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Abstract Book

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TITLE: Association Between Bullying Victimization and Perpetration and Prolonged Screen Time, and The Moderating Effect of Peer Support: A Two-Year Follow-Up Study

ABSTRACT:

This study aims to investigate the prospective association between bullying victimization and perpetration and prolonged screen time in adolescents, while also evaluating social support as a potential moderator in this association.

A two-year prospective study was conducted among 4,752 7-9th Grade students without prolonged screen time (≥ 4 hours/day) at baseline, using data from The Taiwan Adolescent to Adult Longitudinal Study (TAALS). Students reported baseline information on bullying victimization and perpetration, social support, and demographic characteristics, with prolonged screen time data utilized from the follow-up. Logistic regression models were employed to assess the impact of bullying victimization or perpetration on prolonged screen time while controlling for baseline demographic characteristics and social support. Additionally, we incorporated two-way interactions between bullying experience and social support (i.e., peer and family) into these models to assess moderating effects.

Results indicated that 22.16% of adolescents developed prolonged screen time at the two-year follow-up. Victims of verbal bullying or cyberbullying at baseline significantly increased the risk of prolonged screen time at follow-up. Perpetrators of physical, verbal, and cyberbullying at baseline were identified as independent risk factors for prolonged screen time at the follow-up. Peer support emerged as a moderator between relational bullying perpetration experience and prolonged screen time, revealing a significantly increased risk among participants with higher peer support.

These findings underscore the importance of addressing specific types of bullying victimization and perpetration experiences for the prevention and intervention of prolonged screen time among middle school students. Specifically, for students with high peer support, addressing relational bullying perpetration becomes a crucial factor in mitigating the risk of prolonged screen time.



TITLE: Development of a predictive model for preterm birth: Analysis of the Brazilian Live Birth Information System (SINASC)

ABSTRACT:

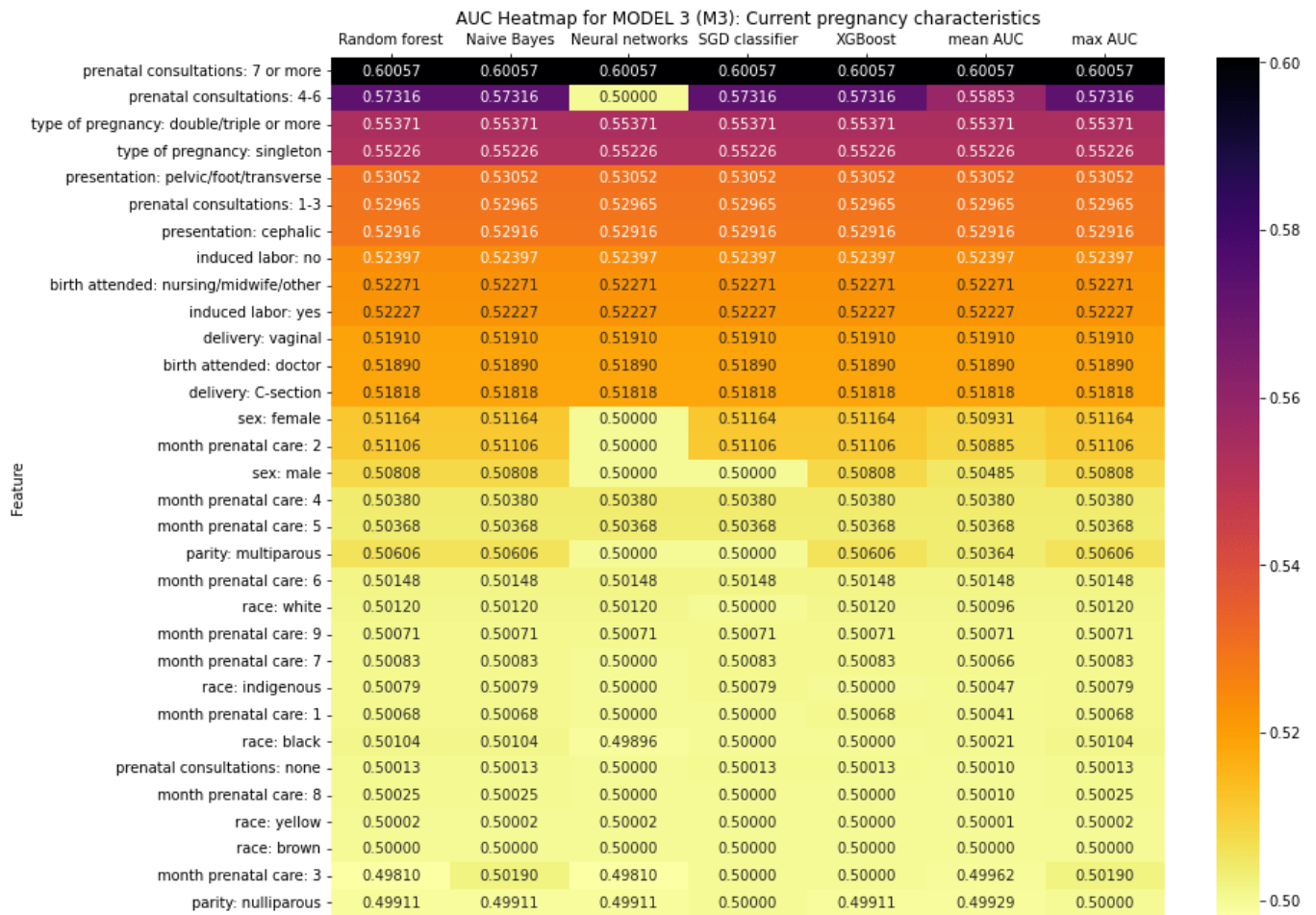
The study utilized SINASC dataset to explore risk factors associated with preterm birth. The aim was to apply machine learning techniques to identify associations between explanatory variables and preterm birth.

Five machine learning models (Random Forests, Naive Bayes Classifier, Stochastic Gradient Descent Classifier, XGBoost, and Artificial Neural Networks) were used. The models' performance was assessed using a 'kitchen sink' approach. The neural network model performed the best, with an AUC of 0.6942, indicating its acceptable predictive ability.

K-fold cross-validation was implemented for more reliable results, reducing variance and bias. The AUCs for the various included predictors were analysed, with prenatal consultations, pregnancy type, baby's presentation, and mother's age emerging as the most predictive factors.

A heatmap was created to visually represent the AUC scores across different models and features. Higher prenatal consultations correlated with increased risk of preterm birth, potentially due to complications requiring close monitoring. This was apparent in both the full model and a second model which only included current pregnancy characteristics. Pregnancy type and presentation also showed significant predictive power. In terms of correlation between the predictive variables, the correlation between C-section delivery and births attended by doctors showed moderate positive correlation.

The study concluded that no single variable could strongly and solely predict preterm birth. The "current pregnancy characteristics" showed the best predictive ability. Preterm birth is influenced by various determinants across multiple levels (biological, individual, socioeconomic, national, etc.) which in themselves impact one another. This study highlights the importance of comprehensive data collection on all potential determinants and risk factors and a multilevel life course perspective for better understanding and prediction of preterm birth occurrences.



TITLE: Evaluating the Use of Event Metadata Extracted from Online News Media for Disease Outbreak Detection

ABSTRACT:

Digital disease surveillance (DDS) uses internet-based data to detect and monitor health threats. DDS leverages advanced techniques to extract structured event metadata of event entities such as whether an event was caused by an unclassified pathogen. Our study aims to understand the data properties of event metadata and explore the use of a self-controlled case series design to assess the temporal association of event entities and the emergence of the Omicron variant. We obtained COVID-19 event metadata between October 1 and December 31, 2021, from a DDS system, BioCaster, and daily counts of Omicron-positive genome samples for the same period from the Global Initiative on Sharing All Influenza Data. Countries with detected change points in at least one entity were included. For each country, the emergence of the Omicron variant was identified based on genome counts using Bayesian change point analysis. We defined a risk period of 9 days following each emergence and included an 18-day pre-exposure period to address potential assumption violation, as more genome samples may be collected after news reporting a new variant. Conditional Poisson regression was used to estimate the relative incidence (RI) and its 95%CI. Given the significant media attention garnered by the World Health Organization's announcement regarding the identification of the Omicron variant, we conducted a secondary analysis with a truncated study period until November 25, 2021, to eliminate the potential impact of the announcement. During the study, 67 countries were included. The number of changes detected from different entities varied from 19 to 419. No increasing incidence of changes in any entity was identified. However, after shortening the study period, increased RIs were found for the entity indicating events caused by unclassified pathogens (2.24 95%CI 1.03, 4.84). These findings highlight the potential of online news media for signalling the emergence of significant infectious diseases.

TITLE: Body Mass Index is Positively Associated with Overall Cancer Risk Among College Students in the United States: Results from the National College Health Assessment

ABSTRACT:

Background: To understand the dose-response relation between body mass index (BMI) and cancer, as well as the associations between overweight/obesity and overall cancer risk in US college students, we conducted the first epidemiologic study to examine these associations using data from the American College Health Association-National College Health Assessment (ACHA-NCHA).

Method: The ACHA-NCHA provided self-reported data on demographic information, physical activity, BMI, smoking status, and overall cancer during 2019-2022 (n=275,185; 0.08% cancer cases). A cubic spline model and logistic regression analyses were used to evaluate associations between BMI and cancer risk adjusting for covariates.

Result: The cubic spline observed that BMI (kg/m²) was positively associated with the odds of overall cancer risk after adjusting for age, sex, race, ethnicity, education level, physical activity, and smoking status (P for linear relation=0.02 and P for overall association<0.0001); a one kg/m² increase in BMI was associated with a 1% increased overall cancer risk. Multivariable-adjusted logistic regression analyses showed that overweight ($25 < \text{BMI} \leq 30$ kg/m²) [odds ratio (OR): 1.20 (95% confidence interval (CI): 1.08-1.34)], and obesity ($\text{BMI} \geq 30$ kg/m²) [1.48 (1.32-1.65)] were positively associated with cancer risk.

Conclusion: BMI, especially overweight/obesity, may be positively associated with overall cancer among college students in the US. To reduce cancer risks, targeted interventions to keep healthy weight among college students are warranted.

TITLE: The causal effect of immunosuppressive agents on cancer risk among solid organ transplant recipients: A Bayesian machine learning approach

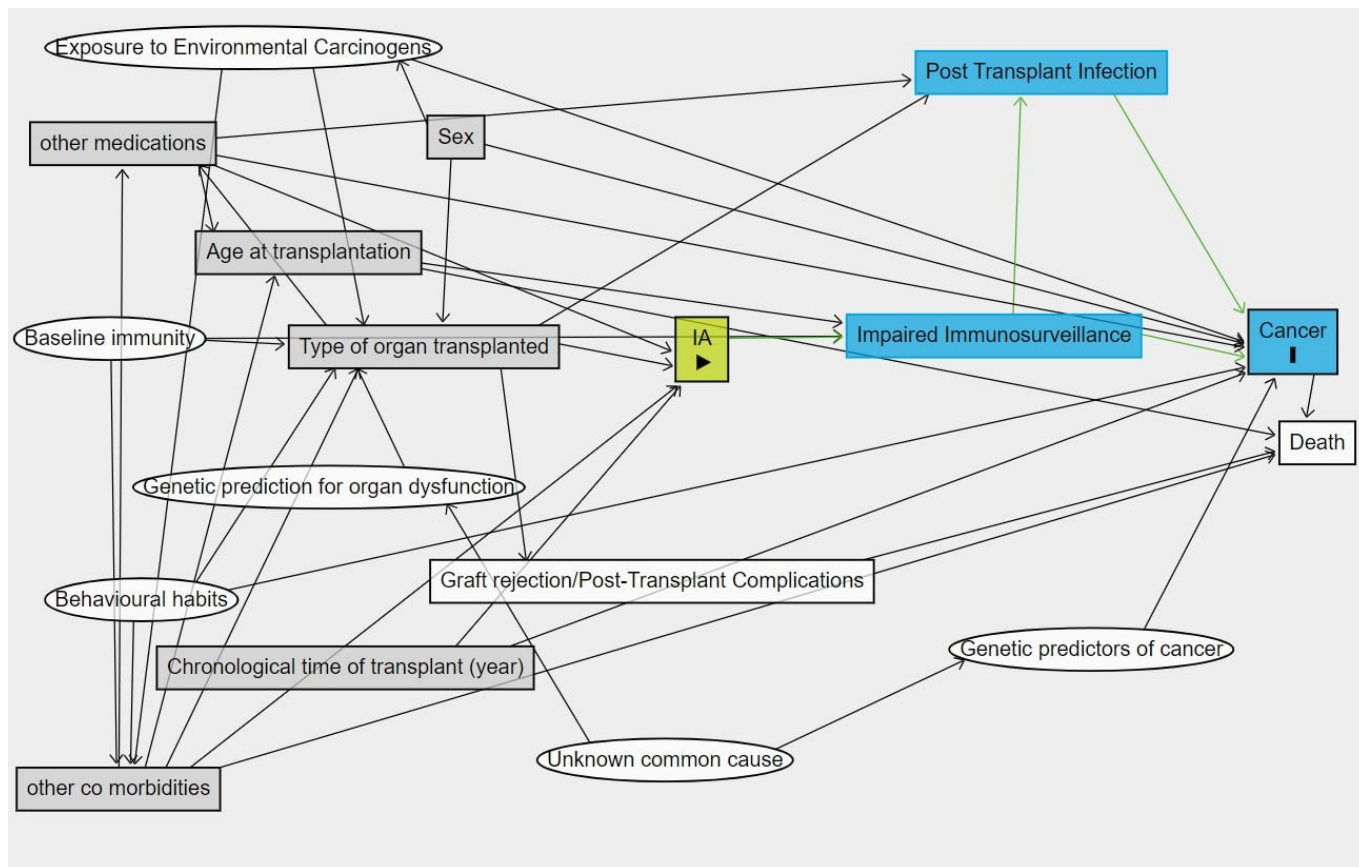
ABSTRACT:

Background: Solid organ transplant recipients (SOTR) have a higher risk of cancer compared to the general population. Immunosuppressive agents (IAs) play a crucial role in preventing organ rejection because of their effect on immune system inhibition. There has been an interest in IAs increasing the risk of cancer, but the causal effect of different long-term IAs on malignancy risk is poorly understood. Our objective is to estimate the causal effect of IAs on lifetime cancer risk among SOTRs using a machine-learning approach.

Methods: Linking two administrative databases from Quebec, we constructed a retrospective cohort study of SOTR from 1997 to 2016 with a maximum follow-up of 20 years. SOTR were identified using procedure codes from the provincial health insurance database: the Régie de l'assurance maladie du Québec (RAMQ). Incidence of de novo malignancy was ascertained using the validated algorithm that uses ICD codes from the hospital discharge database of Quebec: Maintenance et exploitation des données pour l'étude de la clientèle hospitalière (MED-ECHO). We will use Bayesian Additive Regression Trees (BART), a non-parametric machine learning approach to estimate the conditional average treatment effect of IAs on the lifetime risk of cancer. BARTs have shown to be more robust against model misspecification compared to standard parametric causal modelling approaches.

Results: As preliminary results, we identified 6873 SOT recipients, among which 1142 patients developed primary cancer. Melanoma and malignant neoplasm of the skin was the common cancer among SOTR.

Conclusion: We will present our work on the BART approach to estimate the effect of IAs on the lifetime risk of cancer.



TITLE: State-specific and Socio-demographic Disparities in Breast Cancer Screening Among US Women

ABSTRACT:

Introduction

Breast cancer remains a leading cause of cancer death among American women. Early detection of breast cancer through screening plays a crucial role in facilitating more manageable and effective treatment. Here, we examined state-specific and socio-demographic disparities in adherence to the US Preventive Services Task Force (USPSTF) guidelines for breast cancer screening.

Methods

Data came from 105,833 US women aged 50-74 years who participated in the 2022 Behavioral Risk Factor Surveillance System and self-reported biennial mammography screening adherence as USPSTF recommended. Weighted frequencies were calculated to assess breast cancer screening rates by US states, territories, and demographic factors. Multivariable log-binomial regression models were employed to estimate the factors associated with meeting USPSTF breast cancer screening guidelines. Adjusted OR (AORs) with 95% CI were reported.

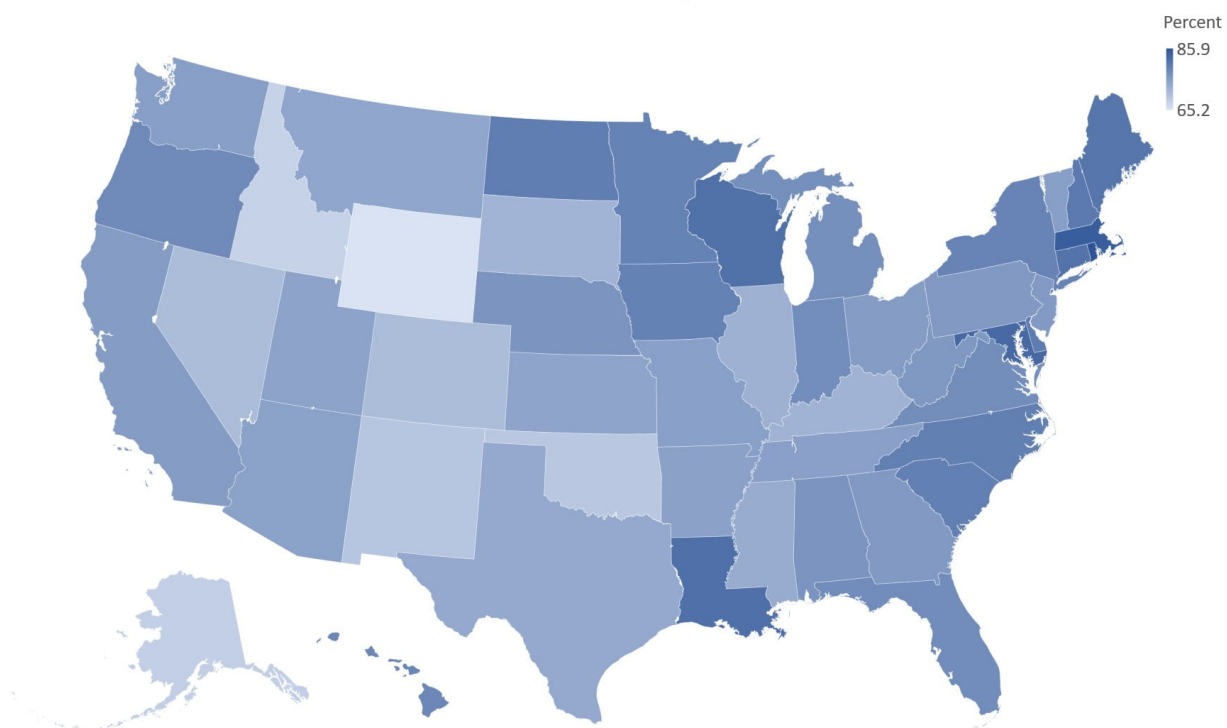
Results

Among women at average risk for breast cancer, 76.5% (estimated 36.7 million) met the breast cancer screening guidelines, with Rhode Island (85.9%) having the highest prevalence and Wyoming (65.2%) lowest prevalence among US states (Figure 1). Among those who met screening guidelines, 62.1% were in the age range of 50 to 64, 67.4% identified as non-Hispanic white, and 84.3% resided in metropolitan counties (urban vs rural). The regression model revealed that Hispanic (AOR=1.39; 95%CI:1.16-1.66; p=0.0004) and non-Hispanic Black (AOR=1.70; 95%CI:1.50-1.93; p<.001) women demonstrated greater adherence to USPSTF guidelines compared to their non-Hispanic White counterparts. Women with high school or above education (vs <high school; AORs ranged 1.43-1.78; ps<.05), those with an annual income of 35k and above (vs <35k; AORs ranged 1.25-1.82; ps<.05) and insured (vs uninsured; AOR=3.95; 95%CI:3.23-4.83; p<.001) were more likely to adhere to the USPSTF guideline. Women who were American Indian or Alaska Native (AOR=0.61; 95%CI:0.42-0.89; p=0.01), had self-reported disability (AOR= 0.80; 0.73-0.88; p<.001) and avoided medical care because of cost (AOR= 0.61;95%CI:0.52-0.71; p<.001) were at greater risk of not adhering to the guideline. While retired (vs unemployed: AOR=1.27; 95%CI:1.04-1.54; p=0.01) women were more likely to adhere to the guideline, there were no significant differences among employed women or by their metropolitan counties (ps>0.05).

Conclusions

Over 75% of US women between ages 50-74 met breast cancer screening guidelines but with notable disparities. Hispanics and non-Hispanic Black women showed higher adherence, while lower education, income, cost-related medical care avoidance, and disability were linked to lower guideline adherence. Essential policy interventions are needed to ensure equitable access, early diagnosis, and, ultimately, to save lives through improved breast cancer screening

Figure 1. Breast Cancer Screening based on USPSTF* guidelines among US states and territories, BRFSS* 2022



*USPSTF=US Preventive Services Task Force; BRFSS=Behavioral Risk Factor Surveillance System

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TITLE: Associations of IGF-1 and IGFBP-3 with expression of CD44, CD24, and ALDH1A1 stem cell markers in benign breast biopsies

ABSTRACT:

Purpose: Elevated plasma insulin growth factor-1 (IGF-1) and IGF binding protein-3 (IGFBP-3) are associated with increased breast cancer (BCa) risk. The IGF pathway is implicated in a naturally occurring process of tissue remodeling during which cells acquire stem cell-like characteristics. We examined associations of circulating IGF-1 and IGFBP-3 with expression of CD44, CD24, and ALDH1A1 stem cell markers in women with benign breast biopsies.

Methods: This study included cancer-free women with incident biopsy-confirmed benign breast disease within the Nurses' Health Study II who also provided blood samples between 1996 and 1999. The data on reproductive and other BCa risk factors were obtained from biennial questionnaires. Immunohistochemistry (IHC) was done on tissue microarrays. The study included 148, 143, and 145 women for CD44, CD24, and ALDH1A1, respectively. For each core, the IHC expression was assessed using QuPath, and expressed as % of cells that stain positively for a specific marker out of the total cell count. Generalized linear regression was used to examine the associations of plasma IGF-I and IGFBP-3 (continuous log-transformed and quartiles) with log-transformed expression of each marker (in epithelium and stroma), adjusted for BCa risk factors.

Results: In multivariate analysis, continuous circulating IGF-1 and IGFBP-3 measures were not associated with the expression of any of the markers in the epithelium or stroma. Women whose IGFBP-3 levels were in the top quartile had lower expression of stromal CD24 compared to those in the lowest quartile ($\beta = -0.36$, 95% CI $-0.68, -0.04$, $p\text{-trend} = 0.01$).

Conclusions: Higher circulating IGFBP-3 levels were associated with lower stromal CD24 expression in benign breast tissue. As stem cells are characterized by higher CD44/lower CD24 expression, these findings could support the hypothesis of inducing effect of IGF pathway on stem cell activity in the breast. Future studies are needed to confirm our findings.

TITLE: Associations of reproductive factors with expression of CD44, CD24, and ALDH1A1 stem cell markers in benign breast biopsies

ABSTRACT:

Purpose: Reproductive factors are known to affect breast cancer risk. Whether these factors could influence activity of breast stem cells linked to breast cancer risk is unclear. We examined the associations of reproductive factors with stem cell markers CD44, CD24, and ALDH1A1 in benign breast biopsies.

Methods: This study included cancer-free women with incident biopsy-confirmed benign breast disease within the Nurses' Health Study II. The data on reproductive and other breast cancer risk factors were obtained from biennial questionnaires. Immunohistochemistry (IHC) was done on tissue microarrays. The study included 728, 714, and 717 women for CD44, CD24, and ALDH1A1, respectively. For each core, the IHC expression was assessed using QuPath, and expressed as % of cells that stain positively for a specific marker out of the total cell count. Generalized linear regression was used to examine the associations of parity, age at 1st birth, breastfeeding, age at menarche, and the time between menarche and age at 1st birth with log-transformed expression of each marker (in epithelium and stroma), adjusted for other breast cancer risk factors.

Results: In multivariate analysis, age at 1st birth was inversely associated with ALDH1A1 expression in epithelium (β for ≥ 30 vs. < 25 years = -0.30, 95% CI -0.57, -0.03, p-trend=0.03). Parity, breastfeeding, age at menarche and the duration of the interval between menarche and 1st birth were not associated with the expression of any of the three markers in epithelium or stroma.

Conclusions: Later age at 1st birth (linked to greater breast cancer risk) may be associated with lower ALDH1A1 epithelial expression in benign breast tissue (consistent with lower activity of stem cells in the breast), in contrast to our a priori hypothesis of higher expression of stem cell markers in women with later age at 1st birth. Future studies are needed to confirm our findings.

TITLE: Incidence and Outcomes of Out-of-Hospital Cardiac Arrest Across Canada: A 5-year Population-based Cohort Study

ABSTRACT:

Introduction: Despite substantial treatment advances and public health investment, out-of-hospital cardiac arrest (OHCA) remains a prominent medical concern worldwide. Currently, no population-based studies have evaluated the burden of OHCA across Canada.

Objective: To evaluate geographical differences in OHCA incidence and outcomes across Canada.

Study Design: Population-based retrospective cohort.

Methods: Using health administrative databases, a total of 10,492 non-traumatic OHCA patients aged 2-85 years that were admitted to an acute care hospital in any Canadian province or territory (excluding Quebec) between 2013 and 2017 were included. The primary outcome was survival to hospital discharge. Age- and sex-standardized incidence rates (per 100,000) were calculated through direct standardization to the 2016 Canadian population. Temporal trends in outcomes were compared using the Cochrane-Armitage trend test.

Results: Most included OHCA patients were male (66.3%), with a mean age of 63.5 (SD: 14.9) years. Among Canadian provinces, the 5-year age- and sex-standardized incidence was highest in British Columbia (45.1), Nova Scotia (44.1), and Manitoba (43.8), whereas incidence was lowest in New Brunswick (31.8) and Prince Edward Island (33.2). Over the 5-year period, the proportion of OHCA patients that survived to hospital discharge was highest in Prince Edward Island (56.9%) and lowest in Ontario (38.3%), with a national average of 43.1%. No significant trend in survival to hospital discharge was observed from 2013 (43.1%) to 2017 (44.4%; $p=0.91$) in Canada. Figure 1 displays the proportion of OHCA patients that survived to hospital discharge by year, stratified by province/territory, age group, and sex.

Conclusion: Considerable variation in the incidence of OHCA patients admitted to hospital exists across Canada. Minimal improvements in survival after OHCA was observed nationally from 2013 to 2017.



Figure 1. Survival to hospital discharge (y-axis) by year (x-axis) among OHCA patients transported to hospital alive in Canada (excluding Quebec) from 2013 to 2017. Graphs are stratified by (A) Province/territory (data from PE, YT, NW, and NU were excluded due to small cell restrictions); (B) Stratified by age group in years; (c) Stratified by sex. AB: Alberta, BC: British Columbia, MB: Manitoba, NB: New Brunswick, NL: Newfoundland and Labrador, NS: Nova Scotia, NT: Nunavut, NW: Northwest Territories, OHCA: out-of-hospital cardiac arrest, ON: Ontario, PE: Prince Edward Island, SK: Saskatchewan, YT: Yukon Territory.

TITLE: Estimating SARS-Cov-2 cumulative infection attack rates over time via serology and wastewater surveillance

ABSTRACT:

Background: Tracking SARS-CoV-2 infections in the general population has been challenging since the post-Omicron relaxation of most public health and social measures. We estimated Omicron's cumulative infection attack rate in Hong Kong from January 2022 to August 2023 via a multi-year community-wide sero-epidemiology survey.

Methods: We collected 6,953 sera from 2,693 individuals (aged 1-72 years, unvaccinated or vaccinated with the mRNA BioNTech (BNT) vaccine (Original Monovalent and/or Bivalent), each with between 2 to 6 longitudinal samples) using our validated in-house ELISA assay detecting IgG antibodies to the C-terminal domain of the nucleocapsid (N) protein (N-CTD) of SARS-CoV-2. We then calibrated our serological results against wastewater SARS-CoV-2 viral load per capita over time - a proxy for the community-wide force of infection - and jointly estimated the magnitude of infection-related anamnestic "boosting" of anti-N antibody levels, waning over time of N-CTD assay responses and monthly infection attack rates, corrected for measurement variability, via a Markov-Chain Monte Carlo framework using the serosolver package. We assumed waning followed a bi-phasic double-exponential decay process, and uniform priors for the boosting, waning and error parameters.

Results: We preliminarily estimated that, up to August 2023, the cumulative infection attack rate in Hong Kong, as observed amongst BNT-vaccinated and unvaccinated individuals, was approximately 165% (**Figure 1**).

Conclusion: Each person in Hong Kong experienced an average of 1.65 infections over 20 months and 3 successive waves since January 2022. Integrating sero-epidemiological and wastewater surveillance allows more for accurate tracking of the long-term dynamics of Covid-19 in the general population.

TITLE: Chronic diseases and long COVID in a city in the south of Brazil: a cohort study

ABSTRACT:

Introduction

Previous studies of the Cohort “Emergency Department use and Artificial Intelligence in Pelotas” (EAI Pelotas) demonstrated a higher risk of long COVID among people with multiple long-term chronic conditions, with a dose-response relationship. Understanding whether this relationship is due to accumulation of diseases or of certain isolated diseases is relevant to the focus of public policies. Therefore, the aim of this study was to assess the risk of COVID across several chronic conditions.

Methods

A longitudinal study was carried out with baseline data collected in 2021 and follow-up data in 2022 from the EAI Pelotas cohort. During the follow-up, 19 long COVID symptoms that lasted two months after infection were identified. Among them, hair loss, shortness of breath, dry cough, loss of taste, tiredness, nausea/vomiting, diarrhea, muscle pain, memory loss and others. The exposure were 21 chronic conditions listed at the study baseline, including cardio-metabolic, musculoskeletal, respiratory and mental health morbidities. Poisson regression was performed, with results reported as RR, with 95% CI, adjusted for sex, age, skin color and education.

Results and discussion

1,222 adults and elderly people who reported having contracted infection with the SARS-CoV-2 virus were interviewed. The average age was 45.1 years. Only two of the 21 conditions assessed were associated with long COVID in the adjusted analysis. Compared to individuals without glaucoma, those who reported the disease presented a 44% (95% CI: 1.12-1.83) greater risk of developing long COVID. The risk of long COVID was 29% (95% CI: 1.09-1.53) among participants with osteoporosis.

In isolation, only two diseases were associated with the risk of long COVID. The results suggest that long COVID is more associated with the accumulation of morbidities (multimorbidity) than specific diseases, indicating the need for public policies focusing on people with a greater accumulation of diseases.

TITLE: The cost-effectiveness of international travel measures during COVID-19 in Canada

ABSTRACT:

Objective

During the COVID-19 pandemic, virtually all countries implemented international travel measures (ITMs) to reduce the introduction of SARS-CoV-2 and its onward transmission into their domestic populations. However, the prolonged use of highly varied and frequently changing measures by governments generated much controversy and likely had unintended consequences on economic, social, and health outcomes.

Although the existing literature documents a multitude of impacts from ITMs, our team's scoping review, which focuses on economic impacts, reveals a few research gaps. First, existing studies largely focus on the most severe types of ITMs, for example border closures, while softer measures such as quarantine requirements and border screening are understudied. Second, the inconsistent usage of terminology when studying ITMs makes it difficult to compare results across studies and draw overarching conclusions. Third, existing ITM datasets often do not contain full and detailed information on travel measures, making it hard to distinguish the effect of different types of measures. Fourth, many studies fail to distinguish the effects of ITMs from the pandemic itself and other non-pharmaceutical interventions (NPIs), which could lead to biased estimates of the impact of travel measures.

This study aims to fill a gap in the existing literature by providing empirical evidence on the cost-effectiveness of COVID-19 ITMs, using data from Canada. Employing a unique dataset built by our research team, we categorize different types of ITMs implemented in Canada during the pandemic. We then qualitatively identify important policy windows, short time periods over which Canada enacted or removed a set of ITMs. We treat each policy window as a single event and estimate its impact.

Our empirical analysis takes two steps. First, we estimate the impact of ITMs on tourism, measured as inbound traveller volume. Next, we employ a genome sequence diversity index to study the effectiveness of ITMs in preventing new COVID-19 variants from entering Canada.

Taken together, these empirical exercises reveal information about on the economic costs (reduced travellers) and public health benefits (importation of new variants) of Canada's ITMs during the pandemic.

We hope that this empirical evidence on the impact of ITMs during the COVID-19 pandemic can inform policy makers in the event of future public health crises. Moreover, our study suggests a new dataset and empirical method for the future study on ITMs.

Methods

This is a quantitative study. Data on the ITMs is collected and digitized by the Pandemic and Borders project. Each observation relates to a specific policy change. Policy changes are coded into nine different categories based on the ITM type (travel restrictions, quarantine, health screening, travel advisories, etc.). Each policy change is further defined by one of five update types: new, extension, increase, decrease, and end. Also identified is the targeted country and demographics of each ITM. Finally, there's an indicator for whether each policy applies to the vaccinated population or not. To

our knowledge, this is the most detailed and comprehensive dataset on ITMs adopted during the COVID-19 pandemic in Canada.

Data on the genome sequence diversity index at province-by-day level is collected and calculated by the Pandemic and Borders project. The diversity index is the weighted sum of pair-wise genomic distance between clusters of SARS-CoV-2 variants. It is informative for detecting the potential importation of new variants into geographic areas. We use sharp jumps in the diversity index to proxy for the arrival of new variants. When used as an outcome variable, these jumps allow us to analyze whether ITMs limited the importation of new COVID-19 variants into the country.

Data on the number of travelers entering Canada is from Statistics Canada, which contains information on the daily number of travelers entering Canada by traveler's country of resident. For control variables, we use country-by-day data on the number of covid cases and deaths from Our World in Data. Finally, we use Oxford's COVID-19 Government Response Tracker which contains a stringency index of non-pharmaceutical interventions during the pandemic. We isolate the components of this index which are not related to international travel, thereby capturing the non-ITM policy environment.

The basic idea of our empirical method is to compare the number of entries into Canada before and after the implementation of each ITM. However, there are several challenges in this analysis. First, Canada adopted a large number of ITMs during the pandemic, which varied in policy type, targeted country, and targeted subpopulation. Moreover, multiple policies are typically adopted in quick succession, making it impossible to isolate the effect of individual ITMs.

Instead of studying the effect of specific ITMs, we study the effect of "important policy windows". To be specific, instead of comparing the outcome variables before and after each individual ITM, we compare outcomes before and after a 5-day or 7-day window, during which a group of important ITMs were implemented.

We use a qualitative method to identify these important policy windows. First, we set up three baseline standards for the important policy windows: enforceability, intensity, and isolation. Enforceability meaning the ITMs should be mandatory and enforceable. Intensity is defined by the quantity/density of ITMs during a relatively short time period. Finally, isolation means a policy window needs to be "isolated" for us to identify its effects: there should not be any other policy windows within a 14-days window before or after it.

Using these three baseline rules to examine the 144 ITMs during COVID-19 pandemic by the Canadian government, we identified eight important policy windows: 1) 2020 Mar 16 – Mar 18: all foreign nationals except those from the US will be denied entry to Canada. 2) 2020 May 12: closure of small entry points. 3) 2021 Jan 6 – Jan 7: test requirement for all air travellers. 4) 2021 Dec 18 – Dec 2: end the individual-based restrictions for travellers from targeted African countries, while enhancing testing requirements for all travellers. 5) 2022 Feb 28: decrease and end of intensive border restrictions. 6) 2022 Oct 1: removal of all travel restrictions. 7) 2023 Jan 5: test requirements for travellers arriving from China. 8) 2023 Mar 17: the end of any federal COVID-19 border measures.

The second difficulty is the potential endogeneity problem. The timing of Canada's travel restrictions reflect, in part, the severity of COVID-19 in targeted countries and, more broadly, the world. At the same time, an individuals' decision to travel abroad is likely to be influenced by the prevalence of the disease both in their home country and potential destination. In other words, when an increase in COVID-19 cases is observed, we would likely see a reduction in travelling even without any ITMs. Furthermore, other NPIs, such as social distancing and business closure, could also affect people's

willingness to travel and may be correlated with ITMs. Therefore, simply comparing the number of travelers before and after each policy window may yield a biased estimated of the impact of ITMs on travel volumes.

We use time-series regressions and event studies to empirically study the impacts of international travel measures. To isolate the effect of ITMs from concurrent events, we control for the 14-day lagged COVID-19 cases and deaths in both the targeted country and receiving country, as well as the stringency of domestic NPIs.

Next, we apply the same empirical methods, with the diversity index as our outcome variable. However, the level change in diversity index only shows part of the picture. The speed of changing, for example, a sudden drastic jump in diversity index, may be a better “flag” for the importation of a new variant. Therefore, we define “jumps” in diversity index, if the change in diversity index of day t is larger than two standard deviations of the changes within a 7-day window. We then calculate the possibility of observing a jump within 14 days after the important policy window for each province.

Results

Using inbound travel volume as the outcome, we find that first, some of Canadian’s most intense ITMs, such as border restrictions started in March 2020, turns out not to be the most “costly” ITM, especially after controlling for covid info and domestic NPIs. It suggests that during the time when the number of cases increased drastically, people’s willingness to travel have been largely reduced by the threat of the pandemic itself and other NPIs. Imposing strict border restrictions did not impose much extra economic costs.

Second, the mass testing requirement at the border significantly reduced the number of entries. For example, the ITM with the largest impact is end the individual-based restrictions for travellers from targeted African countries, while enhancing testing requirements for all travellers.

Third, after controlling for Covid-19 cases and deaths, the effect sizes of the ITMs are largely reduced. This is consistent with findings from existing literature that voluntary reduction in travelling plays an important role.

As for the effectiveness of ITMs, we find that the travel restrictions did not affect the diversity index significantly. However, during the end of 2022 and early 2023, as Canada largely relaxed its travel restrictions, we observe some large jumps in diversity index, suggesting that new variants came in with the relaxed international travel restrictions.

Second, we find that the effects of the same policy window vary across provinces in Canada. First, after a same important policy window, jumps in diversity index are only observed in some provinces, while other provinces report zero jump. For example, after window 1 (border closure except for US travellers in March 2020), a negative jump in diversity index was only observed in Ontario. Second, the timing of observed jumps also vary across provinces. For example, after window 5 (relaxation of travel restrictions), Alberta is the first province to have a positive jump in diversity index, followed by British Columbia and then Ontario. The mechanisms underlying such heterogeneity effects remain an interesting topic for future study.

Discussion

This study presents empirical evidence on the economic and social impacts of COVID-19 ITMs and their effectiveness in preventing the importation of new variants. We found that since people respond to the COVID-19 information, and make voluntary changes to their travel plans, the most strict ITM, border closure, has imposed a smaller impact on travel volume than other softer

measures, such as mass testing requirements. We also find that the effectiveness of ITMs vary largely across different provinces in Canada.

Due to the data availability, this study only looked at the cost-effectiveness of ITMs in the short-term. Existing evidence suggests ITMs also have potentially long-term economic and social impacts. For example, the reduction in number of cross-border workers and international students, may force the related industries to switch online and towards local residents, which could change the market in the long-term. This could be an interesting topic for future study.

TITLE: Associations between prenatal exposure to phenols and child neurodevelopment at two years of age in a South African birth cohort

ABSTRACT:

Evidence suggests that prenatal phenol exposures negatively impact child neurodevelopment, however there is little research on the effects of mixtures of multiple phenol exposures. We aim to analyze associations between prenatal phenol exposure mixtures and cognitive neurodevelopment at age two among 653 children from the South African Drakenstein Child Health Study. We measured maternal urine phenol concentrations (BP1, BP3, BPA, BPS, ETPB, MEPB, PCP, PRPB, TCS) in the second trimester of pregnancy. We used the Bayley Scales of Infant and Toddler Development III to assess cognitive development at age two. We used linear regression models adjusted for maternal HIV status, maternal age, ethnicity, maternal smoking, child sex, and socioeconomic status (SES) to explore individual exposure effects. We used the mixture methods of self-organizing maps (SOM), Bayesian kernel machine regression (BKMR), and weighted quantile sum (WQS) regression to explore joint effects of the exposure mixture. We conducted effect modification analyses for SES, sex, smoking, and ethnicity. We found no association between individual phenol exposures or the joint exposure mixture and cognitive score. SES and smoking were effect modifiers of the association between BPS exposure and cognitive development (interaction p-values 0.007 and 0.047, respectively). Higher BPS concentrations were associated with lower cognitive scores among participants of the highest SES quartile (beta=-1.838; 95% CI: -3.472, -0.205) and among non-smokers (beta=-1.827; 95% CI: -3.717, 0.064). Sex was an effect modifier of the association between BPA exposure and cognitive scores (interaction p-value=0.021), with males having a significant adverse association (beta=-1.40; 95% CI: -2.548, -0.251). In conclusion, while we did not find significant associations between prenatal phenol exposure and cognitive development in the whole sample, the association with BPS and BPA might be more pronounced among certain subgroups.

TITLE: Association of genome-wide significant ovarian cancer susceptibility loci with abnormal ovarian ultrasound findings in the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial

ABSTRACT:

Objective: Transvaginal ultrasound (TVU) has been evaluated for early detection of ovarian cancer but suffers from unspecific findings and limited lead time before clinical diagnosis. Performance of TVU for ovarian cancer detection may vary in populations at different risk of ovarian cancer, including those with genetic susceptibility. This study sought to investigate the association of established ovarian cancer susceptibility loci with abnormal TVU screening results to inform new approaches towards risk stratification for ovarian cancer screening.

Methods: We assessed the association between 28 single nucleotide polymorphisms (SNP) and TVU screening results in female Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial participants. Ultrasound screening results and complete genotyping information were available for 23,550 European females, including 23,389 subjects without ovarian cancer and 161 ovarian cancer cases. Odds ratios were calculated to assess SNP associations with abnormal TVU screening results, defined as ovarian volume or cyst volume > 10 cm³ and/or any solid/cystic component within a cystic ovarian tumor.

Results: Three loci showed increased risk of abnormal TVU results at PLCO baseline screen, with odds ratios of 1.18 (95% CI: 1.03-1.37; P= 0.021) for rs13113999 on chr. 4, 1.18 (95% CI: 1.04-1.33; P= 0.011) for rs10069690 on chr. 5, and 1.19 (95% CI: 1.05-1.34; P= 0.006) for rs7705526 on chr. 5. The odds ratio of combined effects for any of the three loci was 1.45 (95% CI: 1.16-1.84; P= 0.001). Associations were similar for all subjects and when restricting to individuals without cancer.

Conclusions: Three ovarian cancer susceptibility loci on chromosomes four and five were found to be associated with abnormal TVU results. A previous association between a locus on 9p22 and abnormal TVU was not confirmed in this larger study. Our findings support further evaluation of genetic susceptibility and ovarian cancer screening performance.

TITLE: Health status or education levels in adulthood as proxy measures for unavailable childhood health status or parental education in survey data

ABSTRACT:

Introduction: Epidemiological studies with life-course trajectories may require adjusting for relevant confounders within the timeframe to improve the validity. Studies involving child health and future health in adulthood, are required to control for demographic characteristics in both time frames. However, this is not quite feasible for many survey datasets due to the long interval time to recall for childhood variables. Therefore, this study aims to evaluate whether health status or education levels in adulthood can be used as proxy measures for unavailable childhood health status or parental education levels in survey data.

Methods: This is a study using two large survey data from two countries: The United Arab Emirates Healthy Future Study (UAEHFS) and the Indonesia Family Life Survey Fifth Wave (IFLS-5). We included 5705 from the UAEHFS and 31,397 individuals from the IFLS-5 with complete responses of child/adult health status (poor/fair vs. excellent/good) as well as parental education vs. own education during adulthood. Non-parametric Spearman's rho correlations were used to examine correlations of health status or education levels in childhood and adulthood, respectively.

Results: Health status during childhood was statistically correlated with health status during adulthood 15% using UAEHFS, and 4% using IFLS-5. On the other hand, parental education was statistically correlated with adult education levels by 31% using IFLS-5. There was no statistically significant correlation observed between parental and adult education levels using UAEHFS due to a significant amount of uncertain responses (prefer not to answer and do not know).

Conclusions: Health status or education levels in adulthood may be used as a proxy measure for health status in childhood or parental education, respectively. Using available adult characteristics as proxies for child characteristics in survey data may be feasible to address the unavailability of important childhood characteristics as control variables.

Table 1: Spearman’s rho correlation of health status during childhood with adulthood, as well as parental education levels with education levels in adulthood, using two survey data.

United Arab Emirates Healthy Future Study (UAEHFS), n=5705		Correlation Coefficients		
	Health status in adulthood [95% CI]	p-value	Education levels in adulthood [95% CI]	p-value
Health status during childhood	0.15 [0.113-0.180]	<0.001		
Parental education levels			0.04 [0.026-0.044]	<0.001

Indonesian Family Life Survey Fifth Wave (IFLS-5), n=31,397		Correlation Coefficients		
	Health status in adulthood [95% CI]	p-value	Education levels in adulthood [95% CI]	p-value
Health status during childhood	-0.04 [-0.091-0.179]	<0.001		
Parental education levels			0.31 [0.289-0.324]	<0.001

TITLE: Examining Socioeconomic Disparities and Diabetes: Findings from 2007-2020 National Health and Nutrition Examination Survey

ABSTRACT:

PURPOSE: Diabetes is one of the most widespread metabolic diseases, highlighting disparities in its prevalence. However, limited research has investigated the associations between socioeconomic disparities and diabetes. Our objectives were twofold: 1) to investigate the associations between socioeconomic status (SES) and diabetes, and 2) to examine whether age, sex, and physical activity (PA) moderate this association.

METHODS: Data came from the 2007-2020 National Health and Nutrition Examination Survey (NHANES), a series of cross-sectional cohort studies (N=30,775, Female=51.1%, mean age=47.4). Diabetes status was based on yes/no. The SES exposure included family poverty income ratio (PIR; low, middle, vs high-income [referent]). Accounting for the complex survey design, weighted generalized Poisson models were employed to examine the relationship between PIR and diabetes. The analyses were moderated by age groups (20-44, 45-64, 65-79), sex (male/female), and meeting PA guidelines (yes/no), adjusted for race/ethnicity, education, BMI, and survey years.

RESULTS: Low- and middle-income families, compared to high-income ones, had a 35% and 21% higher likelihood of diabetes, respectively. In the 45-64 age group, low- and middle-income families had 56% and 32% higher likelihood of diabetes, respectively. In the 65-79 age group, low- and middle-income families had 24% and 20% greater risk of diabetes, respectively. Yet, no significant association was observed in the 20-44 age group. Males from low-income families had a 20% higher likelihood of diabetes than their high-income counterparts, but no significant association was observed in males from middle-income families. Females with low- and middle-income families had a 48% and 29% higher likelihood of diabetes, respectively. Among adults not meeting PA guidelines, low- and middle-income families showed 42% and 27% higher likelihood of diabetes, respectively. Among adults meeting PA guidelines, low-income families had a 21% higher likelihood of diabetes, but not middle-income families.

CONCLUSION: This study, through the intersectionality between SES, demographics, and PA, indicated that low-income families have the highest risk of diabetes, followed by middle-income families. This income-related diabetes risk is more pronounced in adults aged 45-64, women, and those not adhering to PA guidelines. Effective interventions should prioritize local efforts to invest in lower-income areas to reduce disparities in diabetes.

TITLE: Insights into the spatial epidemiology of Hepatitis C infection: Systematic synthesis of Area-Level Determinants and Spatiotemporal Analyses

ABSTRACT:

Background: Hepatitis C virus (HCV) stands at the forefront of global elimination endeavors by 2030, demanding a nuanced exploration of disparities and vulnerabilities through an innovative spatial epidemiological lens. This systematic review delves into area-level factors shaping HCV risk, highlighting the pivotal role of spatial analyses in advancing our understanding of the dynamic interplay driving HCV infection.

Methods: A systematic search spanning 2000 to 2023 was conducted via PubMed, Web of Science, Scopus, and Embase. Selection criteria yielded 65 studies, primarily cross-sectional (93.8%), concentrated notably in the WHO Americas region (47.7%).

Results: 60% of studies focused on the general population, with 20% targeting people who inject drugs. Primary outcomes explored in the studies included prevalence (46.2%) and incidence (33.8%) of HCV infection. Moreover, 40.0% of the studies employed various spatial data exploration and cluster analysis methods to explore nuanced patterns of the infection. 16 studies applied spatial or spatiotemporal models, shedding light on the intricate relationships between area-level factors and HCV outcomes. The area-level factors explored predominantly were characteristics of the social and economic risk environments. Overall, areas with a higher level of socioeconomic disadvantage, lower education attainment, more minority ethnic populations, higher population density, and located more remotely were associated with higher HCV infection rates. Further, area-level accessibility to harm reduction and healthcare services significantly influenced HCV infection, detection, and treatment rates.

Discussion: This review emphasizes the imperative of adopting a spatial epidemiological lens to decipher the complex interplay of area-level determinants in HCV infection dynamics. Limited spatial model application highlights untapped potential, emphasizing the need for enhanced spatial techniques to pinpoint vulnerable areas. Such methodologies offer promise in guiding resource allocation and crafting tailored population-level HCV elimination strategies. Embracing place-based approaches becomes paramount for navigating the intricate landscape of factors essential for effective HCV infection prevention, serving as a guide for realizing the global HCV elimination targets by 2030.

TITLE: Examination of the utility of thermal imaging in trauma resuscitations

ABSTRACT:

Background: Approximately 30% of level 1 and level 2 trauma centers in the United States recently reported using video technology in resuscitation reviews. Currently there is limited research on the use of infrared thermal imaging in conjunction with the use of videos. Study objective: to examine the potential value of a thermal camera system in trauma resuscitation bays.

Methods: A retrospective 10-week review was conducted at a Midwestern level I trauma center with thermal video cameras in two trauma bays. Eligible cases included level I and II trauma activations. Patterns associated with injuries, physiological states, or resuscitative interventions/scenarios were identified through an initial medical student review and secondary Trauma Medical Director review of thermal imaging videos.

Results: During the study period, 135 pediatric/adult trauma resuscitations were documented, 50% were level I activations. Thirty of the patients had non-useable thermal videos due to an obstructed view (n=22), not recorded (n=4), or other factors (n=4). Of the remaining 105 videos, 25 patients had patterns of interest: temperature control (n=8); tourniquets (n=5); shock (n=5); soft tissue injury (n=3); and others (n=4). Primary mechanisms of injury were motor vehicle collisions (n=81) and falls (n=19); with 20 patient mortalities.

In temperature control videos, blankets and transport ventilators showed limited effectiveness on thermal imaging, while high flow nasal cannula and infusion pumps appeared more effective for patient rewarming. Effective tourniquet placement was confirmed in 1 out of 5 cases and shock documented in 10 patients with 5 having “blotchy” images. Soft tissue injury cases exhibited cooler areas and lastly, a hemorrhage was noted after a chest tube placement. See Figure for examples of thermal images.

Conclusion: Thermal imaging in the trauma room appears to have a potential for enhancing quality improvement reviews and may be a valuable tool for trauma surgeons.

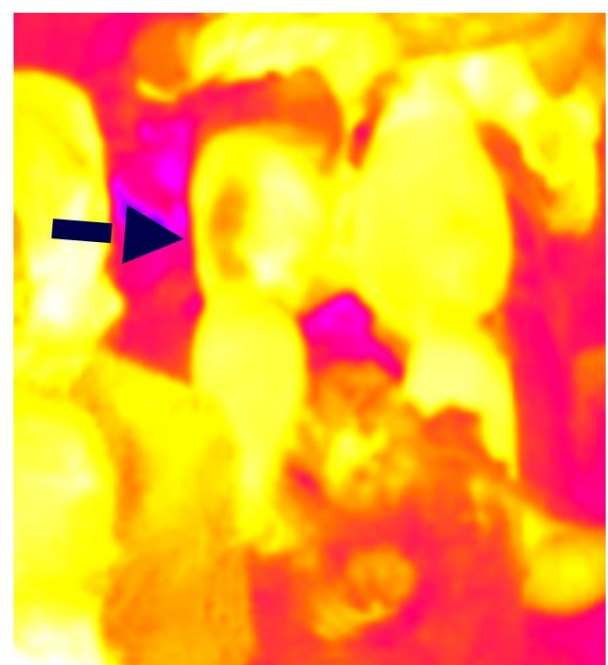
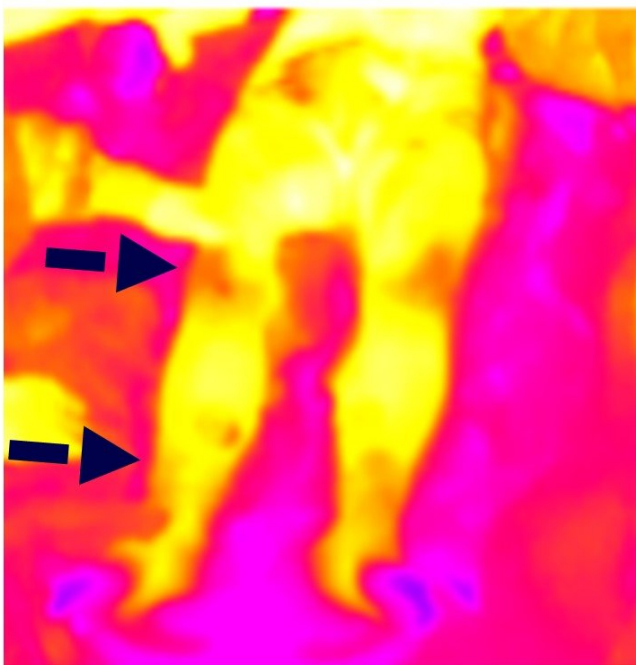
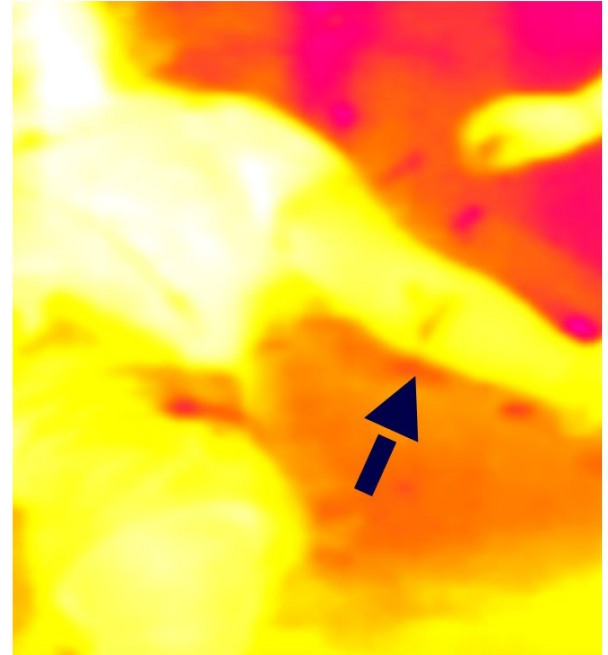
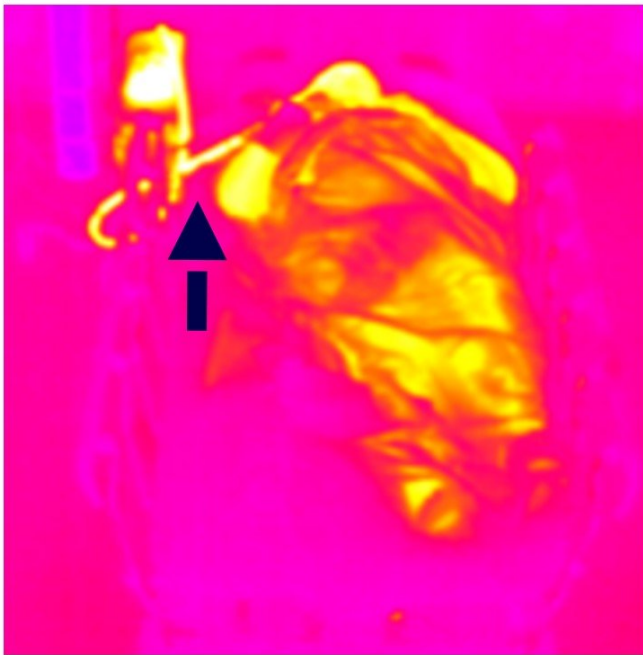


Figure. Top left: infrared thermal image depicting patient in trauma bay receiving oxygen therapy through a high flow nasal cannula. Top right: patient with an ineffective tourniquet on left arm. Bottom left: patient in shock with lower abdomen and extremities displaying blotchy patterns. Bottom right: patient with a soft tissue injury revealing thermal color difference.

TITLE: Rising temperatures, falling counts: An investigation of ambient heat and semen quality

ABSTRACT:

Introduction: Over the past several decades, population-level exposure to extreme heat has increased while sperm quality has decreased. Despite this ecologic correlation, there have been few epidemiologic investigations of the effects of extreme heat on sperm quality.

Methods: We estimated the effect of ambient temperature on semen quality using data from 690 men (1,247 samples) participating in Pregnancy Study Online (PRESTO), a web-based preconception cohort study. Eligible female participants were aged 21-45 years, residents of the U.S. or Canada, and trying to conceive without fertility treatments. Male partners aged ≥ 21 years were invited to participate in an at-home semen testing substudy where they collected up to two semen samples and measured semen volume, sperm concentration, total sperm count, motility, and total motile sperm count (TMSC). We linked residential address data to county-level estimates of ambient temperature. Specifically, we calculated the average of maximum daily temperature during the 72-day window prior to semen collection, corresponding with the window of spermatogenesis. We used linear regression to estimate mean % differences (%D) in semen characteristics and log-binomial regression to estimate RRs for low semen quality, defined using WHO reference standards, adjusting for age and abstinence time.

Results: Higher ambient temperatures were associated with lower semen quality, particularly measures of sperm motility. For example, a 10-degree increase in average maximum temperature was associated with %D in TMSC of -8.0 (95% CI: -15.7, 0.4) and 1.36 times the risk of low TMSC (95% CI: 1.10, 1.69). Associations were slightly stronger when we restricted to semen samples collected during the warm season (%D=-13.6 [95% CI: -27.6, 3.0], RR=1.63 [95% CI: 1.12, 2.36]).

Conclusion: Higher ambient temperatures during spermatogenesis were associated with poorer semen quality, particularly measures of sperm motility.

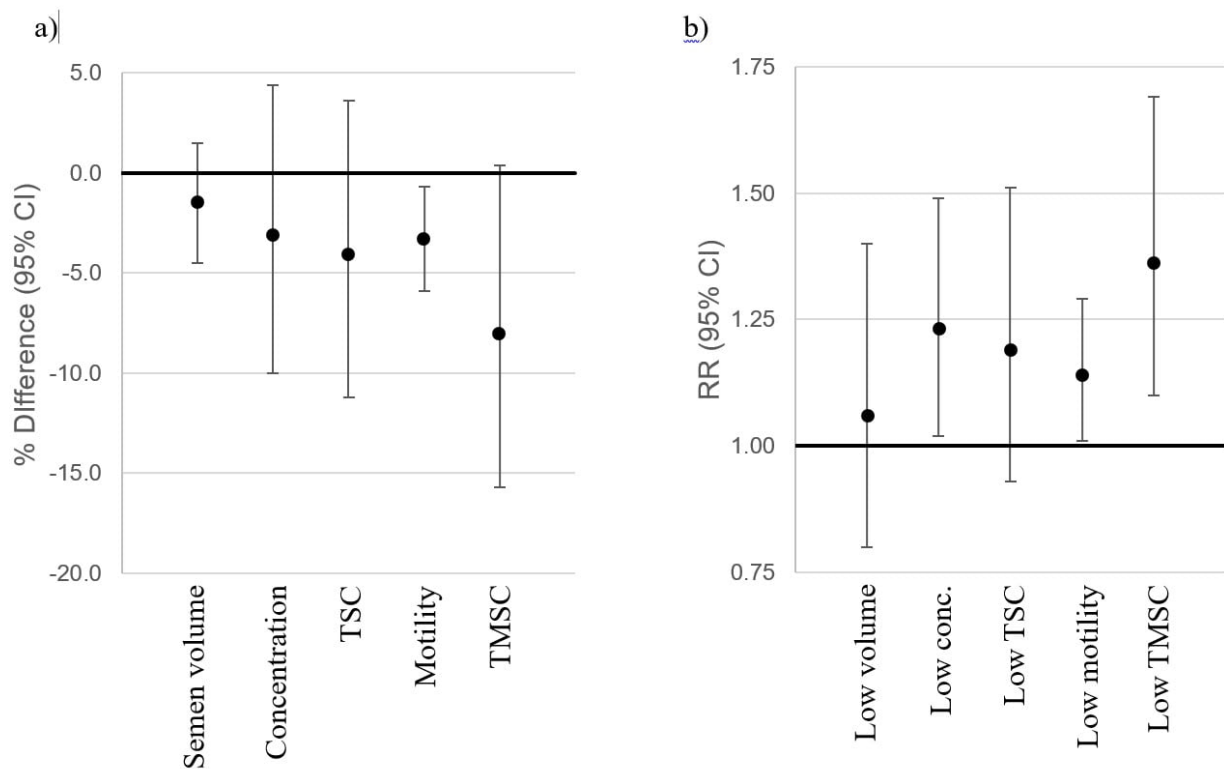


Figure. Association of a 10-degree increase in ambient temperature with a) % difference in semen parameters and b) risk ratio of low semen quality, Pregnancy Study Online, 2013-2022. Estimates are adjusted for age and abstinence time. TSC = total sperm count; TMSC = total motile sperm count.

TITLE: Association of sugary drinks, carbonated beverages, vegetable and fruit juices, sweetened and black coffee, and green tea with subsequent depression: a five-year cohort study

ABSTRACT:

Background & aims: Evidence on the impact of beverage consumption on depression is limited in the Asian population. Specifically, there is little information available on vegetable and fruit juices, while whole vegetables and fruits are reportedly protective against depression. Furthermore, evidence is scarce in differentiating the impacts of sweetened and black coffee. We aimed to examine the association of the consumption of total sugary drinks, carbonated beverages, vegetable and fruit juices, sweetened and black coffee, and green tea with subsequent depression in a general population sample.

Methods: We studied individuals without depression at baseline in 2011–2016, with a five-year follow-up. We evaluated the association of total sugary drinks, carbonated beverages, vegetable juice, 100% fruit juice, sweetened coffee, black coffee, and green tea with subsequent depression. Missing data were handled using random forest imputation. We also explored effect heterogeneity across sex.

Results: In total, 112,206 individuals were evaluated, with 8,663 showing depression at five years. When comparing the high consumption group with the no consumption group, the fully adjusted risk difference (RD) (95% CI) was 3.3% (2.6% to 4.0%) for total sugary drinks, 3.1% (2.0% to 4.3%) for carbonated beverages, 1.2% (0.2% to 2.2%) for vegetable juice, 2.9% (1.8% to 4.0%) for 100% fruit juice, and 2.4% (1.6% to 3.2%) for sweetened coffee. In contrast, the fully adjusted RD (95% CI) was -2.5% (-3.3% to -1.7%) for black coffee and -1.1% (-2.0% to -0.1%) for green tea. The results were robust in multiple sensitivity analyses. Evidence was weak for effect heterogeneity across sex.

Conclusions: Total sugary drinks, carbonated beverages, vegetable and fruit juices, and sweetened coffee may increase the risk of depression, whereas black coffee and green tea may decrease it.

TITLE: Impact of neighborhood social cohesion and rodent sightings on mental health among residents of New York City

ABSTRACT:

Common mental disorders such as depression and anxiety are highly prevalent globally, and rates have been especially high in New York City (NYC) since the COVID-19 pandemic. Neighborhood social and physical environments have been found to influence mental health. Using 2020 NYC Community Health Survey data from 8,781 NYC residents, we investigated the impact of neighborhood social cohesion and neighborhood rodent sightings (as an indicator of poor neighborhood cleanliness) on nonspecific serious psychological distress (NSPD) status, measured using the Kessler Psychological Distress Scale. Multivariable logistic regression was used to evaluate the relationships among social cohesion, rodent sightings, and NSPD, adjusted for confounders and complex sampling and weighted to the NYC population. Effect measure modification (EMM) of rodent sightings on the effect of social cohesion on NSPD was evaluated on the multiplicative scale by adding an interaction term to the logistic regression model and stratifying on the modifier if significant and on the additive scale using the Relative Excess Risk due to Interaction (RERI). Social cohesion was found to decrease the odds of NSPD (OR: 0.73, 95%CI: 0.55, 0.97) and sighting of rodents was found to increase the odds of NSPD (OR: 1.66, 95%CI: 1.25, 2.20). EMM was significant on the multiplicative scale. In the stratified models, there was a protective effect of social cohesion against NSPD among those not reporting rodent sightings (OR: 0.57, 95%CI: 0.39, 0.82), but there was no effect among those reporting rodent sightings (OR: 0.99, 95%CI: 0.65, 1.51). Our findings suggest that both neighborhood social cohesion and rodent sightings impact the mental health of New Yorkers and that the negative impact of rodent infestations may diminish the benefit of neighborhood social cohesion.

TITLE: Navigating Faith and Mental Health: A Geo-Spatial Investigation into Depression and Religious Context

ABSTRACT:

Navigating Faith and Mental Health: A Geo-Spatial Investigation into Depression and Religious Context

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Brigham Young University, Department of Public Health

Intro

Our project aimed to determine if religiosity is a variable that significantly affects the quality of mental health among residents in Utah counties.

Methods

We retrieved data on poverty, places of worship, and bachelor's degree attainment from County Health Rankings, Utah GIS, and Utah IBIS respectively. We conducted an exploratory linear regression according to the following model: rate of poor mental health days = intercept + B1 (poverty rate) + B2 (religiosity) + B3 (completion of a bachelor's degree or higher). The regression analyses were run in GeoDa, including the incorporation of a spatial lag.

Results

We found that the number of places of worship was associated with mental health outcomes (beta=0.265796, p-value= 0.04996). However, poverty is a greater indicator of mental health outcomes than religiosity (beta = 5.02983, p-value < 0.0000). Our regression, with the spatial weight included, had an R-squared value of 0.903. The coefficient paired with lag coefficient is negative, which indicates that there are more spatial factors contributing to the dependent variable that were not included in our study.

Conclusion

We conclude that while the availability of religious communities as a number of buildings does play a role in mental health outcomes, poverty ultimately has a more significant influence on the rate of poor mental health days.

TITLE: The effects of virtual Reality intervention on stress management among college students

ABSTRACT:

Background: In recent years, more attention has been given to virtual Reality (VR) as an innovative intervention tool in public health. The purpose of this study was to assess whether VR intervention is more effective in managing stress than audio meditation among college students.

Methods: This study used experimental pretest-posttest design. 20 students were randomly assigned to either the experimental group (VR meditation) or the control group (Audio meditation).

Participants completed four meditation sessions per week. In each session, participants engaged in 15-20 minutes meditation. Participants completed baseline survey before the first meditation and follow-up survey after the fourth meditation session. Surveys assessed demographic characteristics, the Perceived Stress Scale (PSS-10), the Warwick-Edinburg Mental Well-Being scale (WEMWBS), and the Self-Compassion Scale-Short Form (SCS-SF).

Results: A total of 13 students (VR=7, audio=6) completed the four-week meditation sessions. The mean age was 21 years, PSS-10 was 20.84 (audio=22.33, VR=19.57), WEMWBS was 43.84 (audio=41, VR=46.28), and SCS-SF was 41.15 (40.66=audio, 41.57=VR) at baseline. There was no significant difference in PSS-10 and SCS-SF within the groups before and after the intervention. However, there was a significant difference in mental well-being among the VR group before and after the intervention (from 46.28 to 50, $p=.0227$). Additionally, all individuals in the VR group reported that they did not feel any discomfort during the meditation sessions, while 33% of the audio group reported discomfort during the meditation sessions.

Conclusions: VR meditation intervention promoted psychological well-being in the short-term. This study suggests the potential of VR intervention as a valuable tool for increasing well-being of college students.

TITLE: Awareness of alternative data generating processes when exploring model identifiability

ABSTRACT:

Background: The scope of possible variable relationships within a dataset is likely larger than most individuals imagine. As the number of variables increases, the number of relationship possibilities increases super exponentially. This abstract aims to: construct a formula for calculating the number of directed graphs (DGs) for a set of variables and provide a visual example of possible relationships for a trivial set of variables.

Methods: Two random variables (e.g., X and Y) can be dependent or independent. In a DG there can be an arrow from X to Y, vice versa, or an absence of an arrow; representing three possible relationships. A formula was constructed for calculating the total number of DGs that could exist for a set of variables. Next, DG visualizations were created for a small dataset to demonstrate the large number of alternative structures and difficulties in model identification.

Results: The number of DGs including cycles for a k-variable set is: $3^{(\text{sum: } 1 + 2, \dots, + (k-1))}$. So, a 2-variable set has three and a 5-variable set has 59,049 possible DGs (29,281 acyclic graphs). The Figure displays graphs for the 3-variable set. Of these graphs, 10/27 have a causal path from X to Y and when controlling for the third variable (i.e., W), 5/10 will correctly estimate total X $\rightarrow$ Y association via traditional regression. Thus, when receiving a 3-variable set from a colleague assuming an X $\rightarrow$ Y relationship, 10 possible underlying DGs would represent the relationship and if a saturated model (Y | X, W) was used, 50% of models would output an unbiased estimate.

Conclusions: Presented was a trivial example showing possible relationships that could exist in a dataset. An ability to generate all possible graphs for the set can help understand identifiability, minimum sufficient adjustment sets, and determine biases. Not mention were variable interactions and potential estimate issues when indiscriminately fitting regularizing, tree, or neural network models to data.

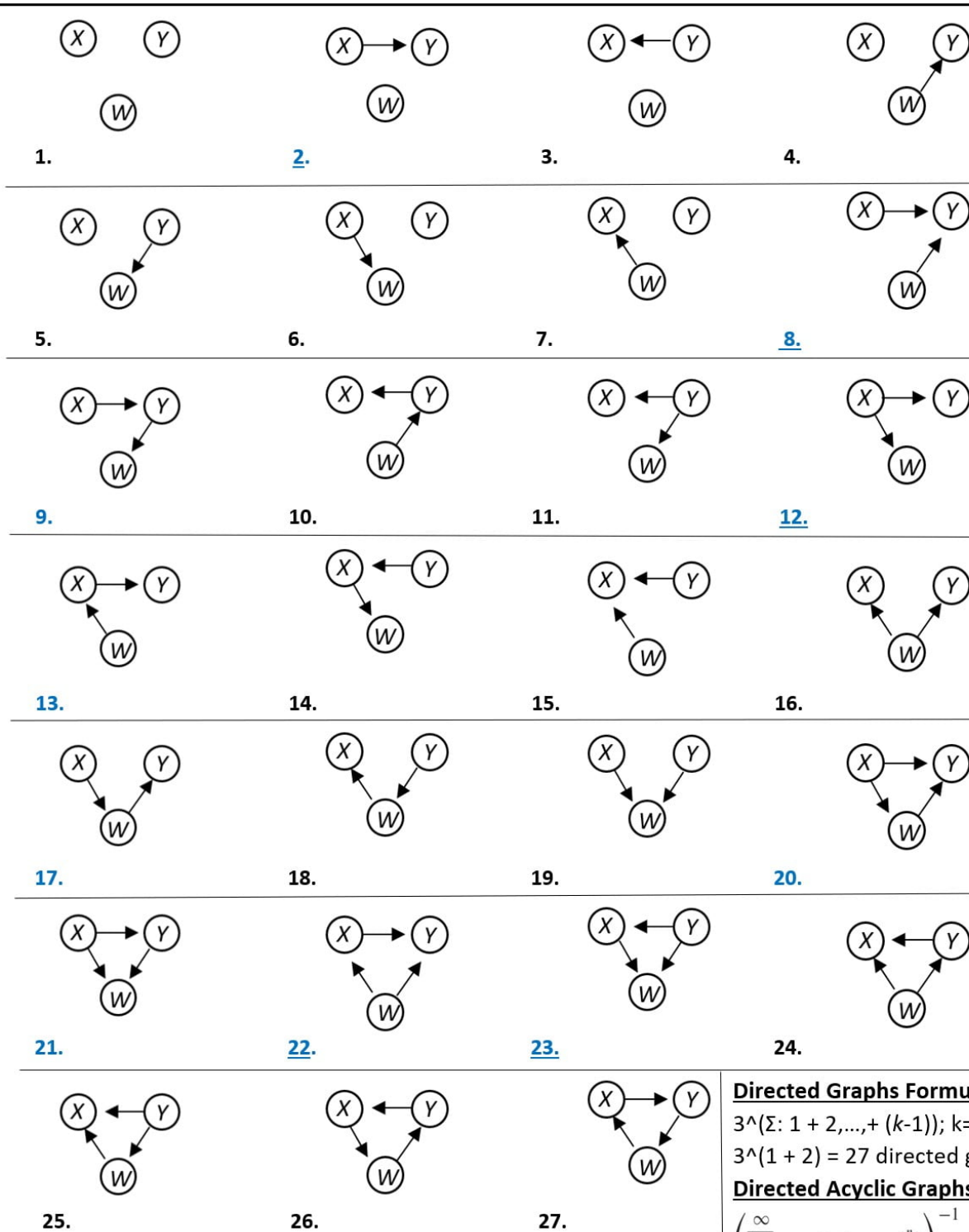


Figure: All possible directed graphs for a 3-variable set (including cycles: 26, 27). Graphs representing a causal relationship between X and Y: **2, 8, 9, 12, 13, 17, 20, 21, 22, 27** - with graphs **2, 8, 12, 13, 22** outputting unbiased total estimates when controlling for W in a saturated regression model. Also presented is the directed acyclic formula by Stanley RP (1973).¹ Thus, a 9-variable data set could have 121,344,245,842,881 DAGs or 150,094,635,296,999,136 directed graphs.

Directed Graphs Formula:
 $3^{(\sum: 1 + 2, \dots, + (k-1))}; k=3$
 $3^{(1 + 2)} = 27$ directed graphs

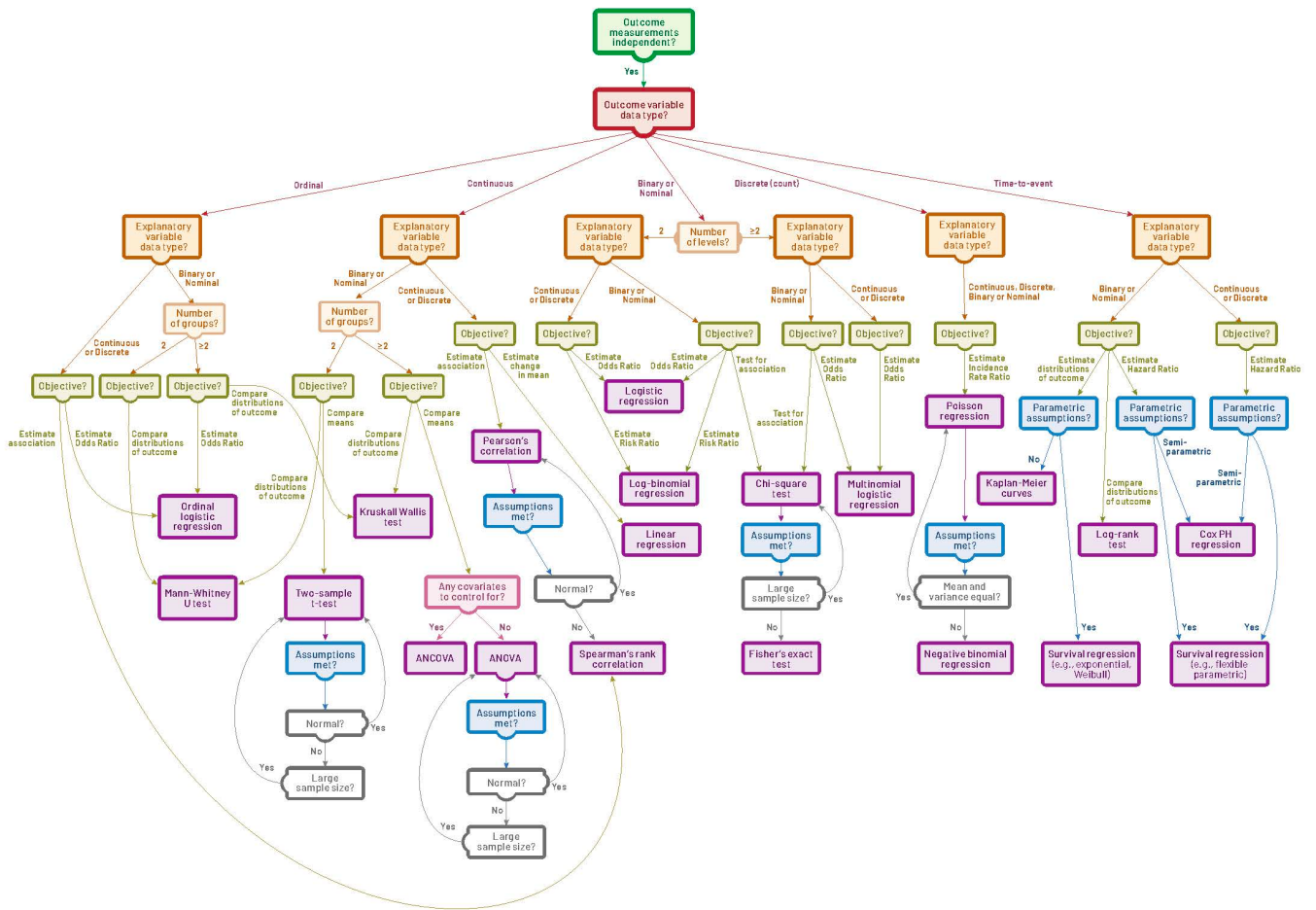
Directed Acyclic Graphs (DAGs)¹:

$$\left(\sum_{n=0}^{\infty} (-1)^n x^n / n! 2^{\binom{n}{2}} \right)^{-1} = 25 \text{ DAGs}$$

TITLE: Critical appraisal of a statistical analysis: a novel visual guide

ABSTRACT:

Critical appraisal is a fundamental process in evidence-based medicine, serving as a bridge between research findings and clinical practice. Critical appraisal assesses the validity of the data and completeness of reporting, methods and procedures, and conclusions. While several critical appraisal tools have been developed, they do not focus on statistical validity and existing guides to introduce non-experts to assessing the value of medical literature do not include statistical methods for an array of data types, and for both correlated data and non-parametric approaches. There is therefore little guidance for reviewers to decide if the statistical analyses were appropriate. Without advanced training, it is difficult to critically appraise statistical analyses. Lastly, reporting guidelines, such as CONSORT and STROBE, suggest reporting descriptions of outcomes, interventions and statistical methods in a checklist form, but without further guidance, it may be difficult to know if appropriate methods were used. We therefore aim to help researchers to determine the appropriateness of the statistical analyses in both formal settings (e.g., peer review) and informal settings (e.g., journal club) for observational and experimental studies. We describe key items to consider, where to find information on these items, and how to assess the item. We graphically present the relation between some common statistical methods and these key items, namely the independence of the observations, outcome and explanatory variable data types, assumptions, and ensuing results (FIGURE).



TITLE: A Proof Of Concept: Developing and Evaluating Three Methods of Proxy Development for Flourishing in A Longitudinal Cohort

ABSTRACT:

Longitudinal cohort studies offer crucial insights into health trends, using standardized scales across data collection waves. The challenge arises as health research evolves, requiring new scales for novel constructs and effective use of historical data. This project defined flourishing across six domains—happiness, life satisfaction, mental and physical health, meaning and purpose, character and virtue, and close social relationships. Leveraging data from the All Our Families (AOF) cohort, the study aimed to create a specific flourishing proxy score, utilizing the Secure Flourishing Index (SFI) as the gold standard. Three approaches were employed. The external conceptual model mapped AOF data onto the flourishing score using variable selection. A predictive multi-variable linear regression was constructed to predict individual flourishing based on SFI domains. The flourishing proxy score, chosen via regression modeling and validated against the SFI, was assessed using AIC. Sensitivity analysis created maximum and minimum flourishing models. The second model employed similar principles. A Structural Equation Model (SEM) was constructed to more readily map the latent effects (flourishing domains) not directly captured in surveys. The data-driven model, the third approach, used LASSO to derive a model encompassing relevant dataset items. All models were assessed via various indicators such as goodness of fit, ROC, and predictive values. All model estimates will be expressed as beta coefficients with 95% confidence intervals and p-values, with statistical significance set at an alpha value of 5%. The study aimed to create a robust and versatile proxy score for AOF flourishing, emphasizing the importance of validation before future applications.

TITLE: Forecasting the 20-year Incidence of Dementia by Socioeconomic Status, Race/Ethnicity, and Region Based on Mid-Life Risk Factors in a U.S. Nationally Representative Sample

ABSTRACT:

Background: Alzheimer's disease and related dementias (ADRD) incidence varies based on demographics, but mid-life risk factor contribution to this variability requires more research.

Objective: The purpose of this study is to examine the extent to which risk factor differences 20 years ago may explain current socioeconomic status (SES), race/ethnicity or regional disparities in dementia incidence using an existing prediction model in a nationally representative sample of U.S. older adults.

Methods: We applied the Cardiovascular Risk Factors, Aging, and Incidence of Dementia (CAIDE) prediction model to the 2006 wave of the Health and Retirement Study (HRS) in participants aged 45 to 64 to estimate the 20-year risk and number of incident cases; obtaining standard errors and confidence intervals via bootstrap.

Results: The 20-year risk of dementia among middle-aged Americans was 3.3% (95% CI: 3.2%, 3.4%). Dementia incidence was forecast to be 1.51 (95% CI: 1.32, 1.71) and 1.27 (95% CI: 1.14, 1.44) times that in Hispanic and Non-Hispanic Black individuals respectively compared statistically to Non-Hispanic White individuals given mid-life risk factors. There was a progressive increase in dementia risk from the lowest versus highest SES quintile. For geographic region, dementia incidence was forecast to be 1.17 (95% CI: 1.06, 1.30) and 1.27 (95% CI: 1.14, 1.43) times that in Midwestern and Southern individuals respectively compared statistically to Western individuals.

Conclusion: Some disparities in dementia incidence could be explained by differences in mid-life risk factors and may point toward policy interventions designed to lessen the ADRD disease burden through early prevention.

TITLE: Impact of Albendazole Treatment on the Long-Term Symptom Profile of Neurocysticercosis Patients 14-16 years following diagnosis

ABSTRACT:

Background: Neurocysticercosis (NCC) is a neglected parasitic disease that is a major cause of neurological symptoms worldwide.

Methods: We re-contacted 94 participants 12-years after they participated in a 24-month randomized controlled trial evaluating albendazole vs placebo for NCC treatment in Ecuador. We described the symptoms experienced post-trial and estimated the effects of albendazole, and presence of calcified and extraparenchymal NC cysts at the 24-month study imaging on long-term symptoms adjusting for participant sex and age via standardization.

Results: In the 12-years post-trial (14-16 years post diagnosis), 52.1% reported any health problem and 48.9% reported neurological symptoms. Seizures were experienced by 26.6% and 22.3% of participants reported headaches. At 24-month trial imaging, 11 participants had no evidence of NCC cysts, of whom 3 (27.3%) reported having seizures and one (9.1%) reported headaches post-trial. Twenty-four participants had only calcified cysts (residual calcification sometimes left after the parasite dies) at 24-month trial imaging, of whom 8 (33.33%) reported seizures and 9 (37.50%) reported headaches post-trial. We found no significant differences in long-term symptoms by treatment, patient, or cyst characteristics.

Conclusion: Despite a high proportion of participants continuing to experience NCC-symptoms during the 14-16 years after diagnosis, we did not find evidence of a treatment benefit on long-term symptoms. In addition, three participants with complete NCC resolution and nine with only residual calcifications at last trial imaging continued to have seizures after the trial was over, which might be considered unprovoked and an indication of high epilepsy risk. Research is urgently needed to identify new treatments to improve the long-term outcomes for people experiencing this neglected disease.

TITLE: Association between unmet social needs and parental stress in a pediatric asthma clinic

ABSTRACT:

Background

There are well documented associations between unmet social needs and undesirable health outcomes, but little data exist on the association between unmet social needs and stress in families of children with asthma.

Objective

To document the relationship between unmet social needs and parental stress in a Canadian pediatric asthma clinic.

Design/Methods

Ongoing prospective observational study to determine the association between unmet social needs and parental stress was conducted in a tertiary care pediatric asthma clinic, between September 2022 and September 2023. Participants were parents of children with a diagnosis of asthma, treated with at least one controller medication. Unmet social needs were collected by parental self-report using a questionnaire assessing 8 domains: employment, housing, ability to pay for utilities, financial resources, food security, transportation, childcare, and education. The four-item Perceived Stress Scale was used to assess how parents perceived stress and how they felt they were able to manage situations in their lives. Chi-square tests compared our independent variable, the presence vs. absence of unmet social needs, to our dependent variables; each measure of stress (control over important aspects of ones' life, confidence in ability to overcome problems, feeling that everything was going well, ability to overcome too many accumulated difficulties).

Results

Of 162 participants, seventy-seven (48%) reported at least one unmet social need. Compared to participants without unmet social needs, those with unmet needs were more likely to report having no control over important aspect of their work or main activity ($p < 0.001$); less likely to report having confidence in their ability to overcome problems ($p < 0.001$); less likely to report having the feeling that everything was going well ($p < 0.001$); and less likely to report having the ability to overcome too many accumulated difficulties ($p < 0.001$).

Conclusion(s)

Findings suggest significant association between unmet social needs and parental stress of children with asthma. Parental stress and unmet social needs may concomitantly increase the burden of adhering to asthma controller medication, making treatment adherence more challenging through pathways related to the interactions between cognitive burden and precarious living situations. This ongoing Canadian study of children on asthma controller medication seen in a pediatric asthma clinic seeks to elucidate the mechanisms by which these factors make adherence to asthma medication more challenging for families, so that these challenges can be addressed.

TITLE: A latent class analysis of pre-pregnancy multimorbidity patterns in a delivery cohort at a safety-net hospital

ABSTRACT:

Multimorbidity is increasing, affecting approximately 1 in 3 adults and are associated with adverse health outcomes. However, there is a paucity of information describing patterns of multimorbidity among the birthing population. The objective of this study was to describe the clustering of pre-pregnancy chronic condition types in the birthing population with multimorbidity and by age, race/ethnicity, insurance status, and parity using latent class analysis (LCA). We conducted a retrospective cohort study of deliveries using medical record data at a safety-net hospital between 2015 to 2019. Multimorbidity was defined as having at least two diagnoses codes before the start of the index pregnancy. We included chronic conditions based on literature review, obstetric comorbidity indices, and clinical expertise. Final LCA model was selected based on clinical interpretability, class sizes, and statistical fit measures. We also compared the distribution of sociodemographic factors across classes. Of 6,455 deliveries, 1,870 (29%) deliveries were to patients with multimorbidity. LCA resulted in a 3-class model: Class 1 (45% of individuals with multimorbidity) was characterized by mood/anxiety and substance use disorders; Class 2 (39%) was defined by obesity and chronic hypertension; and Class 3 (16%) was characterized by reproductive conditions and infertility. Disparities by sociodemographic factors across classes were observed. Individuals <25 years more frequently in class 1, while individuals aged >35 years were more frequently in classes 2 and 3. Black individuals were disproportionally in class 2, whereas White individuals and those with public insurance were more frequently in class 1. Individuals with private insurance or who were nulliparous were more often in class 3. Multimorbidity is prevalent among pregnant individuals, demonstrating the need for integrative approaches for preconception and perinatal healthcare to manage and treat chronic conditions in pregnancy.

TITLE: Residential Mobility During Pregnancy and Birth Outcomes in the United States: the Environmental influences on Child Health Outcomes (ECHO) Cohort (2010-2019)

ABSTRACT:

The residential environment is a determinant of prenatal and child health. Yet, families move and residential mobility can lead to measurement error and exposure misclassification. We compared characteristics of movers and non-movers and described moves to understand the potential for exposure misclassification in neighborhood level exposures among pregnant persons in the Environmental influences on Child Health Outcomes (ECHO) Cohort between 2010 and 2019. We identified 16,898 pregnant persons with residential history data collected from 44 cohort sites across the continental US and Puerto Rico. We compared mobility groups based on individual characteristics including: participant race, ethnicity, age at delivery, marital status, delivery year, annual household income, education, and employment status as well as by neighborhood characteristics including median neighborhood income (Census tracts), urbanicity, Social Vulnerability Index (SVI), and percentage below the federal poverty level, with a high school diploma, and employed. We also described distance of moves (i.e., within tract and between tracts, counties, and states). About 9% of participants moved at least once during pregnancy (mean: 1.1 moves, range: 1-5). Among those who moved, 7% moved across states, 32% across counties, 85% across tracts, and 17% within tracts. Approximately 70% of non-movers had some college education or higher compared to 75% of movers. Amongst movers, between tract movers had the lowest percentage some college education or higher (74%) compared to between state movers with the highest (81%). On average, pregnant people initially moved to higher income and less socially vulnerable neighborhoods. With almost 10% of the sample moving during pregnancy, findings inform the need to account for residential mobility on birth outcomes and accurately characterize the types of neighborhoods where pregnant persons reside across pregnancy.

TITLE: Associations of a mixture of whole blood metals with incident uterine leiomyomata in a prospective cohort study

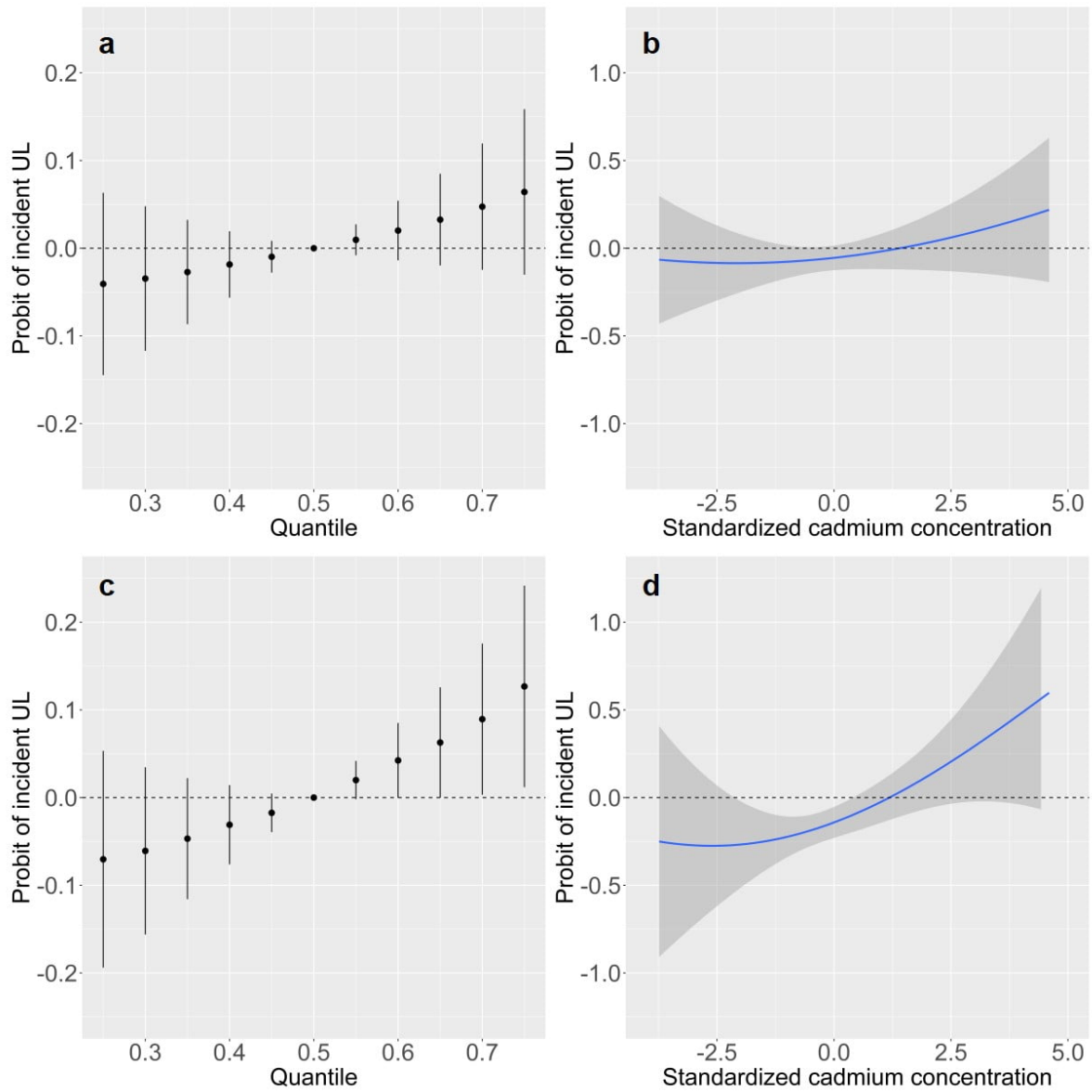
ABSTRACT:

Background: Uterine leiomyomata (UL) are a major cause of gynecologic morbidity. Metals may influence UL risk through mechanisms including endocrine disruption. The health effects of metals may differ by vitamin D status. Our objectives were to estimate associations of a whole blood metal mixture with incident UL, overall and among vitamin D-deficient participants (25[OH]D <20 ng/mL).

Methods: We analyzed data from the Study of Environment, Lifestyle and Fibroids, a Detroit-area prospective cohort study of 1,693 Black individuals with an intact uterus, age 23-35 years at baseline (2010-2012). At baseline, participants provided non-fasting blood samples, in which we measured concentrations of 17 metals in whole blood and 25(OH)D in serum. Participants underwent ultrasonography at baseline and 20 months for detection of UL. We used Bayesian Kernel Machine Regression to estimate associations of the metal mixture with probit of incident UL, adjusting for age, BMI, parity, recent injectable contraceptive use, and current smoking.

Results: Among 1,132 participants UL-free at baseline, 117 (10%) developed UL within 20 months. The metal mixture was positively associated with probit of UL (e.g., all metals at their 75th vs. 50th percentiles, $\beta=0.06$, 95% credible interval [CrI] -0.03, 0.16). The overall mixture association was stronger among vitamin D-deficient participants (n=820): $\beta=0.13$, 95% CrI 0.01, 0.24, for all metals at their 75th vs. 50th percentiles. Increasing cadmium from its 25th to 75th percentile was associated with $\beta=0.03$ (95% CrI -0.05, 0.11) higher probit of UL overall; $\beta=0.13$ (95% CrI 0.02, 0.24) among vitamin D-deficient participants.

Discussion: A mixture of metals measured in whole blood was weakly positively associated with incident ultrasound-detected UL during 20 months of follow-up, with a stronger association among vitamin D-deficient participants. Associations were driven by cadmium, which increases UL tissue proliferation in vitro.



- (a) Overall mixture association in full cohort (n=1132).
 (b) Univariate exposure-response plot for cadmium in full cohort.
 (c) Overall mixture association among vitamin D-deficient participants (n=832).
 (d) Univariate exposure-response plot for cadmium among vitamin D-deficient participants.

TITLE: Seasonal short term exposure to fine particulate matter (PM2.5) and risk of pre-term and postneonatal infant mortality in Michigan 2006-2016: a case crossover study

ABSTRACT:

Introduction: Ambient air pollutants such as fine particulate matter (PM2.5) are known to have deleterious impacts on adult cardiovascular and respiratory health. However, the impacts of gestational and infant PM2.5 exposures on infant mortality are not well understood.

Methods: All records of natural deaths in children whose date of death occurred on or up to 365 days after birth were extracted from the Michigan Department of Health and Human Services (MDHHS) vital statistics database. Records denoted pre-term birth related deaths. Using a gridded raster of PM2.5 concentrations estimated from satellite imagery, PM2.5 estimates at the home address of the decedent for each of the previous 14 days were created. A case crossover design within a distributed lag non-linear model (DLNM) framework was used to assess risk of infant mortality up to lag 14 days of exposure to PM2.5 for all deaths, deaths among pre-term infants, and postneonatal deaths from respiratory causes. We also tested for effect modification by race, comparing associations for Black and white decedents.

Results: In Michigan, 8,368 infants died before their first birthday between Jan 1, 2006 and Dec 31, 2016. The absolute average exposure for Black mothers and infants was higher than for other groups. Long term exposure (up to 14 day lags) to extreme levels (90th percentile) of PM2.5 was not significantly associated pre-term and postneonatal mortality both together and separately. However, there was a positive though non-significant association of PM2.5 and preterm mortality up to lag day 14 during the Winter months.

Conclusions: Further investigation into the seasonal differences in the association of PM2.5 exposure with pre-term infant mortality may reveal other important factors that contribute to infant mortality. Black infants in contexts similar to Michigan may be particularly susceptible to deleterious impacts from PM2.5 exposure.

TITLE: Associations of neighborhood social cohesion with obesity and long-term changes in BMI - The Maastricht Study

ABSTRACT:

Objective: The role of the social environment can facilitate positive health behaviors to prevent chronic cardiometabolic conditions. We aim to examine the associations of neighborhood social cohesion, independent of the obesogenic environment, with obesity, and changes in BMI over time.

Methods: A total of 7,641 participants from The Maastricht Study between the ages of 40 and 75 years were analyzed. Weight and height were measured at baseline; and weight was self-reported annually up to 10 years of follow-up (median= 4.7 years). Perceived social cohesion was measured by a questionnaire at baseline. Home addresses for each participant were linked to geographic information system (GIS) data from the Geoscience and Health Cohort Consortium (GECCO) to create neighborhood exposure variables including objectively measured social cohesion, neighborhood walkability, and food environment within a 1000m Euclidian buffer. Linear and logistic regression analyses, adjusted for socioeconomic variables, were performed with BMI and obesity status. A mixed model analysis was carried out to examine longitudinal changes in BMI with social cohesion.

Results: Living in the highest quartile area of social cohesion was associated with lower BMI compared to the lowest quartile using both perceived (Q4 B: -.53; 95% CI = -.79, -.28) and objective measures (Q4 B: -.97; 95% CI = -1.29, -.65). Those in the highest quartile of social cohesion were less likely to be obese compared to the lowest quartile also using both perceived (Q4 OR: .73; 95% CI = .61, .88) and objective measures (Q4 OR: .50; 95% CI = .39, .63). There were no longitudinal changes in BMI between social cohesion quartiles using perceived and objective measures.

Conclusion: Neighborhood social cohesion was associated with lower BMI and lower odds of obesity classifying it as a non-conventional obesogenic area characteristic that has an impact on weight, independent of conventional built environment features.

TITLE: Belonging in Academia: Comparing Perceptions of Institutional Engagement and Inclusion by Sexual Orientation in a Medical School Community

ABSTRACT:

Inclusion and diversity remain a critical goal for medical school communities. Yet, it remains unknown whether professionalism and belonging is experienced differently by lesbian, gay, bisexual, transgender, or queer (LGBTQ) identifying individuals. The Diversity Engagement Survey was sent to faculty, trainees, staff, and students across three health systems and five health professional and graduate schools at the University of Pennsylvania in 2015, 2018, and 2021. Institutional vision, camaraderie, appreciation, and professionalism scores, institutional welcoming and visibility of LGBTQ individuals, comfort in working with LGBTQ colleagues, and likelihood of considering changing jobs were assessed using linear and Poisson regression, as applicable, weighted for changes in the sample demographics over years, and adjusted for age, race/ethnicity, gender, affiliation, position, location, and year. From 18,485 respondents, 82% identified as heterosexual, 9% as LGBTQ, and 9% declined to answer. LGBTQ individuals reported lower institutional engagement compared to heterosexual individuals [vision: RD=-1.31 (95%CI -1.87, -0.75); camaraderie: RD=-1.02 (-1.37, -0.67); appreciation: RD=-0.84 (-1.17, -0.51); professionalism: RD=-0.27 (-0.42, -0.12)]. LGBTQ respondents were less likely to agree that there was institutional LGBTQ visibility [RR=0.90 (0.85, 0.97)], that their institution was welcoming of LGBTQ individuals (RR=0.88 (0.85, 0.91)) and that the institution had a culture that values respect and tolerance for all (RR=0.94 (0.90, 0.97)). LGBTQ individuals were more likely to report comfort in working with their LGBTQ colleagues (RR=1.02 (1.01, 1.03), and to consider changing jobs because of unprofessional behavior at work (RR=1.21 (1.08, 1.36)). These findings highlight inequalities based on sexual orientation across many domains in the workplace and that comprehensive initiatives are needed to improve the work environment and sense of belonging for LGBTQ individuals.

TITLE: Local Labor Market Structure and Drug Mortality in the United States

ABSTRACT:

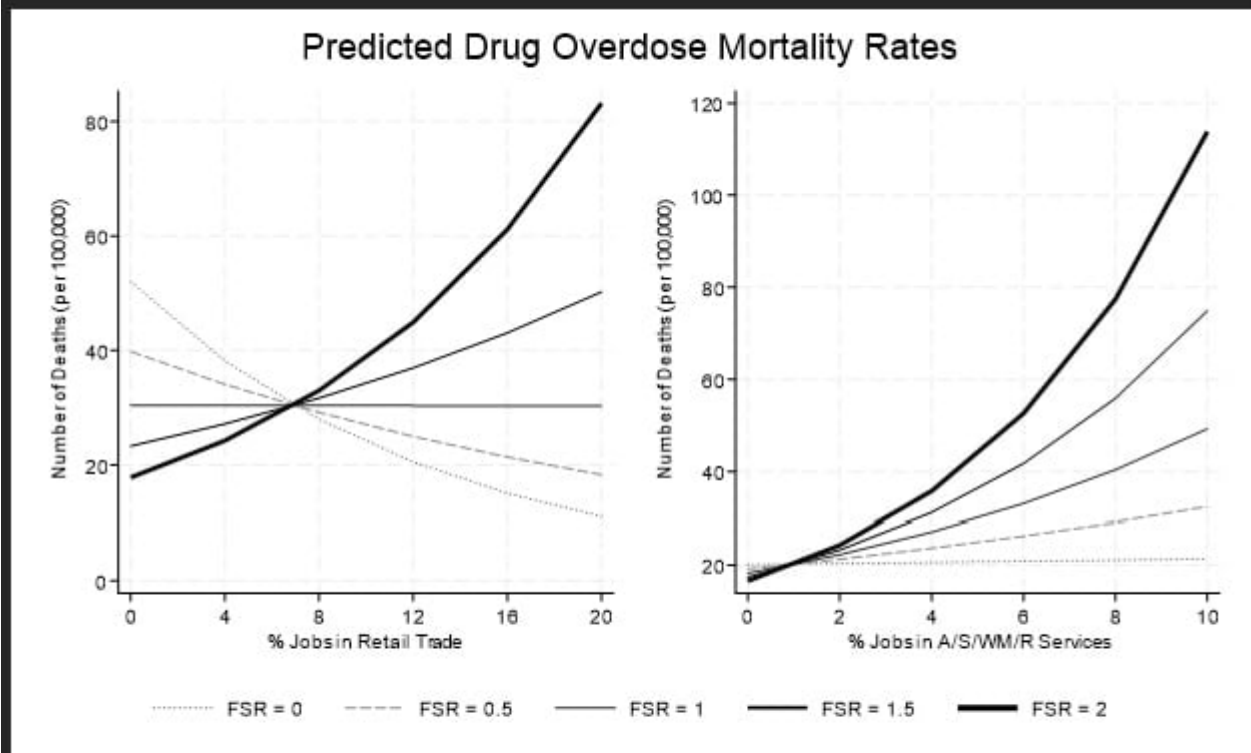
Background: Drug mortality risks vary among industries, potentially creating distinctive geographic patterns across US counties. While industry-specific drug mortality is well understood, less is known about how local labor market structure relates to drug mortality in the late 2010s, driven by synthetic opioids. This study investigates the relationship between industry-specific job compositions and drug mortality at the county level and the moderating effects of fentanyl's presence in illicit drug supplies.

Methods: Data were derived from the National Center for Health Statistics' Multiple Cause of Death, linked with four other sources on industry-specific job counts, drug supply, and other county-level contextual characteristics from the US Census Bureau, CDC, and Drug Enforcement Administration. Negative binomial regressions were used to test the associations between industry-specific job compositions and drug mortality rates of 2,060 US counties while controlling for sociodemographic and drug-supply factors and the moderating effects of state-level fentanyl seizure rates. Then, predicted drug mortality rates were computed for a range of industry-specific job percentages.

Results: Our models indicate negative associations between drug mortality and industries including manufacturing, retail trade, finance/insurance, and educational services. In contrast, a positive association was found for administrative/support/waste-management/remediation (A/S/WM/R) services. State-level fentanyl seizure rates had moderating effects on retail trade and A/S/WM/R services.

Conclusion: Counties with a higher concentration of A/S/WM/R service jobs need targeted efforts to mitigate drug overdose risks. Additionally, areas with higher concentrations of retail trade and A/S/WM/R service jobs, particularly when fentanyl seizure rates are higher, may require proactive measures to limit fentanyl circulation and implement harm reduction strategies for reducing overdose risks.

Predicted Numbers of Drug Overdose Mortality Rates by the Proportion of Jobs in Retail Trade and A/S/WM/R Services and Fentanyl Seizure Rates in US Counties, 2018-2021



Notes. A/S/WM/R = Administrative/Support/Waste Management/Remediation. FSR = State-Level Fentanyl Seizure Rates (computed by the number of fentanyl seizures per 1,000 residents). The range of the x-axis for each industry sector was based on the actual range observed among the analytic sample examined in this study. The predicted probabilities were estimated using the coefficient estimates from the final model in Table 3 (i.e., Model 3) while controlling other sociodemographic and drug supply-related factors at means.

TITLE: Reasons for alcohol and cannabis use among twelfth graders in the United States (2002 – 2021)

ABSTRACT:

Background: Alcohol and cannabis use are prevalent among US adolescents. While the lifetime prevalence of alcohol use has decreased over the past 20 years, lifetime prevalence of cannabis use has remained relatively stable. Examining trends in reasons for use over time may aid in prevention and intervention efforts through identification of presently salient reasons for use for adolescents. We describe and compare trends in reasons for alcohol use and cannabis use as reported by US 12th graders from 2002 to 2021.

Methods: We used publicly-available data from 12th graders participating in the Monitoring the Future study from 2002 to 2021. Students reported on substance use and the “most important” reasons for use (15 for alcohol; 13 for cannabis). Survey weights were applied to account for complex sample design. We calculated weighted lifetime prevalence of alcohol and cannabis use and weighted prevalence of reasons for use.

Results: Lifetime alcohol use prevalence decreased from 2002 (78%) to 2020 (60%) and fell further in 2021 (53%). Lifetime cannabis use prevalence remained stable from 2002 (48%) to 2020 (44%), with a decrease in 2021 (38%). The most prevalent alcohol use reason was “to have a good time with my friends” (2002: 70%; 2021: 70%), and experimentation increased over time (2002: 52%; 2021: 63%). For cannabis use, “to feel good or get high” (2002: 75%; 2021: 68%) and experimentation (2002: 63%; 2021: 54%) decreased over time, while relaxation increased (2002: 58%; 2021: 80%). “To have a good time with my friends” remained relatively stable (2002: 66%; 2021: 62%). Broadly, rankings of reasons prevalence for alcohol were stable over time, but changed for cannabis.

Conclusion: The most common reasons for alcohol use were social-related and experimentation, and, for cannabis use, relaxation and feeling good. Findings suggest differential prevention and intervention strategies may be needed.

TITLE: Racial and socioeconomic inequities in menstrual health among North American pregnancy planners

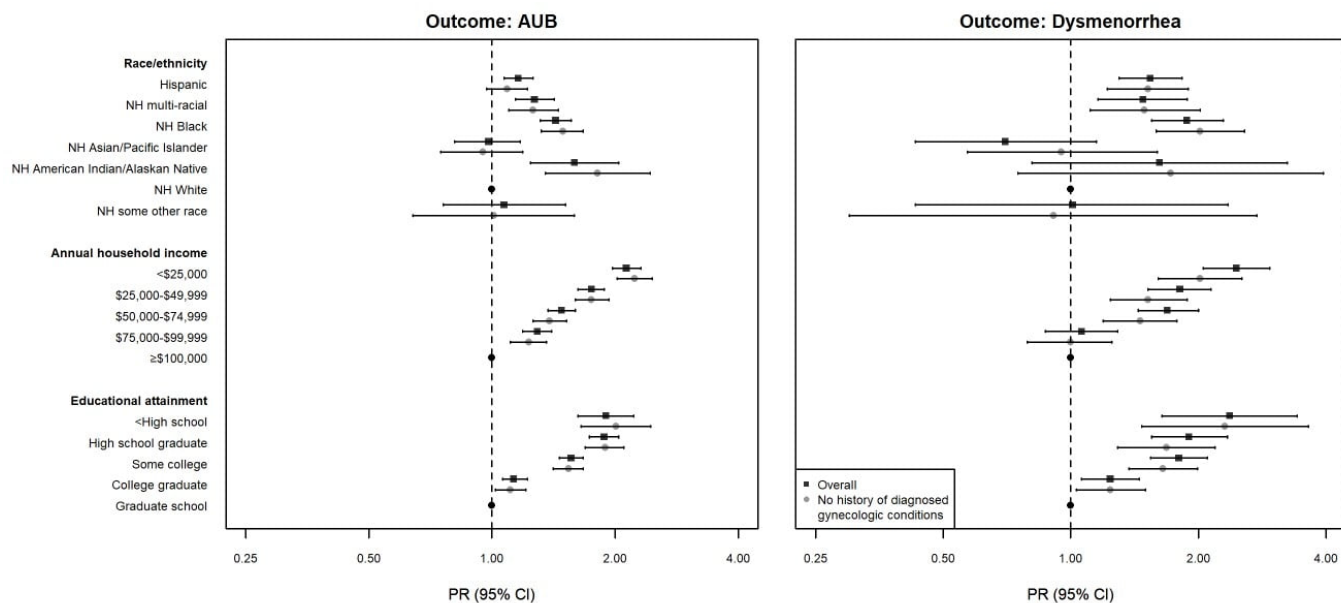
ABSTRACT:

Introduction: Abnormal uterine bleeding (AUB) and dysmenorrhea are debilitating conditions with significant impact on physical, social, and mental health. Little is known about racial and socioeconomic disparities in menstrual health.

Methods: We analyzed questionnaire data from 13,316 pregnancy planners in Pregnancy Study Online, a web-based North American preconception cohort study. Eligible participants were 21-45 years, assigned female sex at birth, and not using contraception or fertility treatment. We used age-adjusted log-binomial regression models to estimate prevalence ratios (PRs) and 95% CIs for the associations of race and ethnicity, income, and education with AUB (irregular cycles, cycle length <24 or >38 days, duration of flow ≥ 7 days, and/or heavy flow) and dysmenorrhea (menstrual cramps requiring medication and bed rest). We ran sensitivity analyses restricted to participants without diagnoses of endometriosis, fibroids, or polycystic ovarian syndrome.

Results: Income and education were monotonically inversely associated with prevalence of AUB and dysmenorrhea. For example, relative to participants with incomes $\geq \$100\text{k}/\text{year}$, PRs (95% CIs) for AUB among those with incomes \$75k-\$99k, \$50k-\$75k, \$25k-\$49k, and $< \$25\text{k}/\text{year}$ were 1.29 (1.19-1.40), 1.48 (1.37-1.60), 1.75 (1.62-1.88), and 2.13 (1.97-2.31), respectively. Relative to non-Hispanic White participants, PRs (95% CI) for AUB and dysmenorrhea were higher among Hispanic (1.16 [1.07-1.26] and 1.54 [1.30-1.83], respectively), non-Hispanic Black (1.43 [1.31-1.56]) and 1.88 [1.55-2.29], respectively), and non-Hispanic American Indian/Alaskan Native (1.59 [1.24-2.04] and 1.62 [0.81-3.24], respectively) participants. Associations persisted when restricting to those without diagnosis of reproductive conditions.

Conclusions: In this North American preconception cohort study, we observed strong racial and socioeconomic disparities in menstrual health, indicating the potential for social and structural drivers.



TITLE: Awareness of Human Papillomavirus (HPV) and its vaccine and Telehealth: Results from the Health Information National Trends Survey (HINTS) 6, 2022 in the United States

ABSTRACT:

Background: Human Papillomavirus (HPV) vaccination is essential to prevent occurrences of a variety of HPV associated cancers. The awareness of HPV and its vaccine could be associated with the use of telehealth. The aims of this study were to examine the association between awareness of HPV and HPV vaccine with receiving telehealth for health care within the past year.

Methods: Data from the Health Information National Trends Survey (HINTS) 6 (N=5,887) were utilized. Dependent variable was awareness of HPV and HPV vaccine. The independent variable was those who received care from a doctor or health professional using telehealth. Weighted multivariable logistic regression was performed to determine association of awareness of HPV and its vaccine with receiving healthcare using telehealth while adjusting for age, gender, race, education, and census region.

Results: The study sample consisted of 68.28% awareness of HPV and 63.47% awareness of HPV vaccine. After controlling for covariates, we found those who were aware of HPV and HPV vaccine have received telehealth care (aOR=1.40, 95%CI:1.11-1.78; aOR= 1.40, 95%CI:1.09 -1.80), respectively. In the adjusted model, the awareness of HPV for being female (aOR=2, 95%CI:1.60-2.48) and college graduates (aOR=3.80, 95%CI: 2.59-6.56). In the adjusted model, the awareness of HPV vaccine for being female (aOR= 2.68, 95%CI:2.13-3.36) and college graduates (aOR=4.68,95%CI:2.77-7.91). HPV and HPV vaccine awareness, Non Hispanic Whites had significantly higher adjusted odds compared to other race/ethnicity groups.

Conclusion: Hence public health programs could be directed to promote use of telehealth to increase awareness of HPV causing cancers, reduce stigma associated with vaccination, boost healthcare recommendation and uptake of HPV vaccination considering socio demographic factors.