause (GSM) symptoms) and estrogen levels and breast cancer risk in postmenopausal women randomized to exemestane (EXE) or placebo (PL) in the MAP.3 breast cancer prevention trial.

Methods: Estrone (E1) and estradiol (E2) were quantified in baseline (n=4111) and year-1 (n=3226) serum samples collected from MAP.3 participants using liquid chromatography tandem mass-spectrometry (LC-MS/MS). Year-1 estrogen levels were dichotomized, based on pre-specified thresholds of E1 \geq 1.3pg/ml and E2 \geq 0.5 pg/ml, for the EXE group. VE use was collected at baseline, 6 and 12 months. Tumour blocks from breast cancer events were reviewed by a central pathologist. Generalized linear regression models were used to analyze the association between VE use and i) estrogen levels and ii) breast cancer. **Results:** A total of 264 participants were using VE products at baseline and 66 women developed breast cancer during the trial (20 on EXE and 46 on PL). VE users had significantly higher mean E1 (β =3.08 pg/ml, 95% CI: 1.42, 4.74) and E2 (β =2.10 pg/ml, 95% CI: 1.56, 2.64) levels than nonusers at baseline. Among the EXE group, continuous VE users (n=99) had an increased risk (OR=1.83, 95% CI: 1.45, 2.32) of having E1 and E2 levels \geq pre-specified threshold at year-1. However, continuous VE use (n=209) was not significantly associated with breast cancer in either the PL group (OR=1.34, 95% CI: 0.47-3.83) or in the EXE group (OR=1.78, 95% CI: 0.40-8.01).

Conclusions: VE users had higher E1 and E2 levels at baseline and follow-up compared to non-users. While there was no statistically significant association between VE use and breast cancer, this question should be further investigated in larger studies with better precision.

Session ID: C6.1, Occupational Epidemiology

Nokiiwin Tribal Council Community Survey- Understanding healthy workplace factors in the Indigenous context

Presented by: Vicki Kristman

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Abstract

Background/objectives: This study was conducted to help us understand the important factors for a healthy workplace in the context of the Indigenous population. We aim at determining the most important workplace factors to help us later conduct a scoping review to identify interventions to improve these important factors by looking at both indigenous and non-indigenous populations.

Methods: In partnership with the Nokiiwin Tribal Council (NTC), we surveyed community members aged 15 years older at various 2017-2018 events using electronic and paper-based surveys. Of those who were working, we examined the following workplace factors: global safety at work, workplace social capital, discrimination, interpersonal conflict at work, family work conflict, supervisor & coworker support, and job stress for their association with the following outcomes: engagement, presenteeism, absenteeism and job satisfaction. **Results:** Out of the 171 participants, 149 (87.1%) completed the survey. Using bivariable regression, we found that interpersonal conflict at work was associated with social engagement ($\beta = -0.15$; 95% CI -0.26, -0.05) and presenteeism ($\beta = -0.80$; 95% CI -1.39, -0.22). The family work conflict was associated with overall engagement ($\beta = -0.15$; 95% CI -0.27, -0.03) and absenteeism ($\beta = 1.63$; 95% CI 1.09, 2.43). Job stress was associated with overall engagement and job satisfaction. Different levels of supervisor and coworker support were also associated with engagement and absenteeism.

Conclusion: We learned that lower interpersonal conflict at work and family work conflict, followed by higher supervisor & co-worker support and job control were the most important healthy workplace factors in the Indigenous population.

Session ID: C6.2, Occupational Epidemiology

Exploring the Etiology of Rare Cancers Using a Large Multi-Ore Mining Cohort

Presented by: Paul Demers

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Abstract

Objectives: The ability of cohort studies to investigate rare cancers is often limited due to power, length of follow-up, or access to cancer registry data. This study examines exposure patterns for nasal, nasopharyngeal, salivary gland, and bone cancer using a large multi-ore mining cohort.

Methods: From 1928-1988 underground miners in Ontario, a region where gold, uranium, nickel, and other ores are mined, were required to undergo an annual medical exam, and record their mining work history to receive certification. These data were used to create the Mining Master File (MMF) cohort. Cancers were identified through linkage with the Ontario Cancer Registry (1964-2017). Cancer risk among miners was compared to the general population using Standardized Incidence Ratios (SIR) and between groups of miners in the cohort using Poisson regression. **Results:** The cohort consisted of 61,397 male miners. Nasal cancer was somewhat elevated (48 cases, SIR=1.44, 95% confidence Interval (CI)=1.06-1.91) but the observed excess was largely localized to miners who had the majority of employment in nickel mines (SIR=2.09, CI=1.37-3.06). Nasopharyngeal cancer was similarly elevated (44 cases, SIR=1.42, CI=1.03-1.91) but in contrast the excess risk was limited to gold mining (SIR=2.70, CI=1.57-4.33). Bone cancer was clearly elevated (58 cases, SIR=1.91, CI=1.45-2.47), with ore-specific elevations seen among uranium (SIR=2.46, CI=1.22-4.40) followed by nickel mining (SIR=2.04, CI=1.29-3.06). Salivary gland was only slightly elevated (54 cases, SIR=1.09, CI=0.82-1.42), but the risk among uranium miners exposed to radon was high (SIR=2.97, CI=1.81-4.59) and increased monotonically with employment duration.

Conclusions: This analysis demonstrated the power of this cohort to identify associations for rare cancers. The association of nickel with nasal cancer was expected and Gamma radiation is associated with bone and salivary gland cancer, but levels in uranium mines are believed to be low. Other associations were surprising and warrant further investigation.

Session ID: C6.3, Occupational Epidemiology

Long working hours and the increased coronary heart diseases incidence: 24-year prospective cohort study

Presented by: Raouaa Braiki

All Authors: Raouaa Braiki¹, Azita Zahiriharsini², Trudel Xavier³, Denis Talbot³, Mathilde Lavigne-Robichaud⁴, Peter Smith⁵, Chantal Brisson², Alain Milot⁶, Caty Blanchette⁷, Mahée Gilbert-Ouimet²

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Abstract

Objective: Coronary heart disease (CHD) is the leading cause of premature death for women in Canada. Despite that, two-thirds of global heart disease research still focuses on men. Long working hours (LWH) may increase the risk of CHD incidence more steeply in female than male workers. However, sex (biological) and gender (sociocultural) differences have been poorly examined by previous prospective studies. This study aims to examine sex and gender differences and similarities in the associations between LWH and the 24-year CHD incidence.

Methods : Data from a prospective cohort of white-collar workers in Canada (n= 5192; 50% women) were used. LWH were defined as working ≥ 41 hours per week. LWH were measured by a question to identify the average weekly worked hours of respondents' paid job. Medical administrative databases were used to assess CHD incidence using validated algorithms. Semi-parametric Cox proportional model with age as time scale and delayed entry at age at study baseline was used to calculate conditional hazards ratios (HR) stratified by sex and gender (feminine, intermediate, masculine), and by sex- and gender-related variables (e.g. menopausal status and occupational title). **Results:** Both females and males working ≥ 41 h had a higher HR risk of CHD incidence (HR:1,47, 95% CI 0.95-2.28 and HR: 1,16, 95% CI 0.91-1.46, respectively). Among female workers, the association between LWH and CHD incidence was amplified by the following sex- and gender-related factors: hormone replacement therapy (HR: 2,09, 95% CI 0.97-4.50) and menopausal status (HR: 2,08, 95% CI 0.97-4.44), being an office or a technical worker (HR: 1,67 95% CI 1.17-2.38) and being married or in a relationship (HR: 1,37 95% CI 1.08-1.73).

Conclusion: More considerations of sex and gender differences in research and prevention efforts aimed to reducing LWH effects could help lower the risk of CHD incidence among women and men.

Session ID: C6.4, Occupational Epidemiology

Stresseurs psychosociaux au travail et incidence de la fibrillation auriculaire: une étude prospective de 18 ans

Presented by: Edwige Tiwa Diffo

All Authors: Edwige Tiwa Diffo¹, Alain Milot², Mathilde Lavigne-Robichaud³, Mahée Gilbert-Ouimet³, Michel Vézina¹, Denis Talbot³, Chantal Brisson³, Xavier Trudel³

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Abstract

Introduction: L'effet néfaste des stresseurs psychosociaux au travail des modèles job strain et du déséquilibre efforts-reconnaissance (DER) au travail sur la santé cardiovasculaire est bien documenté. Aucune étude antérieure n'a examiné l'effet du DER, ni l'effet d'une exposition combinée à ces deux stresseurs sur le risque de développer une fibrillation auriculaire. L'objectif de cette étude était d'examiner l'effet indépendant et combiné de l'exposition au job strain et au DER sur l'incidence de la fibrillation auriculaire. **Méthode:** Le devis est une étude de cohorte prospective. La durée de suivi était de 18 ans. La population étudiée se composait de 5926 employés cols blancs (3021 femmes et 2905 hommes) exempts de maladies cardiovasculaires au départ. Les stresseurs psychosociaux au travail des deux modèles ont été mesurés à l'aide d'instruments validés. Un algorithme utilisant les fichiers médico-administratifs a été utilisé pour la détection des cas de FA. Les rapports de risque (hazard ratio) et les intervalles de confiance à 95 % ont été estimés à l'aide de modèles de régression de Cox, ajustés en fonction des caractéristiques socio-économiques, des facteurs liés aux habitudes de vie et des facteurs cliniques. **Résultats:** Au total, 186 cas incidents de FA ont été identifiés durant le suivi. L'exposition au job strain et au DER augmentait le risque de FA de 65 % (HR=1,65 ; IC 95 % 1,15-2,35) et de 44 % (HR=1,44; IC 95 % 1,05-1,98) respectivement dans les modèles ajustés pour l'ensemble des covariables. L'exposition combinée au job strain et au DER était associée à une augmentation accrue de l'incidence de la FA de 97 % (HR=1,97; IC 95 % 1,26-3,07).

Conclusion: L'étude suggère que l'exposition séparée et combinée au job strain et au DER augmente le risque de survenue de la FA. Des interventions visant à réduire l'exposition à ces stresseurs psychosociaux pourraient contribuer à améliorer la prévention primaire de la FA.

Session ID: C6.5, Occupational Epidemiology

Sex and gender considerations in the associations between psychosocial stressors at work and coronary heart diseases incidence: 20-year prospective cohort study

Presented by: Azita Zahiriharsini

All Authors: Azita Zahiriharsini¹, Mathilde Lavigne-Robichaud², Trudel Xavier², Denis Talbot², Peter Smith³, Chantal Brisson², Alain Milot², Caty Blanchette², Mahée Gilbert-Ouimet¹

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Abstract

Objective: Psychosocial stressors at work (PSW) are modifiable occupational risk factors associated with an increased risk of coronary heart diseases (CHD) incidence. According to systematic reviews, the effects of these occupational risk factors on CHD may be different across sexes and gendered characteristics. However, sex (biological) and gender (sociocultural) differences have been poorly examined. The study aimed at evaluating sex and gender differences in the associations between PSW and CHD incidence.

Methods: A total of 6,465 white-collar females and males from Quebec were followed up 20-years. Job strain and efforts-reward imbalance (ERI) models were used to define PSW. These PSW were measured using self-administered questionnaires. Incident cases of CHD were retrieved from medico-administrative databases using validated algorithms. Cox proportional models allowed to calculate hazard ratios (HR) for the associations between PSW and CHD incidence, stratified by sex, a gender index, and by sex- and gender-related variables (e.g. occupational title). **Results:** Combined exposure to job strain and ERI increased the risk of CHD in males [HR: 2.03 (1.53-2.70)] but not in females [HR: 0.69 (0.40-1.18)]. This combined exposure also increased the risk of CHD in presence of masculine characteristics, such as holding a university degree [HR: 1.61 (1.14-2.28)], being professional workers and managers [HR: 1.68 (1.18-2.37)], being married [HR: 1.58 (1.19-2.09)], having a low children load [HR: 1.75 (1.28-2.39)], having a perceived high income [HR: 1.44 (1.10-1.89)] or low income [HR: 2.33 (1.11-4.90)], and being masculine according to a gender index [HR: 1.87 (1.27-2.74)].

Conclusions: In this study, males and participants with masculine characteristics exposed simultaneously to job strain and ERI were at increased risk of CHD over the 20-year follow-up. These results highlight the importance of sex and gender considerations in occupational researches on CHD, as well as in developing strategies for workplace intervention and public health prevention.

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