

Room 308 Poster Session 1 Abstracts

Thandi Nixon

(Industry) Immunology and Public Health

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Heat stress describes the effect of elevated environmental temperatures on livestock production and health. Accumulating evidence indicates that heat stress adversely impacts chickens' productive and reproductive performance and alters the development and function of the immune system. Moreover, it causes degeneration of the lymphoid organs, consequently reducing the level of circulating antibodies and leukocyte count and increasing birds' susceptibility to infection. This may explain why disease outbreaks are more frequent in summer months and tropical climates. The annual economic losses associated with heat stress in the US poultry industry were estimated to be \$165 million. Therefore, alleviating the negative effects of heat stress would improve poultry welfare and reduce its economic impact. This study investigated the using macrophage (MQ-NCSU) cells as an in vitro model of the innate immune system. Cells were incubated at 40oC (normal incubation temperature) or 44oC in the presence or absence of different Lactobacillus species, including *L. animalis*, *L. crispatus*, *L. reuteri*, and *L. acidophilus*. The supernatants were collected to measure nitric oxide (NO, an indicator of macrophage activation) levels, and RNA was extracted from macrophage cells for gene expression analysis. Our preliminary data show that Lactobacillus species differentially induced NO production in macrophages incubated at 40oC. More importantly, the lactobacilli- treated cells maintained high levels of NO when incubated at 44oC. The expression analysis of the immune-related genes is being performed.

James McKenzie

(Learning) Clinical Reasoning and the Diagnostic Process

Clinical reasoning is a term used to describe the complex cognitive process providers use when evaluating and treating patients. It requires pattern recognition, broad schemas, and building illness scripts to effectively treat the clinical problems proficiently. Clinical reasoning has traditionally been assumed to be embedded into foundational graduate nurse practitioner courses to prepare students to enter the clinical setting. However, this assumption poses a paradoxical problem as students lack the clinical experience as providers that is essential to build proficiency in clinical reasoning. This research sought to explore the theories of clinical reasoning and its interrelated components to gain a clearer understanding of clinical reasoning to potentially improve it in graduate nursing education. Methods include application of case study theories, recognizing schemas, and development of illnesses scripts. This project proposes that synthesizing information gained from these methods can provide an improved standardized framework for clinical reasoning education in nurse practitioner programs.

Akash Shanmugam Boobalan

(Society) Health IT, Clinical Decision Support, and Interoperability

Developing a Common Clinical Decision System Module for Immunization Recommendations

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The adoption of EHR (Electronic Health Record) systems has steadily increased in recent years. According to HealthIT.gov, in 2021, 88% of medical providers utilized some sort of EHR system [1]. Medical providers use various systems in healthcare delivery, and often, these systems do not interoperate. Commonly, these systems contain CDS (Clinical Decision Support) modules to assist physicians in delivering healthcare services. CDS has been proven to be very effective in immunization prescriptions. WHO reported in 2019 that immunization prevents an estimated 4-5 million deaths every year [2]. Many CDS modules are rule-based (e.g., age, health conditions, previous doses); however, the CDS rules are not easily reusable or shareable across institutions. This project aims to design a common CDS module by leveraging machine-readable CDS rules (i.e., CDC-recommended immunization schedules) based on a CDS ontology. The CDS module provides reminders about patients' immunizations and the capacity to manage and maintain rules by end

users. Currently, we use OpenMRS and OpenEMR as test beds to explore the development and implementation details to separate the common CDS module and the individual customized CDS adapter. We aim to maximize the common module and minimize the customized adapter to improve the reusability of the CDS module and CDS rules.

Anna Preter

(Society) Lung Cancer Screening Education and Implementation

Lung cancer is the leading cause of cancer death and the second leading cause of death in the United State (33.4 per 100,000 individuals). Residents of rural areas, particularly minorities, are at greater risk for lung cancer compared to urban counterparts, and these disparities continue to grow over time. In rural communities, lung cancer is more likely to be diagnosed at later stages, with a five-survival rate of only 27%. Current research suggests rural primary care providers (PCPs), ‘gatekeepers of health’, may not be aware of the most recent evidence-based guidelines for lung cancer screening (LCS), leading to delayed identification and intervention. Project GROW strives to improve the uptake of LCS by educating and coaching the PCPs with a specific focus on increasing awareness of poor lung cancer outcomes for minority, underserved rural communities. The program builds collaboration between pulmonary LCS experts and rural PCPs through ongoing conversations and streamlining referral processes. The LCS experts created education modules and coupled them with peer-to-peer encounters with PCPs to strengthen relationships. The modules were assessed with pre- and post-test followed by a 3-month retest to determine ongoing understanding of LCS guidelines. The research team collected data on the incidence of LCS referrals and monitored for increases in the enrollment of minority and underserved individuals over a 6-month period. To date, Project GROW has demonstrated improvements in rural PCPs understanding of the need to complete LCS and initiate the referral process, particularly for those most vulnerable patients in rural communities.

Preter, A., Seobarrat, C., Corbett, W., Lamb, J., Tomashefski, S., Surka, A, Bible, J. & Fasolino, T.

Lu Zhang

(Society) Cancer Epidemiology

Background: Residential segregation is a root cause of health disparities in the US. We examined the association of three most frequently used measurements of residential segregation with mortalities in the US counties.

Methods: We used 2019 American Community Survey data to calculate county-level segregation with three metrics: the Index of Concentration at the Extremes (ICE), the dissimilarity index, and the isolation index. The values for each metric were categorized into quintiles. Age-adjusted all-cause mortality and top 5 causes mortality (2015-2019) was obtained from the National Center for Health Statistics. Multivariable linear mixed models were clustered at state level, weighted by county population size, and adjusted for county-level metropolitan status, poverty, and racial composition. Adjusted risk ratio (ARR) and P value-for-trend (P-trend) were calculated.

Results: We analyzed 3,049 counties with average all-cause mortality of 823.06 per 100,000 persons. Compared to the least segregated quintile, the ARRs for all-cause mortality were 1.20 (95% confidence interval: 1.18-1.23), 1.17 (1.15-1.19), 1.11 (1.09-1.12), and 1.06 (1.05-1.08), respectively for the other 4 quintiles of the ICE (P-trend<0.0001); 0.96 (0.95-0.98), 1.03 (1.01-1.05), 1.03 (1.01-1.04), and 1.03 (1.01-1.05) for the dissimilarity index (P-trend=0.53); 1.05 (1.03-1.08), 1.05 (1.03-1.07), 1.02 (1.00-1.04), and 1.01 (0.99-1.02) for the isolation index (P-trend=0.01). Similar trends were observed for mortality from heart disease, cancer, chronic obstructive pulmonary disease, and strokes.

Conclusions: County-level segregation measured via the ICE is most strongly associated with all-cause mortality and mortality from major chronic diseases, followed by the isolation index. The dissimilarity index was not significantly associated with county-level mortality.

Mytchell Ernst

(Society) Clinical decision support systems, clinical informatics, interoperability How many and how fast can inexperienced clinical researchers generate data-driven hypotheses in two hours?

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RESEARCH SYMPOSIUM

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Scientific hypothesis is critical in determining the direction of research projects, but not much is understood regarding its process. Therefore, the goal of this project was to explore the process by determining the amount and duration of hypotheses generated by inexperienced clinical researchers in two groups, one used VIADS (a visual interactive analytic tool for summarizing and filtering hierarchical data sets) and the other did not use VIADS. A mixed-method experiment was conducted in which study participants analyzed the same datasets while following the same think-aloud protocol. We used independent t-tests to compare the amount and duration of hypotheses generated by both groups. The preliminary results showed that both the VIADS and non-VIADS group generated an average of 12 hypotheses in 2 hours. Additionally, a one-tail independent t-test showed statistically significant results ($P= 0.046$): the mean time to generate each hypothesis in the VIADS group was less than in the non-VIADS group. These findings indicate that study participants could generate hypotheses more efficiently using VIADS. These results can provide a profile for hypothesis generation via inexperienced clinical researchers. However, the current results have not considered the quality of the hypotheses yet.

Alice Franco

(Society) Maternal and Child Wellness, Substance Abuse

Purpose: The rate of Neonatal Opioid Withdrawal Syndrome (NOWS) has rapidly increased in the US. Infants with NOWS often experience severe withdrawal symptoms, including heightened arousal and agitation, leading to difficulty regulating or “self-soothing.” This study measures skin conductance (SC) as a proxy for pain in infants with NOWS.

Methods: Infants with NOWS were categorized into two treatment groups: treatment with methadone to manage withdrawal symptoms (scheduled or as needed) and no pharmacologic treatment. We used the MedStorm Pain Monitor Index device to measure infant stress to calculate skin conductivity levels with the tactile stimulus of wiping the infant’s foot with an alcohol swab for 30 seconds. Rates of skin conductivity were measured ten minutes before and after the stimulation. This study is ongoing until a total of $n=20$ infants is reached.

Results: The study sample was 85% female, 100% White/Non-Hispanic, and 62% received

pharmacotherapy. The average maternal age was 30, and only one received prenatal care; 46% were prescribed methadone MAT, and 78% used nicotine prenatally. While there were no statistically significant differences pre and post-stimulus between study groups, infants who received pharmacotherapy remained in a heightened state of agitation following the stimulus. These findings indicate that infants requiring pharmacotherapy to manage withdrawal are experiencing a heightened pain response than non-medicated infants.

Conclusion: Future studies should examine measures of pain and the ability to self-regulate after experiencing a stressor in infants using various stimuli, which will be critical to improving the quality-of-care delivery for infants with Nows.

Micah Jordan

(Society) Residential Segregation, Social Determinants of health, and Social Epidemiology
Background: Residential segregation is a root cause of health disparities in the US. We examined the association of three popular measurements of residential segregation with mortalities in the US counties.

Methods: We used 2019 American Community Survey data to calculate county-level segregation with three metrics: the Index of Concentration at the Extremes (ICE), dissimilarity index, and isolation index. Age-adjusted all-cause mortality and top 5 causes mortality (2015-2019) was obtained from the National Center for Health Statistics. Multivariable linear mixed models were clustered at state level, weighted by county population size, and adjusted for county-level metropolitan status, poverty, and racial composition. Adjusted risk ratio (ARR) and P value-for-trend (P-trend) were calculated.

Results: We analyzed 3,049 counties. From the most to the least segregated quintile, all-cause mortality was 930.4, 902.1, 824.2, 768.6, 690.2 per 100,000 (P-trend<0.0001) for the 5 quintiles of the ICE. Compared to the least segregated quintile, the ARRs for all-cause mortality were 1.20 (95% confidence interval: 1.18-1.23), 1.17 (1.15-1.19), 1.11 (1.09-1.12), and 1.06 (1.05-1.08), respectively for the other 4 quintiles of the ICE (P-trend<0.0001); 0.96 (0.95-0.98), 1.03 (1.01-1.05), 1.03 (1.01-1.04), and 1.03 (1.01-1.05) for dissimilarity index (P-trend=0.53); 1.05 (1.03-1.08), 1.05 (1.03-1.07), 1.02 (1.00-1.04), and 1.01 (0.99-1.02) for isolation index (P-trend=0.01). A similar trend existed for mortality from heart disease, cancer, chronic obstructive pulmonary disease,

and strokes.

Conclusions: County-level segregation measured via the ICE is most strongly associated with all-cause mortality and mortality from major chronic diseases, followed by isolation index. Dissimilarity index was not significantly associated with county-level mortality.

Emily Doherty

(Society) Perinatal Health and Health Disparities

Introduction: An intersectionality framework recognizes individuals as simultaneously inhabiting multiple intersecting social identities embedded within systems of disadvantage and privilege. Previous research links perceived discrimination with worsened health outcomes yet is limited by a focus on racial discrimination in isolation. We apply an intersectional approach to the study of discrimination, examining the association with adverse perinatal health outcomes.

Methods: Data is from cohort of 2,286 pregnant persons: Black (n=933), Hispanic (n=471), White (n=853) and “Other” (n=29) from the CRADLE trial. Perceived discrimination was assessed via the Everyday Discrimination Scale (EDS) and perinatal health outcomes collected via electronic medical record review. Latent class analysis was utilized to identify subgroups of discrimination based on EDS item response and the rate of adverse perinatal health outcomes compared between subgroups using a Block, Croon and Hagenarrs three-step approach.

Results: Four discrimination subgroups were identified: no discrimination; general discrimination; discrimination attributed to one/several social identities; and discrimination attributed to most/all social identities. Experiencing general discrimination was associated with postpartum depression symptoms when compared to experiencing no discrimination among Black (9% vs. 5, p=0.04) and White participants (18% vs. 9%, p=0.01). White participants experiencing general discrimination gave birth to low birthweight infants at a higher rate than those experiencing no discrimination (6% vs. 11%, p=0.04). No significant subgroup differences were observed among Hispanic participants.

Conclusion: Perceived discrimination may play an influential role in shaping perinatal health. Further research integrating an intersectional lens to the study of discrimination and perinatal health outcomes is needed.

James Paul Gremillion & Alexis Sales

(Society) Determinants of Health, Health Promotion, and Socio-Behavioral Health Sciences

Among South Carolina Community Choices waiver participants, Adult Day Health Care (ADHC) participation has fluctuated over the years and has been directly impacted by the COVID-19 pandemic. A review of ADHC-related literature indicates that Home and Community-Based Services (HCBS) waiver participants and caregivers tend to prefer self-directed, in-home care as opposed to facility-based settings. The ADHC service assessment focuses on ensuring that the service is meeting participants' needs, determining how the service is intended to serve participants, and providing recommendations for improving ADHC. Furthermore, this assessment includes engaging with stakeholders, developing a logic model, and analyzing service and stakeholder data. Analyzing data gathered directly from Community Choices waiver participants on ADHC provided a foundation for the project. This poster shares the results of that analysis including demographic characteristics of ADHC participants, how participants learn about ADHC, reasons for attending ADHC, and satisfaction levels with ADHC. Reviewing these results will be the first step for researchers, waiver administrators, and case managers to develop a logic model of the ADHC service. In addition, stakeholder engagement will include presenting these findings to ADHC providers and gathering feedback from them. On an ongoing basis, additional data on ADHC will be gathered from waiver participants. This data will be used in conjunction with the logic model and stakeholder feedback to ensure the service is meeting participants' and caregivers' needs and provide recommendations for changes if necessary.