Practicum Abstracts 2024

Degree: MPH-45

Field of Study: Epidemiology

Project Title	Project Summary or Abstract
The Association Between Social Media Use and Psychological Well-being Among Cancer Survivors; Data from Health Information National Trends Survey	Background Research on social media (SM) usage and psychological outcomes has yielded mixed findings, with no consensus reached on. Therefore, our study aims to investigate the relationship between SM use and psychological well-being among cancer survivors. Methods This is a cross-sectional study that utilized the HINTS 6 publicly available dataset, comprising data collected between March 7, 2022, and November 8, 2022, which includes 6,252 participants with civilian, non-institutionalized adults aged 18 or older population living in the United States. Individuals with a history of cancer were included in the study and after excluding missing values, a total of 855 patients were analyzed. Ordinal logistic regression analysis was conducted, adjusting for confounders; age, sex, race, partnership status, educational level, occupational status, and income. Results Multivariable analyses (adjusted for age, sex, race, partner status, educational status, occupational status, and income variables) indicated no statistically significant relationship between social media exposure and psychological distress. However, a significant association was found between social media exposure and feelings of social isolation. The odds of feeling social isolation were 1.66 times higher in cancer survivors with social media exposure compared to those without social media exposure. (95% CI: 1.08 - 2.56). Conclusions This research significantly contributes to existing literature by elucidating that exposure to social media is associated with increased feelings of social isolation among cancer survivors. Furthermore, while not reaching statistical

	significance, the study identifies a notable trend towards elevated levels of psychological distress with increased social media usage, this highlights a pressing need for public health interventions to address this issue.
Financial Toxicity and Its Impact on Mental Health Outcomes in Cancer Survivors During the COVID-19 Pandemic	Background: Financial toxicity is increasingly recognized as a critical issue affecting cancer survivors, particularly impacting mental health outcomes. With the added stress of the COVID-19 pandemic, the mental health of survivors experiencing financial hardship may be at greater risk. This study investigates the correlation between financial toxicity and mental health outcome among cancer survivors during the pandemic. Methods: Utilizing data from the National Health Interview Survey (2019-2022), this cross-sectional study analyzed responses from 15,041 cancer survivors, corresponding to a weighted national population of 97,060,651. We assessed the prevalence of financial toxicity and its association with depression, generalized anxiety disorder (GAD), and severe psychological distress (SPD), using logistic regression models to adjust for potential confounders. Results: Findings demonstrated a significant relationship between financial toxicity and increased risk of depression, with an adjusted odds ratio (OR) of 2.58. Poor health (OR=2.96), female (OR=1.80), cognition difficutly (OR=5.10), public insurance (OR=1.44), obesity (OR 1.52), divorced/separated (OR 1.81), and having a none-straight sexual orientation (OR: 2.21) also play an important role. During the COVID-19 Alpha (OR=1.22) and Omicron (OR=1.29) variant peaks, the odds of depression increased as well. The adjusted model also confirmed the increased risks for GAD (OR=2.59) and SPD (OR=3.01). Conclusion: The study confirms a substantial association between financial toxicity and mental health disorders in cancer survivors, heightened during the pandemic. The findings underscore the need for comprehensive survivorship care that integrates financial and mental health support, particularly during global health crises. Future research should focus on intervention strategies to mitigate the mental health impact of financial toxicity.
Heterogeneity of Parkinson’s Disease from an epidemiological perspective: prediagnostic metabolomic signature of hyposmia	Background: Parkinson's disease (PD) represents a significant and escalating global public health challenge, with its prevalence expected to continue rising sharply. Despite significant progress in understanding the risk factors associated with PD, the disease's heterogeneity, including the specific risk factors for its subtypes, remains insufficiently explored. Among the most prevalent non-motor symptoms, hyposmia—a diminished sense of smell—is noted for its relative stability over the course of the disease, making it a particularly interesting focus for subtype-specific research. This study aims to investigate the prediagnostic metabolomic signatures that distinguish PD patients with and without hyposmia.

	Methods: This study conducted a nested case-control analysis within the Nurses' Health Study and the Health Professionals' Follow-up Study, utilizing blood samples for metabolomic profiling via liquid chromatography-mass spectrometry. Our analysis included 204 participants who developed PD and 204 matched controls, aiming to identify metabolomic biomarkers for PD subtypes with and without hyposmia. Statistical analysis was performed using conditional logistic regression. Results: The final number of metabolites included in the analyses was 289. We identified two metabolites associated with PD with hyposmia and ten with PD without hyposmia, suggesting potential metabolic differences between subtypes. However, none of these metabolites maintained statistical significance after adjusting for multiple comparisons. Conclusions: The study reveals a potential prediagnostic metabolic distinction in PD with and without hyposmia, although the identified differences in metabolite concentrations did not remain significant after adjusting for multiple comparisons. These results underline the complexity of PD's metabolomic landscape and highlight the importance of further research.
The Associations of Mitragynine, Opioids, Other Substances and Socio-demographic Variables to Drug Intoxication-Related Mortality (DIRM)	Abstract Introduction: The US drug intoxication-related mortality (DIRM) rate increased by 257%- from 7.81/100,000 deaths in 2000 to 20.07/100,000 deaths in 2015 among people 15 years old and above. Opioids, mainly fentanyl, were the main driver of drug overdose deaths. However, the contribution of kratom (mitragynine) in drug overdoses or intoxication is seldom reported. Methods: Our cross-sectional study examined the associations of kratom (mitragynine), opioids, other substances, and sociodemographic variables with drug intoxication. We used descriptive statistics to describe the decedent's characteristics and regression modeling to examine the association of the exposures to DIRM. Results: A total of 30 845 cases were included in the analysis. Five hundred fifty-one cases of decedents were kratom users. More males died from DIRM (81.5%), primarily white (95.1%), among the 35-44 years old (40.5%). Among kratom users, 484 (87.8%) died from DIRM. Only 36 cases used kratom as the sole substance, and other decedents used multiple substances (n=515 or 93%), of which 437 or 79.3%) used at least an opioid. Among kratom users, the

	odds of dying from DIRM were 5.6 times higher compared to non-mitragynine users after adjusting for confounders (aOR=5.6, 95% CI, 4.1-7.), p
EXPLORING RISK FACTORS FOR CORONARY ARTERY DISEASE THROUGH AN EXPOSOMIC APPROACH: A TWO-SAMPLE MENDELIAN RANDOMIZATION STUDY	Background: One-fifth of coronary artery disease (CAD) events are not associated with classical risk factors suggesting the involvement of other exposures. However, classical epidemiological studies have limitations to address them. Exposomic approaches could be leveraged by causal inference methods to identify new factors and guide hypothesis generation. Thus, we performed a two-sample polygenetic Mendelian randomization (MR) using a summarized-level exposomic database from genome-wide analysis studies (GWAS) and confronted it against two independent datasets of CAD to discover and validate exposures and their respective genetic variants. Methods: Primary analysis was performed with inverse variance weighted-multiplicative random effect model (IVW-mre). Robust methods corroborate directionality. Sensitivity analyses evaluated presence of pleiotropy, heterogeneity and corrected for outliers. In discovery phase we identified the best linkage disequilibrium window for posterior exposures' validation. Reverse MR was performed in case of potential reverse causality. Results: We identified three traditional risk factors and six potential non-traditional exposures associated with CAD. From this lastly, high education attainment (p< 0.0001), fluid intelligence score (p= 0.0096), job as health care manager (p< 0.0001), job at electronic product factory (p< 0.0001) and taking zolpidem (p< 0.0001) were considered protective. While taking atorvastatin as risk factor (p< 0.0001). Presence of pleiotropy cannot be ruled out based on funnel plot asymmetry. Reverse MR of fluid intelligence score versus CAD was not significant (p= 0.35). Conclusions: Our exposomic approach coupled with mendelian randomization identified potential non-traditional exposures for CAD that should be further explored at epidemiological and molecular biology level to confirm their causal pathways and guide public health policies.
The association between hypertension and hearing impairment	Hearing impairment (HI) is highly prevalent among older adults, impacting social participation and quality of life. While previous studies suggest a link between hypertension and HI, conflicting findings exist, possibly due to varying definitions of HI. This study aimed to investigate this association using WHO-defined criteria in a large, representative sample of the Canadian adult population. Data from the Canadian Longitudinal Study on Aging were analyzed. Hypertension (primary exposure) was self-reported at baseline. Covariates included age, sex, race, and education level.

	Crude and fully adjusted logistic regression models were employed to assess the association between hypertension and HI (at baseline and follow-up). Linear regressions were employed to assess the relationship between baseline hypertension and the pure-tone average at baseline and follow-up. Finally, separate linear regressions were utilized to investigate the association between baseline hypertension and changes in the pure-tone average at follow-up. Individuals with hypertension exhibited a 1.09-fold increased odds of HI compared to their counterparts without hypertension in cross-sectional analyses. The OR for disabling HI stood at 1.11 in individuals with hypertension. In addition, those with baseline hypertension had a 1.14-fold higher odds of incident HI at follow-up. Linear regression analyses showed a significant association between baseline hypertension and the pure-tone average of hearing thresholds, both initially and at follow-up, although we found no association of hypertension to change in hearing thresholds over 3 years. Overall, this study suggests a modest association between hypertension and HI, supporting routine screening for HI in individuals with hypertension.
Racial/Ethnic Differences in Outcomes in Patients with Predominantly Antibody Deficiency (PAD): the 2017 National Inpatient Sample (NIS) database.	Background: Patients with Predominantly Antibody Deficiency (PAD) are at increased risk for infections, however, there is limited data on healthcare utilization and racial/ethnic disparities. We sought to examine hospitalization outcomes by race/ethnicity among patients with PAD. Methods: We included patients with PAD in the National Inpatient Sample (NIS) 2017 database. The primary exposure was race/ethnicity (White, Black, Hispanic, or Other). The main outcome was hospital total costs. Secondary outcomes included length of stay, discharge disposition, and in-hospital mortality. We examined unadjusted associations of each outcome by race/ethnicity. We then performed linear and logistic regression, adjusted for age and sex. Results: We identified a cohort of 8,342 patients with PAD (representing 43,425 patients nationwide) including patients identifying as White (6944[80.0%]), Black (415[4.8%]), Hispanic (565[6.5%]), and Other (418[4.8%]). In the unadjusted analysis, there was a significant association between race/ethnicity and total hospital costs, as well as for length of stay, in-hospital mortality, and discharge disposition. For the adjusted analysis, patients identifying as Other had $29969.60 more in total hospital charges compared with White patients. There was not a statistically significant difference for Black or Hispanic patients. Compared with White patients, Black and Other patients had longer lengths of stay. There were significant differences in discharge disposition for Black compared with White patients, but not for Hispanic or Other patients. Other patients had an increased risk of in-hospital mortality compared to White patients.

	Conclusions: We identified increased healthcare utilization and worse outcomes in PAD by race/ethnicity. Additional research and efforts are needed to address these disparities.
The impact of age on health-related quality of life (HRQoL) in patients with advanced prostate cancer	Title: The impact of age on health-related quality of life (HRQoL) in patients with advanced prostate cancer Authors: Qi Dong, MD, Lorelei Mucci, PhD Background: The impact of age on health-related quality of life (HRQoL) among newly diagnosed metastatic prostate cancer (PC) patients is not well-understood. This study evaluates HRQoL across different age groups. Methods: We conducted a secondary analysis of IRONMAN registry study data, comprising patients from the US, Canada England who were newly diagnosed with advanced PC between 2017 and 2023. Patients completed EORTC QLQ-C30 at baseline and every 3 months thereafter. Higher scores indicate better function and lower for symptoms. Multivariable linear regression was used to estimate the mean difference in scores by age at enrollment. Linear mixed-effects models were used to assess the longitudinal change after 1 year. Results: Among 1,406 participants, most were white, diagnose with mCSPC (vs. CRPC), and had a PSA level below 10 ng/mL. The youngest group (less than 60 years) reported comparable global QoL to the reference group (60-69 years). Older participants (70 years or older) reported better emotional and social functioning. Younger patients reported more financial insecurity, likely due to employment disruption. Conversely, older patients reported physical functioning decline. After one year, improvements are seen across most QoL scales across all age groups. Notably, all age groups show financial security improvement, with the least improvement in the oldest cohort. Conclusions: Distinct age-related HRQoL differences exists at new diagnosis of advanced PC, and all groups demonstrate similar trend of improvements after one year. These findings suggest that age-specific interventions for PC patients should be customized to meet individual needs.
Negative subjective-objective sleep discrepancy is correlated with incident hypertension but not increased risk of cardiovascular events or	Background: Sleep state misperception (SSM), the discrepancy between subjectively reported and objectively measured sleep duration occurs in up to 50% of individuals with insomnia disorder, the most common sleep disorder in the community. More recent neurophysiological evidence links SSM with cortical hyperarousal. There is accumulating evidence linking insomnia with hypertension and worse cardiovascular outcomes and cortical hyperarousal is thought to be the pathophysiological mechanism. However, there is no literature describing an association of SSM and cardiovascular risk.

mortality in the Sleep Heart Health Study	Methods: 3729 participants were enrolled in the Sleep Heart Health Study between November 1995 and January 1998 and were followed for an average of 5.3 years. Individuals were classified as having SSM by a misperception index score above the 75th percentile. The association of SSM with incident hypertension was determined using logistic regression; cardiovascular events and mortality by competing risks regression. Covariates included age, gender, race, smoking, apnea-hypopnea index, body mass index, diabetes, hypercholesterolemia, anxiety, depression, and insomnia. Results: Sleep underestimation was associated with a 30% higher odds of incident hypertension (OR 1.30, 95% CI 1.03, 1.65, p = 0.03). No other significant associations were found. Conclusions: SSM appears to be significantly linked with incident hypertension and this contribute to the evidence associating cortical hyperarousal with poor cardiovascular outcomes.
Outcomes of a Stroke Clinical Pathway for Children on Ventricular Assist Devices	Background: Given the paucity of evidence-based guidelines for management of strokes in pediatric patients on ventricular assist device (VAD) support, our center developed a comprehensive VAD stroke pathway that included algorithms for diagnosing stroke and management of ischemic strokes. These are the outcomes following initiation of a stroke pathway at our center. Methods: This was a retrospective study at a single pediatric center. VAD patients who had at least one stroke code or STAT head CT obtained for new neurologic concern were included in the study. Patients were divided into two cohorts, pre-pathway (PRE) and post-pathway (POST), based on whether they were on VAD support prior to or after stroke pathway implementation in February 2018. The outcome measure used to assess the stroke diagnosis algorithm was time from stroke code or stat CT order to first CT image. Outcome measures used to assess stroke management algorithms included days inactive on the waitlist and days anticoagulation held following stroke diagnosis, and number of subsequent head CTs. Wilcoxon rank sum and chi-square tests were used compare the groups. Linear, negative binomial and Cox regression analyses were used as indicated, with adjustment by stroke and device types. Results: Between January 1, 2013, and June 1, 2023, 74 patients (24 PRE and 50 POST) were included in the study. Over a median VAD support duration of 103 (54, 162) days, 134 head CTs (47 CTs PRE and 87 POST) were obtained for new neurologic concern. Of these CTs, time to first image significantly improved from PRE to POST; % of CTs with first image within 30 minutes also improved, from 28% PRE to 46% POST (p=0.039). Overall, 32 patients were diagnosed with a stroke (17 PRE, 15 POST) . Outcome measures for stroke management showed no significant improvement from PRE to POST. Median days inactive on the waitlist following stroke diagnosis decreased from 11 days PRE to 3.5 days POST,

	though not significant. There were no significant differences in outcome measures when adjusted for stroke or device types. Overall waitlist survival for the 32 stroke patients was no different PRE to POST. Conclusions: Implementation of a pediatric VAD stroke pathway improved time to first CT image for VAD patients with new neurologic concerns. There were no significant changes in metrics related to stroke management (e.g., number of subsequent head CTs obtained or days off anti-coagulation post stroke diagnosis), though there was suggestion of decreased inactive time on the waitlist. As strokes in pediatric VAD patients are low frequency events, further data collection is needed to assess the impact of a comprehensive pediatric VAD stroke pathway on overall outcomes.
Impact of the COVID-19 Pandemic on Child Maltreatment Analyzed through Emergency Department Visits in a Large Suburban California Children's Hospital	Background: The COVID-19 pandemic and associated lockdowns raised serious public health concerns regarding increases in child maltreatment given heightened family stress, uncertainty, and social isolation. However, mandated reporters completed fewer maltreatment reports likely due to reduced contact with children resulting from school and service closures, possibly leading to more serious harm prior to detection. Emergency department (ED) visits offer an alternative data source to examine pandemic-related changes in maltreatment. Methods: A retrospective study of ED visits examined child maltreatment diagnosis codes filed between January 1, 2017- June 30, 2022. Codes were distinguished according to maltreatment type (physical, neglect, sexual), and secondarily according to type of physical injury (musculoskeletal, head/spine), consult indicators (social worker, neuro, ortho), and ED disposition. Multivariable logistic regression analyses tested whether maltreatment type and secondary outcomes varied across time: pre-COVID, COVID, and post-COVID. Results: During the COVID-19 pandemic, odds of ED neglect visits increased 72%, while odds of physical maltreatment ED visits decreased 40%, both compared to pre-COVID. However, post-COVID, odds of physical maltreatment ED visits rose 88% compared to COVID. Odds of disposition to the hospital post ED maltreatment visit were higher during COVID and remained elevated post-COVID (54% and 76% above pre-COVID levels, respectively). Conclusions: ED data suggest increases in neglect ED visits during the COVID-19 pandemic. Although physical maltreatment visits decreased, the rise in hospitalizations suggests increased severity, possibly from delayed recognition and treatment. New strategies are essential to address child maltreatment during public health emergencies when access to mandated reporters is limited.
The association between pediatric brain arteriovenous malformation	Background: Multicenter data on clinical outcomes of pediatric brain arteriovenous malformation (PBAVMs) treatment in the U.S. is lacking. We aimed to characterize the risk of stroke or death from PBAVM hemorrhage, and determine whether high case volume centers have better admission outcomes.

hemorrhage with inpatient stroke and death: a hospital volume-outcome analysis of U.S. national database admission records	Methods: A retrospective cross-sectional analysis of the Kids' Inpatient Database (KID) 2016 and 2019 records was performed. Exposure group included patients aged less than or equal to 20 years identified by ICD-10 CM diagnosis q28.2 for cerebral AVM. The primary composite outcome was inpatient stroke or mortality and secondary outcome was discharge disposition: routine to home or non-routine. Covariates of interest included patient sex, age, race, household income, elective admission status, length of stay, hospital region, and total charges. Univariate and multivariate logistic regression analyses were performed using complete case analysis in Stata. Results: 1,957 PBAVM admissions were included: 414 (21.1%) with hemorrhage (240 males, 174 females, mean age 12.3 years) and 1,543 (78.9%) without (893 males, 650 females, mean 10.6 years). In multivariate analyses, PBAVM hemorrhage was associated with an increased odds of stroke or death (OR=2.49, p=0.002, 95% CI: 1.38-4.48), and decreased odds of routine discharge (OR=0.322, p=0.001, 95% CI: 0.240-0.432). Secondary analyses showed no outcome difference between high and low volume centers, although Children's hospitals had greater odds of routine discharge (OR=1.48, p=0.01, 95% CI: 1.10-1.98). Conclusions: PBAVM hemorrhage is associated with increased odds of stroke, death, and non-routine discharge. Inpatient care in dedicated Children's hospitals may improve odds of home discharge; central referral patterns for PBAVMS should be explored
Clinical Significance of Supraventricular Tachycardia during Pregnancy in Healthy Women	Background: Supraventricular tachycardias (SVT) are the most frequently encountered arrhythmias in pregnancy with unclear clinical significance. Objective: Report the prevalence, describe the management and explore the association between SVT and adverse obstetric outcomes. Methods: Cohort study of primiparous and multiparous women without history of cesarean section (CS), and with structurally normal hearts admitted in labor. The study group consisted of women with at least one SVT episode during pregnancy and the control group was randomly selected in a 4:1 ratio. Results: Of 141,769 women meeting the inclusion criteria, SVT diagnosis was confirmed in 122. 76 (age 33.2 plus minus 4.8 years) had at least 1 symptomatic and documented episode during pregnancy. In women with known SVT diagnosis prior to pregnancy, medical therapy was not associated with a lower risk of SVT recurrence (OR 1.07, 95% CI 0.41-2.80).

	However, catheter ablation prior to pregnancy was associated with significantly lower risk of SVT recurrence (OR 0.09, 95% CI 0.04-0.23). Women with SVT during pregnancy had higher incidence of CS (39.5% vs 27.0%. p=0.03), and preterm labor (PTL) (30.3% vs 8.6%, p less than 0.001). Adjusting for age and parity, SVT during pregnancy was an independent predictor of CS (OR 1.80 95% CI 1.03-3.10), particularly planned CS (OR 2.89 95% CI 1.06-7.89) and PTL(OR 4.37 95% CI 2.30-8.31). Conclusion: SVT during pregnancy is associated with increased risk for CS and PTL in healthy women. History of SVT should be sought as early as preconception counseling and a multidisciplinary approach is warranted for both prevention and management of SVT occurrence.
Development and validation of a clinical risk prediction rule to identify inflammatory arthritis at the point of rheumatology triage using routinely collected data	Background: Rheumatoid arthritis, the most common autoimmune inflammatory arthritis (IA), is a debilitating disease that can cause joint damage, deformity, and functional impairment if treatment is delayed. Accurate triage of referrals for joint pain is essential for timely diagnosis and treatment of IA. Methods: Prospective observational data (N= 184, 71% female, median age 56.4 years) from a large tertiary care center was used to derive a clinical risk prediction rule for the diagnosis IA versus non-IA, utilizing penalized and stepwise logistic regression modeling, adjusted for age, sex, c-reactive protein (CRP) and rheumatoid factor (RF). Internal validation was performed using 5-fold cross-validation and external validation assessed using the UK Biobank (N=2828). Model performance was assessed by the c-statistic (cvAUC) and the Hosmer-Lemeshow test. Results: In the derivation cohort, CRP had the strongest association with diagnosis of IA in both models, with other important predictors being sex and CRP twice the upper limit of normal in the stepwise model (cvAUC=0.72, .58,.85) and additionally RF and age in the penalized regression model (cvAUC=0.77, .59,.95). When applied in the UK biobank the AUC values decreased (0.54-0.55), however, limitations in accurately defining timing of incident arthritis in relation to CRP measurement indicate the need for validation in a cohort that better fits the target population and clinical setting. Conclusions: This simple prediction rule, utilizing demographic and laboratory data, performed well in discriminating

	IA from non-IA in the derivation population. Further validation in similar clinical settings is required to further refine the model and determine generalizability.
Pre- and post-transplant diabetes mellitus and the risk of infection and mortality after heart transplantation in the United States	Background: Reliable data regarding the association of diabetes mellitus (DM) after heart transplantation (HTx) and infections are lacking. We aimed to assess the association between pre- and post-HTx DM and hospitalizations for infections and mortality. Methods: Adult HTx recipients from the US Scientific Registry of Transplant Recipients transplanted between 1994 and 2021 and without previous or multi-organ transplants were included. Uni- and multivariable Cox proportional hazard models were used to assess the association of baseline DM (at time of HTx) and post-transplant DM (as a time-varying exposure) compared to no DM with the rate of hospitalizations for infections and all-cause mortality as the primary outcomes of interest. Results: A total of 53,219 patients were included, of whom 12,708 (23.9%) had DM at baseline. Compared to non-diabetic participants, participants with baseline DM were older (58 vs. 54 years, $p < .001$), more likely male (79% vs. 74%, $p < .001$), less likely of white race (67% vs. 72%, $p < .001$) and more likely transplanted due to ischemic cardiomyopathy (54% vs. 37%, $p < .001$). In multivariable Cox regression models, both, pre- and post-transplant DM were associated with higher rates of hospitalizations for infections (Hazard Ratio [95% confidence interval]: pre-HTx DM: 1.22 [1.18-1.27], post-HTx DM: 1.24 [1.16-1.32], both $p < .001$) and mortality (1.21 [1.17-1.25] and 1.3 [1.25-1.35], respectively, both $p < .001$). Both were also associated with higher rates of fatal infections, graft failure and renal replacement therapy as secondary outcomes. Conclusions: Both, pre- and post-transplant DM are associated with higher rates of hospitalizations for infection and mortality after HTx.
Diabetes is Associated with Worse Outcomes of Patients Admitted for Ischemic Stroke: Analysis of National Inpatient Sample	Background: Type 2 diabetes mellitus (T2DM) prevalence significantly increases the risk for acute ischemic stroke (AIS), as noted by Ingelfinger (2017), with a doubling in stroke incidence among diabetics. Taballat et al. (2021) observed rising hospital charges and shortened length of stay from 2005-2014 for National Inpatient Sample (NIS) diabetic stroke patients aged 18 and above, stressing the need for an updated analysis. Methods: The study analyzed inpatient outcomes (mortality, length of stay [LoS], charges) in AIS patients aged 18+ with T2DM, excluding type 1 and gestational diabetes, and hemorrhagic stroke. Using 2019 NIS data, we employed retrospective

	cohort study design. I utilized linear regression study design to analyze the outcomes (hospital length of stay, hospital costs,), which is a continuous variable with a dichotomous exposure (with or without diabetes). Models adjusted for demographics, stroke belt, comorbidities, and payer. Results: Our sample included 7,082,963 ischemic stroke hospitalizations, representing an estimated 5 35,414,815 hospitalizations nationwide. In the unadjusted model, T2DM significantly reduced mortality among AIS patients by -1.45% ($p < .001$, CI -1.72, -1.19); including stroke belt location and additional confounders yielded similar results. T2DM also significantly decreased total hospital costs and LoS across all models ($p < .001$). Conclusions: In AIS hospitalizations with T2DM, age category, gender, and race reduce in-hospital mortality, as corroborated by Tabbalat et al. (2021). Their study noted rising total charges, contrasting our findings. T2DM patients' access to primary care in 2019 may mitigate AIS risk. Further research is warranted to delineate demographic, comorbidity, location, and payer associations.
Glucose-lowering medication use trends in patients with Down syndrome and type 2 diabetes	Background: The risk of type 2 diabetes (T2D) and cardiovascular disease is higher in people with Down syndrome (DS) compared with the general population. However, the use of glucose-lowering medication (GLM) in this group, including the use of cardioprotective GLMs such as GLP-1 receptor agonists (GLP-1RA) and SGLT2 inhibitors (SGLT-2i), is not known. This study aims to evaluate the utilization trends of GLMs in adults with DS and T2D and their characteristics. Methods: Utilizing two large US health insurance databases (Optum and Medicare), we identified adults ≥ 18 years with diagnoses of DS and T2D who used any GLM [Metformin, Sulfonylureas (SU), Insulin, dipeptidyl peptidase 4 inhibitors (DDP4i), GLP-1RA, SGLT-2i, and thiazolidinediones (TZD)] between 2012 and 2022. We conducted a descriptive analysis of GLM use and over 60 patient characteristics stratified by year. Linear regression was utilized to test the change in proportion of GLM class use over the study period. Results: Metformin accounted for the highest proportion (58.9% to 76.6%) of all GLMs used at any point in the study. The proportion of use of cardioprotective GLP-1RA and SGLT-2i increased over time, particularly in the Optum database (p-trend < 0.001). SU use decreased over time (p-trend < 0.001) but remained the 2nd most used GLM. There was no evidence of consistent change in use of insulin or DPP4is in recent years.

	Conclusions: The landscape of GLM use among patients with DS and T2D is changing, and cardioprotective drugs are slowly accounting for a larger proportion of all GLM use in this population.
The contribution of vertebral fracture to degenerative changes of the spine	Vertebral compression fractures (VFs) and spinal degeneration are both common causes of back pain, particularly in older adults. Previous cross-sectional studies have shown a potential association between these entities, but there is limited evidence on the role of VFs in spinal degeneration. In this longitudinal study, we evaluated the association between prevalent VFs and the subsequent progression of facet joint osteoarthritis (FJOA) and intervertebral disc height narrowing (DHN), using data from the Framingham Heart Study Offspring and Third Generation Multi-Detector Computed Tomography study. Summary indices representing the total burden of each spinal parameter (VFs, DHN and FJOA) across levels T4/T5 to L4/L5 were calculated for each individual. We hypothesized that prevalent VFs are associated with worsening spinal degeneration (DHN and FJOA). The cohort included 1197 participants, of whom 370 (31%) had a baseline (prevalent) VF. The change in summary index of DHN over the follow-up period was significantly higher in those with versus without prevalent VF (difference in ΔDHN 0.38, 95% CI 0.18 to 0.59, $p < 0.0001$), but the change in summary index of FJOA was similar between those with and without prevalent VF. However, once adjusted for age, sex, cohort, smoking status, body mass index, physical activity, and baseline value, the change in summary index of DHN was no longer statistically significant. However, there was a significantly higher change in the summary index (SI) of FJOA in those with versus without prevalent VFs in the fully adjusted model (difference in ΔSI 0.69, 95% CI 0.02-1.35, p=0.042). There was greater change in the summary index of FJOA with increasing severity of prevalent VF (linear trend p=0.015). Beyond the established morbidity and mortality associated with VFs, our study suggests that VFs may also lead to worsening spine osteoarthritis.
Urban-Rural Differences on all-cause mortality and cancer-specific mortality in Cervical Cancer Patients with Advanced Disease at	Title: Urban-Rural Differences on all-cause mortality and cancer-specific mortality in Cervical Cancer Patients with Advanced Disease at Diagnosis between 2008-2018 Authors: Adina M Pelusio1, MS; Pagona Lagiou, MD1, PhD, Ellen McCarthy, PhD, MPH1 Affiliation: 1Harvard T.H. Chan School of Public Health

Diagnosis between 2008-2018	Background: Rural living is correlated with advanced staging and poorer survival1,2. However, cervical cancer treatment has evolved since 2008, the last year residency-based outcomes were compared. More recent data is needed to assess the impact of rurality on survival. Methods: This is a retrospective cohort study. The sample was constructed using the SEER 17 database and yielded 11,545 regionally-advanced and 4,505 metastatic cervical cancer patients diagnosed between 2008 and 2018 with data on their county residence and survival. The primary exposure was rurality designation, based on USDA definitions. The primary outcome, overall survival, was assessed using the Cox Proportional Hazards model and Kaplan-Meier estimator. A secondary outcome, cancer-specific survival, was assessed using logistic regression. Analyses were adjusted for age group, race-ethnicity, marital status, and income. Results: The median survival of regionally-advanced patients was greater than metastatic patients (Figure 1). When unadjusted, metastatic patients had no risk difference compared to patients living in urban areas. However, rural patients had a higher risk of death in unstratified (hazard ratio [HR], 1.09, 95% CI 1.03-1.16) and regionally-advanced groups [HR: 1.09, 95% CI 1.01-1.18]. This association did not persist when adjusted for confounders (Table 2). The Kaplan-Meier curve likewise supports these findings with no separation in the metastatic, but limited tail-end separation in regionally-advanced strata. Conclusions: Results reveal that rurality was not associated with overall survival in advanced cervical cancer, when adjusted. While surprising, this analysis could reflect improvements in treatment effectiveness or accessibility. Further studies incorporating localized disease, longer observation, and additional covariates are warranted. References: 1. Fogleman, A.J., Mueller, G.S. and Jenkins, W.D. (2015). Does where you live play an important role in cancer

	incidence in the U.S.? American Journal of Clinical Research, 15(5(7)), pp.2314–2319. 2. Singh, Gopal K. “Rural-urban trends and patterns in cervical cancer mortality, incidence, stage, and survival in the United States, 1950-2008.” Journal of community health vol. 37,1 (2012): 217-23.
Polycystic Ovary Syndrome and Endometriosis Diagnosis Disparities by Sexual Orientation and Gender Identity: Moderation by Race/Ethnicity and Health Insurance Status	Background: Sexual and gender minorities (SGM) experience reproductive health disparities compared to their heterosexual and cisgender peers. Previous studies on PCOS and endometriosis diagnosis across SGM-status have had conflicting results, and this study aims to understand whether diagnosis disparities are moderated by race/ethnicity and/or insurance status. Methods: Survey data from the Fall 2019–Spring 2020 National College Health Assessment were analyzed. The sample was comprised of students ages 18–25 whose sex assigned at birth is female (n=48,268). We fit eight log-binomial regression models controlling for age to estimate the prevalence of PCOS or endometriosis diagnosis by sexual orientation or by gender identity. Moderation was assessed on both the multiplicative (ratio of ratios) and additive (relative excess risk due to interaction [RERI]) scales. Results: SGM individuals had a higher prevalence of PCOS and endometriosis diagnoses compared with heterosexual and cisgender peers. A positive multiplicative interaction was found for PCOS diagnoses, indicating non-Hispanic white sexual minorities had a higher prevalence compared to racial/ethnic minority heterosexuals (interaction risk ratio: 1.27; 95% CI: 1.03–1.57), though this interaction was not found on the additive scale (RERI: 0.26; 95% CI: 0.00–0.52). We did not find significant evidence of effect measure modification in any other model. Diagnosis prevalence was highest among SGM individuals who were non-Hispanic white and SGM individuals with health insurance. Insurance status did not moderate the relationships between diagnosis, sexual orientation, or gender identity. Conclusions: PCOS and endometriosis diagnosis disparities exist between SGM individuals and heterosexual and cisgender peers.
Disentangling Plasmodium falciparum genetic relatedness networks to study	Background: Despite advances in infectious disease control, 600,000 people still die annually from malaria. Genomic surveillance and genetic relatedness analyses have emerged as a powerful tool for studying infectious disease transmission. At present, genetic relatedness is applied in transmission studies and drug resistances surveillance. Relatedness network

malaria transmission across Senegal	studies are limited to visual analyses and have not been quantitatively characterized. Network science has developed statistical metrics to study these complex connectivity structure. We aim to apply these to quantify malaria genetic relatedness networks across Senegal. Methods: This retroactive whole-genome sequence study include 848 single-strain P. falciparum samples collected across eight sites in Senegal during 2019, 2020 and 2022. Sites ranged in incidences from 2.7‰ – 369.3‰ (cases/ thousand/year). Relatedness coefficients were calculated using a Hidden Markov Model, network visualization was carried out in Gephi (ForceAtlas2 algorithm). Network metrics, such as degree centrality and graph density were calculated using NetworkX. Ordinary least squared regression (OLS) was carried out to characterize the correlations of these metrics with incidence. Results: Networks showed visual differences, generally higher relatedness and interconnectivity at lower incidences and more diffuse structures at high incidences. Subsequent OLS analysis showed that six network statics correlated most strongly with log incidence. The top three being average edge weight (R2 0.406), graph density(R2 0.367), average clustering coefficient(R2 0.352). Conclusions: The analysis revealed structured changes in genetic relatedness networks as transmission intensity declines and provides quantitative insights into how genetic relatedness evaluate changes in malaria transmission. This study provides baseline expectations for how transmission intensities affect network structures quantitatively and allow us to explore how other transmission changes alter network structures.
Understanding Tuberculosis Prevalence and Risk Factors in Remote Australian Aboriginal Communities:	The practicum project was conducted in a remote Australian Aboriginal community with a TB cluster outbreak. The aim of the project was to better understand the prevalence of TB in the community to both direct future screening activities as well as understand risk factors that may be mitigated. Demographic and clinical data were collected from 624 Aboriginal residents over the course of seven months, from July 2023 to February 2024. This data collection aimed to analyze both latent TB and active TB cases within the community.

A Cross-Sectional Study in Pukatja, APY Lands	To identify potential risk factors associated with TB prevalence, various factors such as age, marijuana use, TB contact history, chronic lung disease, and smoking habits were examined. These factors were chosen based on prior knowledge of their potential association with TB infection or progression to active TB disease. The study employed statistical analysis techniques, including univariate and multivariate logistic regression, to assess the relationship between these factors and TB prevalence. By controlling for potential confounders such as age and medical history, the aim was to isolate the effects of specific risk factors on TB prevalence within the community. Overall, the project contributed valuable insights into the TB burden within remote Aboriginal communities and provided evidence to inform targeted public health interventions aimed at mitigating TB transmission and improving control measures in resource-constrained settings.
Understanding the likelihood of missed appointments for veterans scheduled in asynchronous tele-ophthalmology programs	BACKGROUND: This study's purpose was to analyze the likelihood of missed appointments for unhoused veterans in VISN 23 initially scheduled in asynchronous telehealth relative to those scheduled in face-to-face clinic (F2F) visits, to evaluate the quality of teleophthalmology services. METHODS: This was a retrospective cohort study in VISN 23 including unhoused veterans scheduled for telehealth or F2F eye clinic visits from 01/01/2018 to 12/14/2023. Exclusion criteria were prior stroke, dementia, or recent hospitalization within 90 days of the first appointment. Logistic regression assessed missed appointment odds between telehealth and F2F, adjusting for age, gender, rurality, race, TBI, DM, or mental health disorder. A secondary analysis examined the odds of missed follow-up after an attended telehealth vs. attended F2F visit. RESULTS: 6,219 unhoused veterans were included in the cohort. 5,831 veterans were scheduled in F2F, and 388 veterans were scheduled in telehealth. Adjusted, veterans scheduled in telehealth had a nonsignificant higher likelihood of missed appointment (OR=1.15, 95% CI (0.91, 1.44), p=0.24). The odds of veterans missing their first follow up after telehealth visits were lower but nonsignificant (OR=0.92, 95% CI (0.45, 1.89), p=0.8). Racial disparities were most significant for missed telehealth appointments for Native American/American Indian (OR=1.71, 95% CI (1.31, 2.23), $p < 0.001$) and non-Hispanic Black (OR=1.6, 95% CI (1.39, 1.85), $p < 0.001$) veterans. Disparities persisted for non-white veterans in follow-up appointments (OR=1.54, 95% CI (1.12, 2.10), p=0.01).

	CONCLUSIONS: The initial appointment type did not significantly impact the odds of missed appointment or follow-up. However, significant racial disparities necessitate immediate investigation.