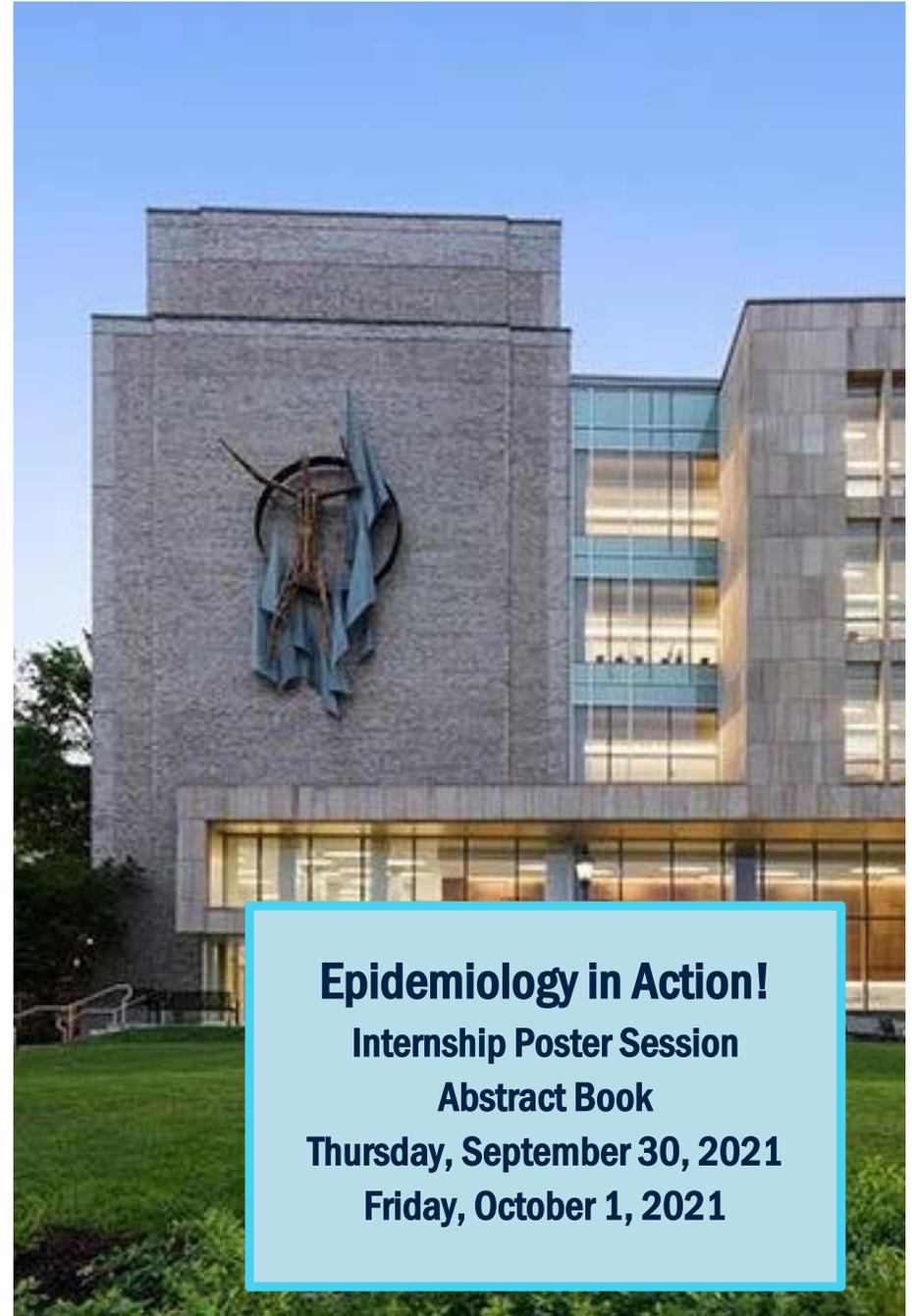


The Department of Epidemiology Internship provides an opportunity for MPH students to apply the knowledge they have acquired in the classroom to professional work situations. Internships usually take place in state, county, federal, or international-level health departments, public health institutes/programs, hospitals, or within the University of Pittsburgh or international research groups.

Students are encouraged to choose an experience that will help them sharpen a skill set as well as explore a new area of research. Students develop their internship placement, goals, and responsibilities in collaboration with the students' faculty advisor and preceptor to individualize and maximize the learning experience.

Special thanks to the Internship Preceptors for fostering these enriching educational opportunities. An exciting result of some of these unique partnerships has been the establishment of new research collaborations.

Enjoy viewing and discussing our students' impressive work! Thank you for joining us!



Notes

Thursday, September 30, 2021

Presenter: Emily Arthur

Agency: Virginia Rural Health Association

Preceptor: Beth O'Connor, MEd

Maternal Health in Rural Virginia

Background/Objective: The Virginia Rural Health Association (VRHA) is a nonprofit organization working for the 2.5 million people who call rural Virginia their home. Through education, advocacy, and fostering cooperative partnerships VRHA improves the health of rural Virginians. Healthcare access is very limited in rural Virginia with obstetrics and gynecology (OB-GYN) services non-existent in many counties forcing women to travel to receive the necessary services. VRHA compiles data on all rural counties and determines which areas have the greatest need of services. From there, VRHA partners with policymakers and stakeholders to provide help to at-risk areas. The practicum experience provided by VRHA included gathering and obtaining data from various sources to produce tables and graphs for grant applications. VRHA would use those grant funding to work with community partners to address maternal health outcomes.

Methods: Searches were conducted that pertained to maternal health indicators such as low birth weight, rural population, teen birth rates, number of hospitals, etc. Data sources included the Rural Health Information Hub, County Health Rankings Database, Virginia Department of Health Database, and the United States Census Data.

Results: From the data that were compiled, the national and state data were compared to seven rural Virginia counties: Essex, King George, Lancaster, Middlesex, Northumberland, Richmond, and Westmoreland. Essex had the highest percentage of low birth weight (14%) compared to the national and state percentage of 8%. Westmoreland had the highest teen birth rate (30%) compared to the national average (16.7%) and the state average (16%). Maternal smoking was the highest in Northumberland (16.7%) compared to the national average (16%) and the state average (5.6%). Lastly, King George, Middlesex, and Westmoreland all had no hospitals within their county while Essex, Lancaster and Northumberland have one. Although, none of these hospitals have OB-GYN services.

Conclusion: Evidence gathered during this practicum showed which rural counties have both limited access to hospital care and a high percentage of maternal health issues.

Presenter: Kristen Steffes

Agency: University of Pittsburgh, Graduate School of Public Health,

Department of Epidemiology

Preceptor: Evelyn Talbott, DrPH, MPH

Risk Factors for Childhood Cancer in Southwestern Pennsylvania: Case-Control Study

Background/Objective: Childhood cancer is the third leading cause of death in U.S. children, yet there are very few known risk factors. The present case-control study is investigating environmental and personal risk factor associations with Acute Lymphoblastic Leukemia (ALL), Non-Hodgkin's Lymphoma (NHL), Central Nervous System (CNS) tumors, and Ewing's/ Bone cancers. The study region includes Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Washington, and Westmoreland counties, plus the surrounding 10-mile buffer region. Personal interview information and residential history will be linked to publicly available environmental exposure databases. My role as a graduate student research assistant was to help facilitate study rollout.

Methods: This study is in the beginning stages of development. I conducted a literature review and investigated the potential adverse health effects (including asthma exacerbations, adverse birth outcomes, and cancer) of natural gas development and production. I assisted with creation of informational brochures, recruitment letters, and the study's website. I also assisted with development and piloting of the questionnaire. The final weeks of my internship were spent acquiring, transforming, and analyzing data from the EPA Toxic Release Inventory for 1990-2019 regarding toxic releases from facilities in the study area.

Results: I evaluated the strengths and limitations of the epidemiologic literature and became more knowledgeable about potential health effects and the process of natural gas development. I gained experience communicating audience-appropriate public health content by assisting with the creation of the study website and informational brochures for participants. Additionally, I had the opportunity to apply knowledge from my courses to assess and analyze epidemiologic databases.

Conclusion: Conducting environmental exposure analyses and working with an interdisciplinary team advanced my interest in studying environmental health. I gained experience assisting with a study from the beginning stages and I have developed an interest to continue pursuing research. I will assist with the present study until the end of the funding window in December 2022. The study is expecting to determine risk factors associated with childhood cancer and hypothesizes that cases relative to controls are more likely to live in close vicinity to environmental exposures of interest after adjustment for other risk factors.

Presenter: Neel Rao

*Agency: University of Pittsburgh, Graduate School of Public Health,
Department of Epidemiology
Preceptor: Bonny Rockette-Wagner, PhD*

ActiveGoals Data Analysis and Maintenance Handout Creation

Background/Objective: A total of 150 minutes/week of moderate to vigorous intensity physical activity is recommended for adults to avoid poor health outcomes. However, most adults do not reach these recommended levels. An online physical activity intervention coordinated with routine clinical care (ActiveGoals) was developed to increase physical activity in adult primary care patients (21-70 years) with low activity levels.

Methods: Data related to satisfaction of the ActiveGoals study (collected via survey 3 months after pre-intervention assessment and within 2 weeks of completing the 13-week program) was analyzed using SAS software. Analysis included formatting/cleaning data and compiling descriptive statistics. Data related to participant demographics and outcomes were examined and compared across important subgroups. I also created handouts for the development of a 12-month maintenance phase of the next iteration of the study, ActiveGoalsv2. In preparation for a future systematic review, we began preliminary searching of articles related to physical activity and complementary/alternative medicine in the treatment of chronic pain.

Results: Overall program satisfaction was good. The results of the satisfaction survey suggested the participants assigned to using a Fitbit versus Omron monitor to track steps were more satisfied with the appearance, convenience, comfort, durability, and ease of use of the Fitbit ($p < .05$). The maintenance materials were based on strength training and mindful movement. Both handouts introduce the topic and are accompanied by an example sheet. The strength training example is a 3-day suggested workout program, and the mindful movement example contains blank forms for participants to track progress.

Conclusion: The observed preference participants have for the Fitbit versus Omron monitor suggests acceptability for use in future interventions. The maintenance materials were created, with plans for us to record video examples of exercises listed in the strength training program. These materials will give participants knowledge and examples on how to increase their activity on their own. The literature searching provided insight into unfamiliar forms of alternative and complementary medicine (acupuncture, cryotherapy) and the rationale behind including exercise with them in treating chronic pain conditions.

Presenter: Deidra Balchak

*Agency: University of Pittsburgh, Graduate School of Public Health, Department of
Epidemiology, Epidemiology Data Center
Preceptor: Marnie Bertolet, PhD*

Implementation of Risk Based Monitoring in SCD-CARRE and a Review of Current Practices

Background/Objective: Risk Based Monitoring (RBM) is the process of the monitoring clinical trial activity based on a set of predetermined hazards that, if missing, threaten the integrity of the trial data. RBM is completed through protocol risk assessment, addressing high impact hazards through set stages of increased monitoring, and centralized monitoring of lower impact hazards. As clinical research trials were traditionally monitoring through 100% source data verification and trial site visits by research monitors, RBM has the potential to streamline the process of clinical trial monitoring while maintaining the data's integrity. The Sickle Cell Disease and Cardiovascular Risk - Red Cell Exchange Trial (SCD-CARRE) team designed and implemented a Risk Based Monitoring Plan (RBMP) to monitor the clinical trial activity. The purpose of this practicum was to review the most current literature on RBM and assess the SCD-CARRE RBMP for possible points of weakness.

Methods: Literature on RBM and studies utilizing RBMPs from approximately the last 10 years were reviewed to understand the purpose and typical RBM practices that are utilized by other clinical research trials. The SCD-CARRE Risk Assessment Tool (RAT) was also reviewed to identify study reports and centralized data checks that addressed the hazards identified by the RAT. A log of these forms was created and gaps in reporting were recognized for further assessment.

Results: Through the review of the RBMP and associated study specific reports, I identified four areas of weakness not otherwise covered by current monitoring efforts. These included tracking clinical site engagement and staff turnover, inconsistent quality of ECHO data, and regular reporting of serious adverse events (SAE) outside of the Data Safety Monitoring Board (DSMB). I proposed an additional quarterly report that summarizes site activities and an ECHO form to help remind clinical staff of critical study data.

Conclusion: Clinical trial monitoring is an important process that protects the quality and integrity of clinical trial data, which can have lasting impacts on medical treatment practices. I learned through this practicum the complexities of clinical trial design, implementation, and monitoring.

Presenter: Anna Christman

Agency: Prevention Point Pittsburgh

Preceptor: Aaron Arnold, MPH

**Prevention Point Pittsburgh:
Syringe Access Statistics Allegheny County, PA 2020**

Background/Objective: Syringe service programs are effective, community-based programs that provide services including needle exchanges, testing, sterile equipment distribution, substance use treatment, education, etc., and serve the public by reducing overdose deaths, accidental sticks, disease circulation, and reduce the number of needles present in the community. Prevention Point Pittsburgh (PPP) has been the sole provider of legal syringe access services for 25 years in Western PA. The objective of my internship project was to analyze data related to syringe distribution and the individuals who utilize PPP's services.

Methods: PPP workers and volunteers asked participants questions and recorded their responses at each of the five PPP sites; Easy Liberty, Perry Hilltop, Hill District, Carrick/Overbrook, and Homewood. These data included measures related to distribution of materials, but also characteristics of participants and the services they sought through the organization. Data analysis and visualization were conducted using Microsoft Excel.

Results: Overall, PPP distributed 1,042,578 Syringes in 2020 during 5,361 interactions with 2,491 unique individuals, 593 of which were participating in syringe services for the first time. In addition, 3,447 individuals received syringes via secondary distribution; individuals who visited PPP to collect syringes then dispensed them to other members of the community. Of the unique individuals who used PPP, 32% of the participants were women, 67% were men, and <.5% were transgender. Racial breakdown was as follows: 52% of the participants were White, 47% Black, .6% Latinx, <.1% were Asian, and .5% were categorized as other. The age distribution of unique participants: 1% of participants were between the ages of 18-24, 17% 25-34 years, 25% 35-44 years, 19% 45-54 years, 25% f 55-64 years, and 13% were 65+. From 2019 to 2020, PPP experienced a 57% increase in number of syringes distributed and a 111% increase in the number of unique individuals using their services.

Conclusion: PPP continues to prove its importance as a valuable asset for many individuals in Allegheny County. The ongoing trends of increase in both distribution, as well as number of participants, are proof that the ACHD should continue to provide their support to this organization as a vital healthcare resource.

Presenter: Nathan Raabe

*Agency: University of Pittsburgh, School of Medicine, Department of Medicine,
Division of Infectious Diseases*

Preceptor: Minh-Hong Nguyen, MD

**Using Echinocandin (ECH) MICs and FKS Sequencing to Study the Emergence
of Echinocandin Resistance Among *Candida glabrata* Clinical Isolates
Over a Ten-year Period**

Background/Objective: Invasive *Candida* infections (invasive candidiasis, IC) are responsible for significant morbidity and mortality, especially immunocompromised populations. Echinocandins (caspofungin, micafungin, anidulafungin) are gold standard treatment for IC. Echinocandins inhibit fungal glucan synthase (encoded by FKS) which is required for cell wall synthesis. Echinocandin-resistance among *C. glabrata* (CG) is emerging due to FKS mutations. The overall goals of this project are to assess rates of ECH resistance over time among *C. glabrata* clinical isolates and establish the association between caspofungin, anidulafungin, and micafungin MICs with mutations of FKS genes.

Methods: Assessed echinocandin-resistance among CG clinical isolates over 10 years (2011-2020) using clinical breakpoints (CBPs) and fks gene Sanger sequencing.

Results: Of the 516 CG isolates, the median and range MIC of caspofungin, anidulafungin and micafungin were 0.06 (0.006-8), 0.03 (0.006-4) and 0.015 (0.008-8) µg/mL, respectively. Based on CBPs, 3.7%, 2.2%, and 2.5% were resistant to caspofungin, anidulafungin and micafungin, respectively. 1.6% were resistant and 94.5% were susceptible to all 3 agents. The rate of discrepancy was 2.4% between caspofungin and anidulafungin, 3.5% between caspofungin and micafungin, and 1.5% between anidulafungin and micafungin. There was no significant difference in echinocandin MICs between the blood and extra-blood site isolates (p=0.22). Over the 10-year period, there was a trend toward decreasing micafungin and anidulafungin MICs (p=0.02 and 0.06, respectively). The rates of resistance of anidulafungin and micafungin was higher between 2013-2016 (4.2% and 3.7%) than between 2017-2020 (3.7% vs 1%, respectively; p=0.05 and 0.09, respectively). To date, we have sequenced 12 isolates NSS to >=1 echinocandins; both isolates resistant to all 3 echinocandins harbored FKS1 mutation; 1/10 with only caspofungin non-susceptibility harbored FKS2 mutation.

Conclusion: The trend of echinocandin resistance is down over the past 4 years, likely reflecting antibiotic stewardship effort to reduce prolonged use of echinocandin at our center. FKS sequencing might prove to be more sensitive and specific than echinocandin MICs.

Presenter: Yachana Panchal

Agency: UPMC Western Psychiatric Hospital

Preceptor: Janina-Marie Tatar, CIC, MBA, MT (ASCP)

COVID-19 Vaccine Hesitancy Among Schizophrenia Patients

Background/Objective: Schizophrenia patients at the UPMC Western Psychiatric Hospital Comprehensive Recovery Services outpatient clinic receive Clozapine or other long-acting injectables. Clozapine, an antipsychotic, is associated with increased susceptibility to infections like pneumonia, making them a high-risk group for COVID-19. Thus, it is important to ensure vaccination, however, there is a lot of distrust and accessibility issues regarding vaccination. The purpose of this internship was to determine the vaccination rate in the clinic and create a survey to assess reasons for vaccine hesitancy.

Methods: I gathered data about vaccination rate by using PA-SIIS and their UPMC charts to determine whether patients had their COVID-19 vaccine. Additionally, I sat in on patient appointments to ask patients about 1) their vaccination status; and 2) if they were unvaccinated, their reasons for not getting vaccinated.

Results: I found that approximately 1/3 of the 706 patients in the CRS outpatient clinic were unvaccinated. I created a survey with 7 questions asking about attitudes and opinions about COVID-19 vaccination. The goal of the survey is to categorize patients: problems with 1) confidence, 2) complacency, or 3) convenience. Survey questions include yes/no, Likert scale, and multiple-choice responses. The survey will be handed out at patient appointments to unvaccinated patients. Data collection will be conducted from end of September to end of October 2021. Approximately 50 patients will be asked to participate.

Conclusion: The survey will be able to assess what categories unvaccinated patients fall into. This will allow for targeted education and intervention to help increase COVID-19 vaccination rates in this population.

Presenter: Isabel Damazo

Agency: Allegheny County Health Department, Pittsburgh Summer Institute

Preceptor: Kristen Mertz, MD, MPH

Allegheny County Animal Bite Report, 2020

Background/Objective: Animal bites present a public health issue of concern due to the potential for injury and infection, such as rabies. Rabies is fatal once symptoms begin, but the onset of symptoms can be prevented through the administration of vaccines and immunoglobulin after exposure, known as post-exposure prophylaxis (PEP). Animal bites must be reported to the Allegheny County Health Department by healthcare providers and other first responders, and ACHD staff investigate bite reports and advise victims regarding PEP. The bite data from 2020 were analyzed and compiled into a report.

Methods: Bite report data were pulled from the Oracle database and analyzed using SAS v. 9.4 and Microsoft Excel. Data visualizations were produced in Excel. Data from 2013 through 2020 were used to analyze trends in bite reports over the eight-year timeframe.

Results: There were 2,252 animal bites reported in Allegheny County in 2020. Most of the reported bites (74.8%) were from dogs or cats (19.2%). The two most common wild animal exposures were from bats (0.9%) and raccoons (0.5%). In general, bites to females were reported at a higher rate than bites to males, with the exception of bites reported for children <15 years and older adults >80 years. No dog rabies cases were reported in the county. Fifty-five bite victims completed rabies PEP in 2020; of those, 29 (45.5%) did not have a valid reason for completing PEP, such as being exposed to a rabid animal or an animal that could not be tested or observed. One individual was exposed to an animal that tested positive for rabies. No human cases of rabies were reported in the county. The number of reported animal bites has increased by 27% from 2013 to 2020.

Conclusion: The number of reported animal bites reached a new high in 2020 compared to previous years despite the onset of the COVID-19 pandemic. Pets were responsible for the majority of reported bites in 2020. Animal bite case investigation should be continued and guidelines should be followed by the ACHD and healthcare providers when recommended completion of PEP.

Presenter: Wesley DeHaven

*Agency: University of Pittsburgh, Graduate School of Public Health,
Department of Epidemiology
Preceptor: Andrea Rosso PhD, MPH*

Association of Air Pollution with Neurodegeneration Biomarkers

Background/Objective: Previous research has demonstrated associations between air pollution and brain health. Studies indicate that a greater exposure to air pollution is associated with poorer cognitive function and with an increased risk of Alzheimer's disease and related dementias (ADRD). ADRD have an association with the presence of blood-based biomarkers of neurodegeneration. An association between air pollution and blood-based biomarkers of neurodegeneration is unclear. The objective of this internship was to gain a better understanding of the association between air pollution and blood-based biomarkers. Other activities will include writing a literature review paper and conducting data analyses to answer our research question using an existing data set from the Cardiovascular Health Study (CHS).

Methods: Data being used from this study will come from the Cardiovascular Health Study (CHS), a population-based longitudinal study of risk factors for CHD and stroke in adults 65 or older. Descriptive analyses will include comparing each covariate and air pollution measure with the biomarker, as well as fitting separate linear regression models to understand the association between covariates and air pollutants and blood-based biomarkers.

Results: To date, I have prepared a study proposal for approval and to acquire the data from CHS. I have conducted a literature review for background information and completed the IRB for the study. Once data is acquired from CHS, data analyses will be run and provide information towards answering my research question. In addition, I will be presenting my research protocol to colleagues at John Hopkins who are doing similar work.

Conclusion: Throughout this internship, I was able to gain a better understanding of the effort it takes to contribute to an epidemiological study, and to publish a paper. From conducting my lit review, I am able to hypothesize an association between air pollution and blood-based biomarkers of neurodegeneration, based on the current literature on ADRD, biomarkers, and air pollution. The most important takeaway/lesson learned from this internship is that research takes time, and answers to our hypothesis are not easy to obtain.

Presenter: Rae Oanesa

*Agency: University of Pittsburgh, Department of Emergency Medicine
Preceptor: Alexandra Weissman, MD*

Evidence for Validated Sepsis Screening Tools in the Prehospital Setting: A Scoping Review

Background/Objective: The Society of Critical Care Medicine (SCCM) defines sepsis as a "life-threatening organ dysfunction due to a dysregulated host response to infection." Early detection and treatment of sepsis improves survival. However, within the inpatient setting, detection and identification of sepsis can be elusive and delayed resulting in worse outcomes. The struggle to identify sepsis extends to the prehospital setting, where clinical resources are even more limited and early detection can be of great clinical use. Early Warning System (EWS) scores can be utilized in the prehospital setting to help identify sepsis and predict the degree of severity. The purpose of my internship was to perform a scoping review to evaluate the existing evidence for use of validated sepsis screening scores to identify prehospital sepsis.

Methods: We performed a systematic search of the PubMed, EMBASE, OVID, and CINAHL databases from January 1990 to April 2021. Three sets of keywords were used to identify relevant source titles. Two reviewers independently screened all potentially relevant titles and abstracts for eligibility. Data describing study characteristics, EWS scores used to identify sepsis, and their classification statistics were extracted.

Results: Sixteen studies were included and assessed. Nine studies compared EWS scores against each other, three studies compared EWS scores with an in-hospital diagnosis of sepsis, three were validation studies, and one study was a systematic review of other EWS scores to determine whether they improved sepsis recognition. Sensitivities varied by the EWS scores under review, with results as high as 94% and as low as 7%.

Conclusion: All scoring systems generally performed poorly in identifying sepsis in the prehospital setting. EWS scores were originally developed to predict mortality, and it is reasonable to assume that they would not be realistically useful in the field, especially for a disease as heterogeneous as sepsis. Future studies should shift the focus to protocolization of provider care, early identification of clinical instability, and early execution of stabilizing measures.

Presenter: Reagan Moffit

*Agency: Datalys Center Sports Injury Research and Prevention, Indianapolis IN
Preceptor: Avinash Chandran, PhD*

Datalys Center- Data Management and Dissemination of Sport Injury Epidemiology for NCAA Injury Surveillance System and High School RIOTM

Background/Objective: The Datalys Center for Sport injury Research and Prevention manages multiple longitudinal sport injury surveillance systems, including the National Collegiate Athletic Association Injury Surveillance System (NCAA ISP) and High School Reporting Information Online (HS RIOTM). The objectives of the internship were to synthesize and disseminate a graphical abstract summarizing key findings from descriptive epidemiological studies of injuries in 23 NCAA sports (2014-15 to 2018-19) and to assist with annual system testing, data collection, and data quality review for the NCAA ISP and HS RIOTM.

Methods: First, NCAA ISP data published in the July 2021 Journal of Athletic Training (JAT) Special Issue were synthesized into a single visual abstract. The abstract summarized findings from 23 sport-specific manuscripts published within the issue. Next, 2020-21 season competition dates were compiled into Excel documents for non-spotlight sports for each reporting NCAA institution by using a Google search to view season schedules. Annual HS RIOTM systems testing were conducted to identify any errors when reporting and outputting data. High school 2020-21 enrollment data was compiled into an Excel document for 50 US states and Washington D.C. by using a Google search. Data collected included total and stratified (<1,000 vs >= 1,000 students) number of high schools in each state.

Results: The visual abstract highlighting key findings published in the NCAA July 2021 JAT Special Issue was disseminated in the form of an animated GIF on Twitter. It had a total of 4,626 impressions, 443 media views, and 129 engagements. HS RIOTM system testing was conducted, with a few reporting errors discovered. Additionally, a procedure manual was created to streamline future annual systems testing. Finally, 2020-21 season competition and high school enrollment data were collected and compiled into separate Excel documents.

Conclusion: Ongoing sport injury surveillance is necessary to understand injury trends as well as to guide sport governing bodies to provide a safe environment for athletes. Multiple annual maintenance tasks are needed to 1) ensure reporting platforms and processes are accurately collecting data, 2) gather information needed to create national weights, and 3) ensure the integrity of data collected by conducting quality reviews.

Presenter: Fiona Galley

*Agency: United Steelworkers Tony Mazzocchi Center
Preceptor: Diane Stein*

Impact of the COVID-19 Pandemic on Occupational Training Abilities: An Exploratory Study

Background/Objective: Training on hazard and accident prevention in the workplace is an essential part of maintaining worker health and safety. There is currently limited knowledge on the extent to which occupational health and safety trainings have been affected by the COVID-19 pandemic. The objective of this project was to understand how the COVID-19 pandemic has affected the training abilities of the United Steelworkers (USW) Tony Mazzocchi Center (TMC) and other National Institute of Environmental Health Sciences (NIEHS) training partners.

Methods: A mixed methods approach was utilized to collect and analyze data. A cross-sectional descriptive study consisting of an online survey was used to obtain quantitative data. Online surveys were distributed to gather information from training participants on how occupational health and safety trainings have been affected by the COVID-19 pandemic. Survey data were analyzed through descriptive and inferential statistics including measures of frequency and Chi-square tests. Telephone interviews were conducted among six participants to obtain in-depth qualitative data. Key themes were identified from interview transcriptions.

Results: Over two weeks, 118 survey responses were received. Approximately 49% of survey respondents reported that due to the COVID-19 pandemic, they have not received the training to safely perform their job tasks. In addition, 72.9% of participants indicated that most trainings were cancelled or postponed. Almost 80% of respondents identified that trainings were moved to online platforms during the COVID-19 pandemic. Qualitative interviews revealed that in-person training is the preferred training format. Further, participants reported that the quality and effectiveness of health and safety trainings have declined from before the COVID-19 pandemic to during the COVID-19 pandemic.

Conclusion: Understanding how the COVID-19 pandemic has affected the training abilities of the USW TMC and other NIEHS training partners is essential to advancing occupational health and safety. Findings from this project suggest that there are current gaps in occupational health and safety trainings due to the COVID-19 pandemic. Results from this study will be used to develop questions that guide hypothesis generation for the development of future studies.

Presenter: Zack Hubbard

Agency: U.S. Food and Drug Administration

Preceptors: Kimberly Kontson, PhD and Ellenor Brown, PhD

Comparison of Angular Metrics Between Bypass and Myoelectric Upper Limb Prosthesis Users

Background/Objective: A myoelectric prosthesis is an electronic prosthesis controlled by upper limb muscle activation. Prosthesis research commonly uses bypass prostheses, or modified prostheses that enable non-amputees to operate prostheses like amputees. While past research has shown the time to complete certain tasks is similar between myoelectric bypass and prosthesis users, few studies have directly compared movement characteristics of these two groups. During my internship, I compared angular data collected from a study of both bypass and prosthesis users to examine the differences in movements.

Methods: Eight myoelectric prosthesis users with below-elbow amputations and seven able-bodied bypass prosthesis users completed three tasks meant to replicate activities of daily living (i.e., simulated feeding, pouring water, and turning a doorknob). A Vicon motion analysis system was used to detect changes in joint angles of the elbow (degree of freedom: flexion/extension), shoulder (flexion/extension, adduction/abduction), torso (flexion/extension, lateral flexion) and neck (flexion/extension, lateral flexion). Motion capture data was used to calculate eight different features of movement for each joint/degree of freedom meant to characterize movement smoothness, efficiency, and extent. These metrics included peak angle, mean angle, standard deviation of the mean angle, range of motion, angle pathlength, peak velocity, mean velocity, and zero-crossings of velocity. Differences between bypass and prosthesis users were analyzed in SAS using linear mixed models for each metric at each joint/degree of freedom using an alpha level of $p < 0.05$ and correcting for multiple comparisons.

Results: When corrected for multiple comparisons, there were no differences detected between bypass and prosthesis users in range of motion, standard deviation of the mean angle, and peak velocity. Bypass users were found to have greater mean and peak angles for head flexion/extension and higher angle pathlength and mean velocity in shoulder adduction/abduction and elbow flexion/extension. Zero-crossings were greater in prosthesis users at each region except torso lateral flexion.

Conclusion: Using bypass prosthesis users as proxies may not be generalizable to amputees when using mean and peak angles of head flexion/extension and angle pathlength or mean velocity for shoulder adduction/abduction or elbow flexion/extension. Comparison of zero-crossings should be avoided at each region of the body.

Presenter: Sierra Lookabill

Agency: Marshall University Joan C Edwards School of Medicine, Division of Community Health in the Department of Community & Family Health

Preceptor: Deb Koester, PhD, DNP, MSN, RN

Supporting the Appalachian Diabetes Coalition Network Across Eight States

Background/Objective: The Appalachian Diabetes Control and Translation Project began in 2001, developing coalitions for type 2 diabetes control and prevention in rural Appalachian communities classified as “at risk” or “distressed.” A 2010 study found that residents of these distressed counties were 1.4 times more likely to have diabetes than non-Appalachian county residents. Currently, the Center for Rural Health at Marshall University serves over 60 active coalitions of the Appalachian Diabetes Network (ADN) with support from CDC’s Division of Diabetes Translation. The purpose of this internship was to support the chronic disease team who serve the ADN coalitions through 1) designing monthly newsletters; 2) performing social media outreach; and 3) planning and coordinating monthly technical assistance office hours for the coalitions.

Methods: The chronic disease team coordinates the community-based diabetes and healthy living coalitions across eight Appalachian states. This team provides technical assistance and training to these coalitions. Part of this support includes monthly newsletters, social media outreach, and hosting a monthly “Virtual Office Hours.” The monthly newsletters provide important updates, training resources, and success stories from the coalitions. The office hours are designed to help coalitions learn about topics and programs that may be useful in their communities.

Results: I created monthly newsletters that were distributed to the coalitions that included updates on relevant training webinars and resources for healthy living interventions. In addition, I coordinated and planned their June, July, August, and September Virtual Office Hours. The topics of these events included brain health and aging, container gardening, and resources for applying for funding for their coalition.

Conclusion: My work with the chronic disease team is ongoing, as well as their technical assistance for the coalitions. The coalition leaders seemed interested in the topics presented through the monthly Virtual Office Hours and requested to have more sessions related to marketing their community programming specifically to rural and elderly populations. Along with the monthly Virtual Office Hours and newsletters, I will be conducting focus groups with some of the coalition leaders to discuss community engagement throughout the COVID-19 pandemic.

Presenter: Rheana Lipscomb

Agency: Allegheny County Health Department, Pittsburgh Summer Institute

Preceptors: Jennifer Fiddner, MPH, CIC and Josh Feldmiller, MPH

Classification of COVID-19 Related Deaths in Allegheny County

Background/Objective: COVID-19 was the third leading cause of mortality among U.S. residents in 2020, but the accuracy of the death count has been questioned. My project sought to identify, among the deaths originally attributed to COVID-19 by the Allegheny County Health Department (ACHD), how many deaths included COVID-19 on the death certificate. My secondary aim was to identify additional COVID-19 related deaths not initially included in the ACHD's COVID-19 mortality total.

Methods: COVID-19 case data provided by the ACHD were matched with preliminary vital statistics data provided by the Pennsylvania Department of Health from March 1, 2020, to February 19, 2021. Deaths were included in the analysis if they had ICD-10 codes for the contributing causes of death on the death certificate. The match was used to identify cases for which the death variable was incorrectly documented as no or unknown and identify COVID-19 related deaths among vital statistics records that were not in the case data.

Results: Among 1,404 deaths in Allegheny County originally determined to be COVID-19-related in the case dataset, 94% included COVID-19 on the death certificate. Among the cases with the death variable incorrectly documented, 16 COVID-19 deaths were identified. A total of 121 additional COVID-19-related deaths not identified in the case dataset were identified from death certificates and will be reviewed by ACHD.

Conclusion: Public health agencies such as ACHD have had the arduous task of responding to the COVID-19 pandemic while simultaneously tracking its impact on the community. The results of this project highlight that the methods employed by ACHD were largely effective at accurately identifying COVID-19 deaths. Some additional COVID-19 related deaths may not have been counted for several reasons, including individuals not getting tested for COVID-19.

Presenter: Niva Joshi

*Agency: University of Pittsburgh, Graduate School of Public Health,
Department of Epidemiology*

Preceptor: Lisa Bodnar, PhD, MPH, RD

Effects of Omega-3 Fatty Acid Supplementation During Pregnancy on Preterm Birth

Background / Objective: Preterm birth is one of the major risk factors for increased mortality and morbidity in children under the age of 5 years. The true causal association cannot be determined in the presence of time-varying confounding such as side effects. I aim to summarize the evidence of randomized trials of omega-3 supplementation on preterm birth risk and determine the degree to which compliance and side effects were evaluated.

Methods: I searched articles on PUBMED and Cochrane Database of Systematic Reviews for literature review. We used a dataset from a randomized double-blinded placebo-controlled trial conducted by the Maternal-Fetal Medicine Units Network. 852 participants from 14 centers with a history of preterm births were randomized between 16 to 216 weeks of gestation to receive 2000 mg of omega-3 supplement each day (1200 mg eicosapentaenoic acid and 800 mg docosahexaenoic acid) or a placebo (mineral and wheat germ oil) until 36 weeks of gestation or delivery. Both groups received weekly injections of 17-hydroxyprogesterone. We used STATA 16.0 for descriptive analysis and compared time-varying monthly covariates, drug compliance, and study outcomes among the two groups.

Results: From the literature review, there are mixed outcomes for preterm births with limited data on compliance and side effects of Omega-3. The most common side effects of Omega-3 supplementations were belching, burping, and unpleasant taste. Most of the participants were white (49%) and high school educated (47%) which did not differ by treatment. At any point during a study period, the side effects were 73% in treatment and 64% in placebo. The average pill compliance was 83% in treatment and 82% in placebo. Preterm births occurred in 38% of pregnancies in treatment and 42% in the placebo group.

Conclusion: The literature review suggested mixed results on the association between omega-3 supplementation and the risk of preterm birth. The compliance for the study drug was similar between the two groups whereas side effects were more common in the treatment group. Our data suggest that more work should be done to determine the time-varying impact of omega-3 on causal effects of omega-3 and the risk of preterm birth.

Presenter: Charlie Mead

*Agency: University of Pittsburgh, Graduate School of Public Health,
Department of Epidemiology
Preceptor: Tina Costacou, PhD*

Enhanced Macrophage Cholesterol Efflux Capacity in Middle-aged Adults with Childhood-onset Type 1 Diabetes

Background/Objective: Individuals with type 1 diabetes (T1D) exhibit higher rates of coronary artery disease (CAD) compared with the general population, despite generally normal lipid levels and higher concentrations of the cardioprotective HDL-C, thus we hypothesized that HDL may not be a good indicator of HDL function. My internship project assessed differences in novel markers of HDL particle concentration (HDL-P) and macrophage cholesterol efflux capacity (CEC) between middle-aged adults with childhood-onset T1D and controls with normal glucose tolerance (NGT) of similar distribution.

Methods: HDL-P and CEC were determined among 187 individuals with T1D (mean age 51 years, T1D duration 43 years, 52% women) and 200 controls of similar age and sex distribution. As a larger number of those with T1D (n=44) had CAD compared to controls (n=4), analyses were restricted to individuals free of CAD to assure more comparable groups. HDL-P and macrophage CEC were quantified by calibrated ion mobility analysis and a validated cell-based assay, respectively. Descriptive analyses were conducted to assess differences by sex and T1D status, as well as the relationships of the novel HDL markers. Separate multivariable linear regression models were constructed for each novel HDL marker to evaluate whether T1D status was an independent correlate. The presence of effect modification by sex was also assessed.

Results: Individuals with T1D and women (regardless T1D status) exhibited favorable traditional lipid profiles. Significant sex differences (regardless T1D status) were also detected in total HDL-P (higher in women) and the four major HDL subpopulations – extra-small (higher in men), small (higher in men), medium (higher in women), and large (higher in women), although concentrations were similar by T1D status. Total macrophage CEC was higher in those with T1D (all $p < 0.01$). T1D was associated with a 1.06 $\mu\text{mol/L}$ lower M-HDL-P concentrations but 0.52 $\mu\text{mol/L}$ higher L-HDL-P concentrations and 0.26% higher total macrophage CEC compared to NGT ($p < 0.01$), after sex and HDL-C adjustment. Sex did not modify these associations.

Conclusion: In this case-control study of middle-aged adults free of CAD, individuals with childhood-onset T1D had lower concentrations of M-HDL-P but higher levels of L-HDL-P and total macrophage CEC. Further research is needed to understand these findings.

Presenter: Calli Laskowski

*Agency: Allegheny County Health Department
Preceptor: Rachael Bieltz, MPH, CHES, LCCE*

Hepatitis C Among Women of Reproductive Age: Insight Gained Through Interview

Background/Objective: Hepatitis C, a liver condition caused by bloodborne hepatitis C virus (HCV), can cause permanent liver damage. According to CDC, most new cases are associated with injection drug use (IDU). Hepatitis C is concerning among women of reproductive age (WRA), who can transmit HCV to their unborn children. My internship aim was to gain knowledge about HCV in this population to determine optimal prevention efforts and provide cases with resources.

Methods: Interviews were attempted for women aged 15-44 who had a reactive HCV antibody test, or a positive HCV PCR test reported to Allegheny County Health Department (through notifiable disease requirements) between January 1, 2020, and July 31, 2021. Interview questions pertained to pregnancy, recent delivery, demographics, risk factors, and HCV care/treatment. Responses were entered in Pennsylvania's electronic disease reporting system (PA-NEDSS). If healthcare providers were unavailable, we attempted to interview cases. Cases reached were offered resources about HCV care/treatment for them and their children.

Results: Of 301 cases eligible, 172 interviews were completed (mean age of cases: 32.5 years; range: 19 to 44 years). Nearly half (49%) were completed with information from a healthcare provider, 34% with information from a case, and 17% with information from both. Of completed interviews, 80% were for white women, 9% black, 2% of other races (American Indian, Asian, Pacific Islander, or other), and 9% of unknown race. Regarding ethnicity, 2% of interviews completed were for Hispanic women, 52% non-Hispanic, and 45% of unknown ethnicity. One quarter (24%) of interviews did not have/disclose any HCV risk factors. Over half (53%) of interviews disclosed IDU. Interviews regarding white cases were 7.4 times more likely than interviews regarding black cases to report IDU. HCV-related care was reported by 42% of cases, with treatment initiated by 33%. Follow-up letters were sent to 31% of cases. Pregnant women or those who had recently delivered represented 20% of interviews. For 33 children of cases, ACHD will notify pediatricians/parents of recommended HCV testing at 18 months.

Conclusion: Consistent with national HCV data, the majority of WRA with hepatitis C in this survey had a history of IDU. Only about one third initiated treatment.

Presenter: Nidhi Iyanna

Agency: University of Cincinnati and The Health Collaborative

Preceptor: Laura Nabors, PhD

Community Health Needs Assessment in the Greater Cincinnati Region: Ideas to Improve Access and Quality of Care for Youth and Families

Background/Objective: Although Greater Cincinnati has world-class healthcare resources, this region's health outcomes highlight severe inequities. Social determinants of health (SDOH) greatly impact health; hence, there is a tremendous need to inform healthcare providers and policy makers about the impact of these community factors. This needs assessment will provide information regarding socioeconomic, environmental, and clinical barriers, specifically looking at disparities holding back youth and families. This project aims to present a holistic picture of the health in this region, finalizing in a report that will be available for hospitals, health departments, and community-based organizations to reduce inequities and improve quality of care.

Methods: This needs assessment was comprised of five components. First, a literature review on adolescent health was conducted to gather background for the development of qualitative methods. Second, data from the National Survey of Children's Health (NSCH) was reviewed to identify health issues and disparities in Ohio. Third, key informants were interviewed to investigate systemic barriers in their field of expertise. Fourth, focus groups were conducted with youth and family members regarding their experiences with the healthcare system. Finally, dissemination of the results occurred through the creation of appropriate communication materials for the community.

Results: The literature review indicated that increasing access to care, meeting mental health needs, and improving quality of care promotes health and resilience. Data from the NSCH found that oral care, mental health, and adolescent needs were severely lacking in this region. Through 14 key informant interviews, participants representing various medical, dental, school, and community agencies provided expert opinions. Furthermore, 12 focus groups were held with a total of 55 participants representing 10 counties. 7 areas of high feasibility for improvement were identified: provide transportation services, reinforce provider-patient relationships, expand health insurance, educate about transitional care, strengthen telehealth services, increase access to care, and focus on holistic health.

Conclusion: Even though SDOH strongly influence health outcomes, providers and policymakers largely focus on clinical solutions. This community needs assessments provides consumer insight on key areas for improvement that will reduce health disparities and improve the quality of health services for youth and families in Greater Cincinnati.

Presenter: Teja Pulavarthi

*Agency: University of Pittsburgh, School of Medicine, Department of Pediatrics,
Division of Adolescent and Young Adult Medicine*

Preceptor: Elizabeth Miller, MD, PhD, FSAHM

Asset Mapping Supports the Initiatives of a Community-Based Youth Violence Prevention Program

Background/Objective: Creating Peace is a neighborhood-based youth violence prevention program that uses the topics of race, age, sexual identity, gender to teach how to heal trauma, build relationships, and reduce violence. In order to support the goals of the program, I integrated asset mapping, a method that identifies community strengths, in the neighborhoods we work with, specifically Homestead. The asset mapping method is able to provide resources to our youth, recruit community leaders as facilitators, and identify accessible host sites.

Methods: The community-engaged asset mapping method was used to interview our connections in Homestead. The community leaders were asked questions about the resources and locations safe for our youth, positive aspects of their neighborhood, and recommendations for facilitators. The new contacts were then interviewed and mapped according to their key benefits. Potential partnerships between our program and resources and between resources were formulated and follow-up meetings were planned.

Results: Throughout the interview process, I developed a protocol paper and interview guide in order to expand asset mapping to 6 other neighborhoods. The protocol paper is in preparation to be submitted to the Progress in Community Health Partnerships (PCHP) Journal. We have reached out to 25 resources in the Homestead area, including the Best of the Batch Foundation, Steel Valley Family Center, Homestead Library, and Salvation Army of Homestead, and are working to develop community initiatives.

Conclusion: The community members that I reached out to were eager to support the initiative and provide connections to further develop a network that supports the program goals. School officials and research faculty are willing to work together on implementing Creating Peace as an after-school program and hosting future sessions. Fellow members on the team have been able to successfully create their own networks in Knoxville, Clairton, Northview Heights, and Penn Hills. Asset mapping has furthered the relationships within the community and has shown the impact of community empowerment.

Presenter: McClaren Rodriguez

*Agency: Cancer Prevention and Control Research Training Program,
University of Puerto Rico Comprehensive Cancer Center
Preceptor: Cynthia Pérez, PhD*

Influence of Health Beliefs on COVID-19 Vaccination among Patients with Cancer and Other Comorbidities in Puerto Rico

Background/Objective: Ethnic minority populations are more likely to suffer from chronic comorbidities, making them more susceptible to the poor health outcomes associated with COVID-19 infection. Therefore, ensuring COVID-19 vaccination among vulnerable populations, such as cancer patients, is of utmost importance. This summer, I participated in the Cancer Prevention and Control Research Training Program (CAPAC). The aim of my project was to investigate health behaviors and perceptions of COVID-19 vaccination among adults with cancer and other chronic comorbidities in Puerto Rico (PR).

Methods: This secondary analysis used data from 1,911 participants who completed an online survey from December 2020 to February 2021. The Health Belief Model (HBM) was used to measure perceptions surrounding COVID-19 vaccination among individuals diagnosed with cancer, adults with other chronic comorbidities, and healthy adults. Multivariate logistic regression analyses assessed the associations of disease status (healthy, cancer diagnosis, other chronic conditions/comorbidities [excluding cancer]) with individual HBM constructs and vaccine intent, while adjusting for age, sex, education, income, employment status, influenza vaccine, health literacy, and religiosity.

Results: Among study participants, 76% were female, 34% were 50 years or older, 5% had a cancer diagnosis, and 70% had other chronic comorbidities. After adjusting for covariates, participants with a cancer diagnosis had two times higher odds of getting vaccinated than healthy individuals (OR: 2.08, 95% CI: 1.00-4.30). Compared to healthy participants, those diagnosed with cancer and those with other chronic conditions other than cancer had higher odds of perceiving their chance of getting COVID-19 as high (OR: 1.63, 95% CI: 1.01-1.62; OR: 1.39, 95% CI: 1.11-1.73), believed getting COVID-19 was a possibility for them (OR: 1.94, 95% CI: 1.16-3.25; OR: 1.56, 95% CI: 1.24-1.97), perceived they would get very sick if infected with COVID-19 (OR: 4.18, 95% CI: 2.30-7.58; OR: 1.83, 95% CI: 1.47-2.28), and were afraid of COVID-19 (OR: 2.51, 95% CI: 1.18-5.35; OR: 1.67, 95% CI: 1.25-2.22) after adjusting for covariates.

Conclusion: Our findings elucidate the effect of disease status on health-related decision-making and isolate what steps can be taken to increase vaccine uptake among ethnic minority populations.

Presenter: Lauren Gibbs

*Agency: University of Pittsburgh, Graduate School of Public Health,
Department of Epidemiology, Ultrasound Research Laboratory
Preceptor: Emma Barinas-Mitchell, PhD*

Understanding the Association between Ideal Cardiovascular Health Metrics (American Heart Association's Life Simple 7) and Subclinical Carotid Atherosclerosis in Midlife Women

Background/Objective: Carotid plaques are indicators of atherosclerosis and, depending on their stability, size and components, can lead to adverse cardiovascular disease (CVD) events, including strokes. There is insufficient research on how lifestyle factors impact the development and characteristics of carotid plaque in midlife women. The purpose of this internship was to: (1) develop a greater understanding of non-invasive subclinical CVD measures such as carotid ultrasounds (2) learn how to read carotid ultrasound scans to assess plaque size and characteristics and (3) create a codebook of MsHeart study data to investigate the association between cardiovascular health factors and behaviors (American Heart Association's Life Simple 7) and carotid plaque characteristics in midlife women.

Methods: I completed my internship at the University of Pittsburgh's Ultrasound Research Laboratory (URL). At the URL, I worked with an interprofessional team of Epidemiology professors, PHD students/graduates, researchers, and sonographers, to develop a baseline knowledge of on-going research focusing on carotid plaques and lifestyle factors. Working with sonographers from the URL, I was trained to read carotid ultrasounds. Additionally, I reviewed current literature on both carotid plaques and AHA's Life Simple 7 to develop my codebook and further my knowledge of cardiovascular risk factors that impact the development and progression of carotid plaque lesions.

Results: I volunteered with sonographers at the URL and was able to experience many of the non-invasive measures conducted, specifically carotid ultrasounds. I was able to read 20 carotid ultrasound scans using the Carotid Analyzer software and produced a plaque characterization dataset. Lastly, I worked with professors and PHD students/graduates in creating a codebook of the MsHeart study variables and how they harmonize with the AHA's Life Simple 7.

Conclusion: Overall, non-invasive subclinical CVD measures, such as ultrasound-based carotid plaque characterization, may provide a better understanding of a person's health in both clinical and research settings. These measures are valuable research tools that may help elucidate the relationship between behavioral and lifestyle factors and atherosclerosis. This internship illustrated the importance of carotid ultrasounds, and how they are used in research to improve our understanding of carotid plaque development and reducing CVD burden.

Presenter: Basma Dib

*Agency: University of Pittsburgh, Graduate School of Public Health,
Department of Epidemiology
Preceptor: Lisa Bodnar, PhD, MPH, RD*

Linkage of Mothers' Pregnancies Over Time Using Probabilistic Matching

Background/Objective: Datasets that follow mothers' pregnancies over time are lacking. Such datasets can be used to undergo longitudinal analyses related to maternal issues, such as inter-pregnancy weight gain. The objective of our work is to use Pennsylvania's fetal death and birth records to link mothers' pregnancies over the time period 2003-2011. Social security numbers are not always provided by the State's Department of Health, so the matching process should rely on a combination of other identifying variables. "Probabilistic matching" is a known data linkage method used to link datasets with no common unique identifier. Our work aims to validate the use of a set of non-unique identifying variables for the matching process.

Methods: We applied the concept of probabilistic matching using Stata's existing packages to achieve our desired linkage. We estimated the weights for identifying variables using dtalink command and then used reclink2 command for the matching process. We carried out the linkage in two phases using six-month interval subsets of the data. For the first phase, we used a "gold standard" set of identifying variables (including the mothers' social security number variable). For the second phase, we used a set of "alternative" identifying variables (excluding the mothers' social security number variable). Using clevmatch command, we manually reviewed a sample of the resulting matches from each phase to determine the appropriate match score cut point to declare a matched pair as a definite match.

Results: We matched the first six-month interval of our data to the rest of the dataset. After manually reviewing the resulting matches, we decided to consider matches with a match score of 0.85 or higher as definite matches. The alternative variables were able to identify 95.5% of the matches identified by the gold standard variables.

Conclusion: We successfully linked the first six-month interval of our data using probabilistic matching. As the social security number is not always provided with the state's records, using other identifying variables could result in identifying 95.5% of the matches identified when using the social security number. We are to repeat this matching process using six-month intervals of our data till the end of 2011.

Presenter: Ann Stanton

*Agency: Allegheny County Health Department, Pittsburgh Summer Institute
Preceptor: Kristen Mertz, MD, MPH*

Hospitalizations of Persons with Hepatitis B and C in Allegheny County, 2016-2019

Background/Objective: Several million people in the United States are infected with Hepatitis B virus (HBV) or Hepatitis C virus (HCV), both viral liver infections that can lead to cirrhosis or liver cancer. Characteristics of Allegheny County residents hospitalized with HBV or HCV from 2016 through 2019 were examined in order to identify groups at highest risk.

Methods: Statistical Analysis Software (SAS) was used to analyze patient de-identified data from the Pennsylvania Health Care Cost Containment Council datasets, which include up to 17 diagnosis codes. Only hospitalizations of Allegheny County residents with an HBV or HCV ICD-10 diagnosis code, and an admission date from 2016 through 2019, were included. SAS was used to determine the number of hospitalizations for each infection type, sex, race, and age group. The rate of hospitalizations per 100,000 population was calculated, and the percentage of hospital admissions that had an HBV or HCV diagnosis code was calculated for each year.

Results: Hospitalizations with an HCV diagnosis were more common than those with an HBV diagnosis (290.8 hospitalizations per 100,000 population versus 24.4 per 100,000 population). Few HCV and HBV hospitalizations were classified as acute (0.7% for HCV and 2.3% for HBV). Both HCV and HBV hospitalizations were more common in men than women (M:F ratio of 1.4:1 for HCV and 1.7:1 for HBV), and were more common in Black residents than white (B:W ratio of 2.8:1 for HCV and 2.6:1 for HBV). For both HCV and HBV, hospitalizations were most common in the 55 to 64 year age group. Finally, the percentages of hospitalizations with an HBV diagnosis were constant between 2016 and 2019 at around 0.2%, while the percentage of hospitalizations with an HCV diagnosis decreased, from 2.7% in 2016 to 1.8% in 2019.

Conclusion: The prevalence of HCV and HBV diagnoses among persons hospitalized is one measure of the burden of these diseases. The higher burden in Black residents, males, and the 55 to 64 year age group mirrors the pattern of reported cases in Allegheny County. The declining trend in HCV hospitalizations mirrors a similar trend in reported HCV infections in the county.

Presenter: Elizabeth Swart

*Agency: Healthy Environments and Strong Bodies Working Group
of The Pittsburgh Study*

Preceptor: Catherine L. Haggerty, PhD, MPH

Development of a Community-Based Survey of Healthy Environments and Associated Childhood Thriving: The Pittsburgh Study

Background/Objective: Childhood development is shaped by a combination of family, environmental, biological, and societal experiences. Attainment of developmental milestones relies heavily on the interplay of both individual- and community-based barriers and supports, including access to greenspace, clean water, and fresh food. This survey aims to assess community perceived barriers, supports, and needs to guide future research on environmental factors and biological pathways that influence maternal and child health. This survey is designed to support the development of ongoing research and planning of new interventions as part of The Pittsburgh Study (TPS), a longitudinal research initiative that follows children from before birth through high school.

Methods: Metrics used to evaluate and promote healthy childhood development were collected from a literature review of published studies in the United States using PubMed/MEDLINE. Electronic database review was supplemented with a grey literature review to analyze school-, local-, and national-based childhood wellness initiatives. Surveys previously published by the Allegheny County Health Department were examined for any overlap in existing data. A Qualtrics survey was developed and will be distributed in-person and online to reach a diverse population. Participants will be recruited from family support centers/groups, food rescue organizations, health fairs, and UPMC Children's Hospital.

Results: Four key elements were identified and used to evaluate healthy environments, including 1) food access/security, greenspace, and neighborhood quality; 2) indoor/outdoor environment; 3) healthcare utilization and communication; and 4) health/wellness practices. Force-rank questions are used to identify specific items within each category to determine what the community feels is most important to address through community-based programs. Comprehensive exposure data (blood lead levels and willingness to provide a body sample) and vaccine utilization/knowledge will be measured. Community values, strengths, and needs will be assessed using a thematic analysis approach.

Conclusion: Findings from this survey will expand the evidence-base for which factors may support a healthy, nurturing environment that promotes optimal childhood development. Items identified as most important to the community will shape the research agenda of the Healthy Environments and Strong Bodies Working Group of TPS and will ultimately inform the design and implementation of community-level policies intended to reduce developmental vulnerability in children.

Presenter: Amina Chtourou

*Agency: Allegheny County Health Department
Preceptor: Earl Hord, MPH*

Allegheny County Overdose Fatalities, 2020

Background/Objective: Drug overdoses are a critical public health issue in the U.S. and in Allegheny County. Overdose surveillance is necessary to inform evidence-based prevention response efforts, identify overdose outbreaks, and bring awareness to trends and changes in overdose fatalities. The objective of this internship was to create a report highlighting 2020 overdose death summary statistics and trends in Allegheny County.

Methods: Overdose death data obtained from the Allegheny County Office of the Medical Examiner (ACOME) and other overdose data from ED admissions and EMS are compiled by ACHD Overdose Surveillance staff to create an Overdose Dashboard. Overdose data were cleaned, and descriptive statistics were generated in SAS 9.4. Death rates by demographics and location were calculated using 2010 U.S. census data. Figures were created in Tableau 2021.1, QGIS 3.10, and Microsoft Excel.

Results: In 2020, there were 689 overdose deaths, or 56.2 per 100,000 in Allegheny County. Deaths were over twice as high for males compared to females. The overdose fatality rate per 100,000 was highest among the Black population (96.4 per 100,000). Black males aged 55 to 64 years old experienced the highest death rate (342.7 per 100,000) compared to all other combinations of age group, race, and sex. Opioids were associated with 93% of deaths, mostly driven by the presence of fentanyl which was found in 86% of deaths. Heroin and cocaine were also common substances, each being involved in 42% of deaths. Of all Allegheny County municipalities and Pittsburgh neighborhoods, the Middle Hill, Knoxville, and Stowe had the highest overdose death rates at 5.3, 3.5, and 3.1 deaths per 1,000, respectively.

Conclusion: Significant racial and geographic disparities exist among overdose deaths in Allegheny County. Overdose fatalities and inequities are important to understand because of the significant psychological and emotional impact they can have on families and communities. Overdoses are preventable with a multi-faceted approach including improving access to treatment, expanding naloxone distribution, providing overdose prevention education, and promoting harm reduction messaging in Allegheny County communities.

Presenter: Mya Brady

Agency: UPMC Presbyterian-Shadyside, Infection Prevention and Control Department

Preceptor: Graham Snyder, MD, MS

Transmission Mapping of Healthcare Infection Clusters: A Scoping Review

Background/Objective: Understanding transmission of COVID-19 in healthcare settings is critical to infection prevention and control efforts to mitigate the spread, particularly to vulnerable populations. Implementing interventions to interrupt transmission requires deriving hypothesized transmission pathways. Visualizations of transmission pathways can allow for hypothesis generation. The objective of this project was to conduct a scoping review of the literature of transmission visualizations in the health care setting.

Methods: Medline (Ovid) was searched using a combination of MeSH terms and title, abstract, and keywords developed in tandem with a Health Sciences Librarian. Terms were cross-referenced with a set of known studies to ensure that the search would capture relevant articles. Article eligibility criteria was determined a priori. Inclusion criteria contained the following: published after 1985, written in English, peer-reviewed, healthcare facility infectious disease transmission, an infectious disease with ≥ 1 transmission event or infectious diseases with a National Healthcare safety Network (NHSN) definition, ≥ 1 data visualizations of transmission using data observable by an Infection Preventionist showing temporal and/or spatial relationships using patient health data. The articles will be screened and selected using DistillerSR reviewing software and OSF for transparency purposes.

Results: Initial search yielded 1,958 articles. The extracted data on transmission visualizations in healthcare facilities, common spatial and temporal elements contained in visualizations will be used to create an ideal mapping tool using ArcGIS. The map will be able to visualize COVID-19 cases during a period of time and will allow for easier identification of trends and generate transmission hypotheses.

Conclusion: Results gathered from the scoping review will aid in Infection Preventionists' understanding the types of transmission visualizations that can be created and the most essential elements to include when generating transmission hypotheses. It will also inform the creation of a standardized mapping tool that can be used to understand current COVID-19 cases or other infectious disease cases in healthcare settings to ensure that infection prevention interventions can be initiated sooner to prevent further spread of disease.

Presenter: Nneoma Uzoukwu

Agency: Lakeshore Cancer Center, Lagos, Nigeria

Preceptors: Boluwatife Malomo, Taofik Adetoro, and Mutiu Jimoh, MD

The Impact of Covid-19 on Cancer Care in Nigeria: A Qualitative Study Synthesizing Health Care Providers' and Patients' Perspectives

Background/Objective: Pre-pandemic, low resource countries such as Nigeria faced many challenges with providing adequate cancer care. The COVID-19 pandemic has exacerbated these problems and created new challenges regarding cancer care delivery in Nigeria. The objective of this project is to assess the impact of the COVID-19 pandemic on cancer care in Nigeria through health care providers' and patients' perspectives.

Methods: Five focus groups were conducted among health care providers (N=12) working at the Lakeshore Cancer Clinic in Lagos, Nigeria, and web-based surveys were administered to cancer patients (N=40) receiving treatment at the clinic. Providers must have met the inclusion criteria of working at Lakeshore prior to the pandemic and patients must have had at least one cycle of cancer treatment before February 27, 2020, when the 1st COVID-19 case was diagnosed in Nigeria. Providers were assigned into focus groups based on their field of work (doctors, nurses, pharmacists, medical laboratory scientists and radiologists/radiographers). The focus group interview questions focused on the challenges of cancer care in Nigeria before the pandemic, during the pandemic, and what new challenges may likely persist post-pandemic. Patient surveys collected information on patients' demographics, patient experiences with cancer during the Covid-19 pandemic, as well as the pandemic's effect on patients' social support. Transcribed discussions from focus group interviews were coded and analyzed using NVivo 12, while patient surveys were analyzed using STATA 16.

Results: Health care providers' responses reflected the following themes: decreased patient support; decreased resources; less available staff; decrease patient accessibility of care; and increase patient financial distress. These results show challenges faced before the pandemic have worsen and have inadvertently resulted in a greater proportion of patients presenting with late-stage cancer, worsening patient outcomes.

Conclusion: The healthcare providers' and patients' perspectives on the impact of the Covid-19 pandemic on cancer care in Nigeria provides an understanding of the serious challenges they face regarding access to quality cancer care during the pandemic. These are challenges that may likely persist post-pandemic and are detrimental.

Presenter: Emily VanWagoner

Agency: University of Pittsburgh, University Counseling Center

Preceptor: Jay Darr, PhD, LPC, PMP

The Impact of COVID-19 on University Students' Mental and Social Well-Being: A Preliminary Analysis

Background/Objective: There is evidence to suggest that the COVID-19 pandemic has impacted physical and mental health globally. According to the Center for Collegiate Mental Health (CCMH), mental health impacts of the pandemic are nuanced. The Counseling Center Assessment of Psychological Symptoms (CCAPS) did not differ significantly between those seeking care due to COVID-19 compared to those who were not. The goal of this internship was to use CCMH data as a framework to provide preliminary analyses of data collected by the University Counseling Center (UCC) to be used internally to improve services and identify gaps in data.

Methods: Data for clients at the UCC were obtained through the electronic medical record system, Titanium. Throughout the school year, there were several avenues of data collection compiled into this system from different forms. These data included demographics, reason for the clients' visit, client satisfaction with the services received at the UCC, and reports on how COVID-19 impacted different aspects of life. Summary statistics were generated from these data to be used internally to better understand clients as a collective and used to improve processes to provide more comprehensive care. The initial data form for each client included several questions to ascertain if and/or how COVID-19 had negatively impacted different aspects of clients' lives. Understanding how the pandemic has impacted clients in the past year could allow for improved support and understanding of client experiences in this ongoing public health crisis.

Results: The CCMH reported that only 33% of students sought care as a because of COVID-19. They also found that 85% of students reported at least one area of their life was negatively impacted by COVID-19. Analyses were done to see how clients of the UCC compare to data reported in the CCMH report.

Conclusion: Continual evaluation of data collected at the UCC is necessary to adapt processes and provide thorough care to clients. These data can be used to identify gaps in care, work to improve level satisfaction with services provided, and understand how COVID-19 impacted student well-being to provide students with the best care and support possible.

Presenter: Rosie Benford

Agency: Allegheny County Health Department, Pittsburgh Summer Institute

Preceptors: Jennifer Fiddner, MPH, CIC and Josh Feldmiller, MPH

Reducing Preventable Child Fatalities: Allegheny County Child Death Review, 2011-2020

Background/Objective: The Child Death Review Program is a national initiative aimed at reducing preventable child deaths via fatality reviews and evidence-based prevention strategies. The Allegheny County Child Death Review Team (ACCDRT) is an interdisciplinary team that is responsible for conducting case reviews of preventable deaths of residents aged 21 years and younger, analyzing data, and creating prevention recommendations. The purpose of this internship was to create issue briefs on preventable child deaths in Allegheny County to aid the ACCDRT, community prevention partners, and elected officials in intervention implementation.

Methods: Death certificate data from 2011 through 2020 were analyzed by ICD-10 codes to calculate descriptive statistics using SAS 9.4. ArcGIS Pro 2.4.1 was used to visualize density of deaths by municipality in Allegheny County. Risk factor data from 2018 through 2020 from the National Fatality Review-Case Reporting System and UPMC Children's Hospital of Pittsburgh were analyzed using SAS 9.4. U.S. population census data from 2010 were used to calculate rates in Microsoft Excel. Five issue briefs were created to describe youth homicides, suicides, unintentional overdoses (OD), motor vehicle crash (MVC) fatalities, and sudden unexpected infant deaths (SUID) related to unsafe sleep conditions for Allegheny County, PA.

Results: Homicide accounted for the highest number of preventable child deaths in Allegheny County (n=292). ODs were the leading cause of unintentional deaths among Allegheny County youth (n=116). Almost all SUIDS occurred in unsafe sleep conditions. Rates for Blacks were higher than those for Whites for homicide and SUID but lower for OD. The majority of suicide and MVC victims were male.

Conclusion: Understanding trends and disparities in preventable child deaths is necessary for the ACCDRT, community prevention partners, and elected officials to target interventions towards populations most impacted. Child fatalities have devastating effects on families and communities and require multifaceted approaches to promote the wellbeing and safety of children and eliminate preventable child deaths in Allegheny County.

Presenter: Samantha Bayer

*Agency: University of Pittsburgh, Graduate School of Public Health,
Department of Epidemiology
Preceptor: Evelyn Talbott, DrPH, MPH*

The Effects of Unconventional Oil and Gas Drilling on Childhood Cancer: A Preliminary Data Collection

Background/Objective: Since 2005, Western Pennsylvania has seen an increase in environmental and occupational risk factors, including farming, pesticide exposure, industrial exposures, and unconventional oil and gas wells (UNGO). The objective of this experience was to contribute to recruitment and follow-up activities for a case-control study that examines the effects of these exposures on childhood cancer in Western P.A. This exploration shed light on the fact that UNGO have been in operation in other areas of the U.S. for a longer time. Thus, I explored whether secondary data sources were available within other active UNGO drilling states to carry out a preliminary analysis of health outcomes in those areas.

Methods: County-level cancer incidence data were requested from four states with high UNGO activity: Texas, North Dakota, Colorado, and Louisiana. A request for IRB approval was initiated to obtain HIPAA compliant de-identified datasets. These datasets will be used to conduct an analysis of the standardized incidence rates of these cancers in high UNGO counties versus non- UNGO counties within each of these states and consider other industrial and environmental activity as covariates, dependent on the available population at risk. County-level data were obtained for other industrial activity, including the USEPA Toxic Release Inventory (TRI). TRI long datasets were cleaned, merged, and converted to wide datasets in Microsoft Excel.

Results: TRI data were obtained and processed for 1997-2019. Out-of-state cancer data requests were submitted to Texas, Colorado, Louisiana, and North Dakota state cancer registries. Responses to data requests were received from Texas and Colorado. To date, we have received a long dataset from Texas, and are currently in correspondence with Colorado to receive their dataset. Standardized incidence ratios by age groups will be calculated at the county level dependent on available sample size.

Conclusion: This experience emphasized that data management is an essential component of conducting research. When planning a research study, it is necessary to allot for sufficient time to obtain and prepare all the necessary data before conducting any analyses. The out-of-state cancer outcome data I collected will ultimately be used for further analysis in my masters' essay.

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Overview of SARS-CoV-2 Serology Testing in the UPMC Health System by Facility

Background/Objective: Testing for SARS-CoV-2 antibodies has utility in the clinical setting by establishing if an individual has had a prior SARS-CoV-2 infection. There is uncertainty surrounding the immune correlates of protection against COVID-19. Therefore, incorrect interpretation of results may increase individual risk of infection and/or transmission of COVID-19. As part of my internship with UPMC, I characterized SARS-CoV-2 serology testing by UPMC facility from April 2020 to June 2021 with the goal of informing diagnostic stewardship.

Methods: The study population is all UPMC patients who received a SARS-CoV-2 serologic test from April 1, 2020 to June 30, 2021. Data was pulled using Theradoc electronic surveillance software. The primary outcome is number of antibody testing ordered at each UPMC facility, broken down monthly by number of patients tested, type of tests ordered, and result type. Monthly COVID-19 discharge data per facility was used for comparison. The monthly percentage of patients who tested antibody-positive was compared to seroprevalence data for Pennsylvania during each month. Analysis was done using R statistical software version 4.0.3 and Excel.

Results: A total of 14,880 antibody tests were ordered during the study period. The highest concentration was during the second quarter of 2020 with 5627 tests. Q2 2021 had the second highest tests with 4774 tests. The larger facilities had greater initial screening efforts that tapered off. Almost all facilities saw testing increase after vaccine introduction. The rates of antibody positivity by facility were consistently higher than the seropositivity estimates for the Commonwealth of PA overall.

Conclusion: This system-level report was the first characterizing the use of SARS-CoV-2 serology testing across UPMC facilities. Testing practices vary amongst institutions, with some having considerable differences in testing relative to their COVID-19 patient burden. Overall, serology testing increased in most facilities following wide availability of the COVID-19 vaccine in Spring 2021. Further investigation is needed to examine why these tests were ordered using provider surveys or deeper medical record abstraction.

Notes

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