

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!



Epidemiology in Action!
Annual Internship Poster Session
Abstract Book
Thursday, October 3, 2019



NOTES

Presenter: Guy Agostinelli

*Agency: UPMC Children's Hospital of Pittsburgh, Quality & Safety,
Infection Control Team*

Preceptor: Lindsay Montoya, MPH, CIC

Investigation of Healthcare-Associated Ventriculitis and Meningitis Surgical Site Infections at a Tertiary Care Pediatric Hospital

Background/Objective: Healthcare-associated ventriculitis or meningitis associated with ventriculoperitoneal shunt (VPS) surgeries are a significant challenge to pediatric neurosurgery. The cost of treatment for shunt infections is between \$30,000 to \$60,000 and even successfully treated infections lead to long term morbidities such as seizures, cognitive impairment and worse long-term quality of life. Recently, an increased rate of organ-space infections associated with VPS surgeries at UPMC Children's Hospital of Pittsburgh (CHP) was observed and were associated with a particular surgeon (surgeon B). The present study investigates that association and to explore potential risk factors associated with VPS surgeries using a retrospective case-control analysis and propensity score analysis.

Methods: 18 Cases and 56 controls selected from CHP medical records were analyzed on 22 variables consisting of patient risk factors (age, sex, etc.) and hospital-specific covariates (surgeon choice, surgery length, off-hours surgery, etc.). Logistic regression was used to assess the association between covariates and infection. Multivariable logistic regression was used to test the association between surgeon choice and infection while controlling for significant covariates. Propensity scores were generated for all patients and stratified by surgeon to test case complexity between cases and controls.

Results: Patient risk factors that were associated with infection included premature birth, intraventricular hemorrhage, myelomeningocele, and past revisions ($P < 0.05$). All hospital covariates analyzed were nonsignificant except for surgeon B ($P = 0.048$). The multivariate model included sex, age, past revisions, premature birth, intraventricular hemorrhage, and myelomeningocele. Surgeon B was not associated with infection in the multivariate model ($P = 0.305$). Propensity scores showed a significant difference between cases and control for Surgeon B ($P < 0.0001$). There was no significant difference in propensity scores between Surgeon B's cases to other infection cases ($P > 0.05$).

Conclusion: None of the hospital covariates analyzed were included in the final logistic model due to non-significance, suggesting a complex etiology of infection. Surgeon B was shown to not be associated with infection after controlling for patient risk factors. Additionally, the propensity score analysis suggests that infection is independent of surgeon. Further research should investigate perioperative approaches to infection prevention not obtainable from the medical records.

Presenter: Hannah Allen

Agency: *Cardno ChemRisk*

Preceptor: *Natalie Egnot, DrPH*

Man-made Vitreous Fibers and Non-malignant Respiratory Diseases: A Systematic Review

Background/Objective: Man-made vitreous fibers (MMVF) are inorganic fibers that are commonly used as thermal or acoustic insulation in buildings, vehicles, and appliances. Over nine million person-years of follow-up accrued by several occupational cohort studies suggests that workers exposed to MMVFs do not experience increased risk of cancer mortality; and in 2002 the International Agency for Research on Cancer (IARC) classified glass, rock (stone), and slag wools as *not classifiable as to their carcinogenicity to humans*. Despite extensive research concerning the potential carcinogenicity of MMVFs, evidence regarding the effects of occupational MMVF exposure on non-malignant respiratory disease risk (NMRD) is scarce and has not been synthesized by any prior systematic review or meta-analysis.

Methods: We conducted searches of the PubMed and Scopus databases to identify all epidemiological studies evaluating the association between MMVF exposure and NMRD published since the 2002 IARC Monograph. We reviewed reference lists of all relevant articles and each of the studies published before 2002 in the Monograph. When multiple studies reported on the same population, the most recent study with the longest follow-up was included. Our systematic review was conducted following PRISMA guidelines.

Results: PubMed and Scopus databases identified 62 articles published January 1, 2002 – June 15, 2019. Nine pre-2002 articles were identified in the IARC monograph and 14 articles were included from the references of eligible studies. Upon full review, 23 relevant articles were identified, 12 of which reported only on the prevalence of respiratory symptoms and subclinical disease. Within the studies that reported on our NMRD of interest (ICD-10 codes J00-J99), the cohort studies (n=6) reported effect estimates ranging from SMR=0.54 (95% CI: 0.33, 0.84) to SMR=1.19 (95% CI: 0.74-1.82). The only cross-sectional study reported increased odds of chronic bronchitis among workers (OR=2.28, 95% CI: 1.07-4.06) after controlling for smoking status, cigarette pack years and years of asbestos exposure.

Conclusion: Evidence from several occupational cohort studies suggests that MMVF manufacturing workers do not experience increased risk of NMRD mortality compared to the general population; however, our conclusions are limited by the fact that none of the relevant, published studies we identified on this topic evaluate incidence of NMRDs.

Presenter: Julia Yudkovicz

Agency: *University of Pittsburgh, Department of Epidemiology*

Preceptor: *Allison L. Kuipers, PhD*

The Genetic Correlation between Subclinical CVD and Cognitive Function

Background/Objective: Although measures can be taken to prevent or improve the outcomes of cardiovascular disease (CVD), millions of Americans remain affected by CVD and its subsequent complications. Over the past decade, medical research has shifted towards evaluating the genetic determinants of chronic disorders such as CVD and its comorbid diseases. Our current objective was to evaluate if cognitive factors or physical measures share a common genetic basis with subclinical CVD measures.

Methods: Participants for the current study included families from the Long Life Family Study who were recruited for exceptional longevity. Subclinical CVD was assessed using carotid ultrasound to measure carotid intima-media thickness (IMT) and atherosclerotic plaques, as well as, via measurement of blood and pulse pressures. A number of physical and cognitive function tests (including, gait speed, general cognitive function, working memory and semantic fluency) were conducted at the time of CVD assessment. We used SOLAR to estimate the genetic heritabilities of each subclinical CVD, cognitive and physical measure, as well as the genetic and phenotypic correlation between subclinical CVD and functional measures. All models were adjusted for age, age², sex, field centers, height, weight and whether or not participants currently smoke.

Results: All subclinical CVD and functional measures were significantly heritable (all $p \leq 0.01$). There was a significant genetic correlation ($p=0.001$) between the mean carotid IMT and pulse pressure values, as well as, significant phenotypic correlations between mean carotid IMT and systolic blood pressure (SBP) ($r=0.082$), diastolic blood pressure (DBP) ($r=-0.09$), and pulse pressure ($r=0.184$) (all $p \leq 1.0 \times 10^{-4}$). Of all the tested cognitive and physical function measures, mean carotid IMT was genetically correlated with working memory ($p=0.009$), and both SBP and DBP were genetically correlated with semantic fluency and overall cognitive function (all $p \leq 0.04$). However, there was no significant genetic or phenotypic correlations for pulse pressure.

Conclusion: Evidence from this study suggests that subclinical CVD shares a common genetic basis with cognitive but not physical function measures. This may allude to a potential biologic interaction between cognition and vascular function in older adults, in which subclinical CVD precedes cognitive decline or deterioration.

Presenter: Vijay Vedachalam

Agency: Birmingham Free Clinic

Preceptors: Sharon E. Connor, PharmD; Mary I. Herbert, MS, MPH

Introducing New Chronic Disease Interventions for Improved Health Outcomes at a Student-Run Free Clinic

Background/Objective: The mission of the Program for Health Care to Underserved Populations (PHCUP), which operates at the Birmingham Free Clinic (BFC), is to facilitate, provide, and improve access to high-quality care among those in need. For over 23 years, the PHCUP has delivered comprehensive primary health care, at no cost to any patient. 42% percent of BFC patients are homeless, and 80% have incomes at or below 200% of the federal poverty level. Many of our patients are underserved and uninsured, as well as many patients who belong to minority groups and non-English speaking communities.

Methods: We have worked on interventions for chronic disease patients, specifically with diabetes, hypertension, asthma, and COPD, to improve their personal disease management through social determinants of health screening, preventative care, and other methods specific to each patient.

Results: I worked with other members of the clinic team to develop a manual for incoming students and clinicians to get acquainted with the Department of Health project for chronic disease patients. We had outlined the entire workflow process with interventions specific to each of the four main chronic diseases in the clinic. With the help of the new pharmacy resident, we began a new social determinants of health screening tool. As a part of maintaining funding from the Department of Health for our chronic disease project at the clinic, we need to report quarterly on certain health indicators for our patient population. To increase our workflow efficiency, I developed a SAS program to match relevant data points with each patient and to generate a total number of patients that improved since the last quarter.

Conclusion: By interviewing patients, I was able to see what was preventing them from controlling their disease and leading a healthy life, and unsurprisingly, the health beliefs that prevent that was shared by many patients and could be properly addressed. When I made recommendations to the rest of the clinical team, we adjusted our patient plans for managing their healthcare in the clinic but also advised them how to lead healthier lives at home by promoting patients' self-efficacy. I will be continuing to make new analyses on our patient population to assess areas of improvement and new potential interventions for hopefully an increased rate of improvement since the last quarter.

Presenter: Hiba Anwer

Agency: Allegheny County Department of Health and Human Services

Preceptor: Eric G. Hulse, DrPH, MA

Allegheny County Health Department – Naloxone Distribution and Training

Background/Objective: In 2015, Allegheny County issued a standing order for naloxone: anyone in Allegheny County can go to a pharmacy and purchase naloxone without a prescription. Since then, the Allegheny County Health Department's (ACHD) pharmacy has distributed approximately 15,000 naloxone kits. Alongside distribution, ACHD's community outreach workers hold trainings at various locations such as libraries and nonprofit organizations. ACHD was interested in summarizing and visualizing data in order to plan for future naloxone distribution

Methods: ACHD records organization's names and the number of naloxone kits that are requested and the date they are delivered. Similarly, training events organization's name and approximate number of attendees are also recorded in an Excel spreadsheet. These data were used to assign addresses to organizations and classified organizations based on stakeholder types. Examples of these stakeholder classifications include: nonprofit organizations, schools, and government agencies. Next, addresses were geocoded in ArcGIS online to create a progressive heat map that showed naloxone distribution and training events over time. Further, I worked with the opioid outreach team to understand their plans for these data. Based on their feedback we together created a public facing data brief that summarized naloxone kit requests by organizations based on stakeholder types and municipalities.

Results: These visualizations of naloxone distribution and training events will allow the ACHD opioid outreach team to plan for future naloxone distribution. This work gave them insight into the areas and organizations that are requesting the greatest quantity of naloxone. The team will also use this summary in future grant applications as well as inform different county departments and municipalities about the work being done at ACHD. This analysis served as one part of a larger goal to better understand the opioid crisis in Pittsburgh.

Conclusion: This experience taught me the importance of finding effective ways to share and visualize data. Even simple breakdowns can have a huge impact, allowing for data informed decisions.

Presenter: Ashlyn Bulas

Agency: Brain Injury Research Center at Mount Sinai

Preceptor: Kristen Dams-O'Connor, PhD

Harmonization of Individual-level Data across Five Longitudinal Cohorts to Evaluate the Relationship between Traumatic Brain Injury (TBI) and Alzheimer's Disease/Related Dementias

Background/Objective: Alzheimer's disease (AD) is a significant public health concern, impacting almost 6 million Americans with growing incidence and prevalence rates. Identifying risk factors for AD is vital for reducing the health and personal burden of AD and related dementias (ADRDs). Traumatic brain injury (TBI), and more recently repetitive head injuries (RHI), are environmental risk factors for AD/ADRD, but results are inconsistent with some studies finding no association between head trauma and dementia. Differences in methods and measures across studies preclude direct comparison. We harmonized existing TBI/RHI exposure and AD data across five, longitudinal cohort studies in service of an NIH-funded R01 aimed to comprehensively investigate the relationship between TBI/RHI and ADRDs.

Methods: To begin this multi-center study, pre-harmonization of existing data from the five cohorts (*ACT, ROS, Rush MAP, MARS, AND FHS*) was performed by identifying overlapping and missing measures amongst studies. Collaborators across the five studies agreed upon harmonization measures to ensure accuracy and reliability of concatenated variables. Harmonization of demographics and TBI exposure domains occurred by item-level coding to merge data with uniform naming and values.

Results: I had a significant role in all harmonization decisions of existing data to assess the effects of TBI/RHI exposure with AD clinical diagnosis. I collaborated with experts nationwide to understand the complexity and subtle distinctions among the studies' data. If individual studies had missing measures, I was participated in the discussion and implementation of new data collection. I also began coding the harmonization of certain demographic covariates and TBI exposure variables to run basic descriptive statistics.

Conclusion: This ambitious, multi-center study ($n > 15,000$) is the first of its kind to undertake the daunting task of conducting the most comprehensive evaluation of the association between TBI/RHI exposure and AD diagnosis. While no analyses have been conducted yet due to the time consuming nature of harmonization and the necessity of new data collection, I gained immense experience in decision making, non-trivial coding, and group collaboration on a national multi-center scale. I will be continuing this work post-graduation and excited to contribute to further epidemiological and clinical strides in the TBI/RHI and AD fields.

Presenter: Hinnah Siddiqui

Agency: University of Pittsburgh School of Medicine, Dept. of Emergency Medicine

Preceptor: Francis X. Guyette, MD, MS, MPH, FACEP

Functional Outcomes and Mortality Rates for Ischemic Stroke Patients Presenting to Rural Hospitals or Urban Hospitals in Pennsylvania

Background/Objective: Stroke is the third leading cause of death in the U.S. Most strokes are caused when clots form in a vessel and block blood flow. Tissue plasminogen activator (tPA) can be used to dissolve the clot quickly. Most debilitating strokes are caused by large vessel occlusion (LVO). Patients in rural areas often lack timely access to specialty stroke care. Transfer to tertiary hospitals may be necessary to access time-sensitive endovascular therapies (ET) needed for LVO. We hypothesized that stroke patients from rural areas had decreased functional outcome and higher mortality rates compared to those from urban areas.

Methods: We collected data on patients in a large regional health system with confirmed ischemic stroke from January 2014-2017. We defined rural hospitals as those located in counties designated as rural by the Center for Rural Pennsylvania. Time to intervention, mortality and modified Rankin scale (mRS) were compared between rural and urban centers.

Results: We included 2,473 patients with confirmed stroke, 1,537 (62%) presented to rural hospitals while 932 (38%) presented to urban hospitals. 43.7% of stroke patients had LVO. Of these, 50.2% of LVO patients presented to rural hospitals and 39.8% presented directly to urban hospitals. Among those initially presenting to a rural hospital, 29% of patients received tPA, while 24% presenting to an urban hospital received tPA. Median length of time from last known well to tPA at a rural hospital was 169 minutes (IQR 71,630) and did not differ from time to tPA at an urban hospital which was 180 minutes (IQR 75, 675) ($p=0.16$). The mortality among patients first presenting to rural hospitals (3.32%) did not differ from patients first presenting urban hospitals (4.57%) ($p=0.2076$). Similarly, 29% (279/936) of patients presenting to rural centers were discharged with a mRS < 3 while 30% (468/1537) of patients discharged from an urban center had a mRS < 3 ($p=0.7364$).

Conclusion: In a system of care with rapid referral and transport, there was no difference in mortality or functional outcomes when presenting to rural or urban centers. Time to intervention (tPA) did not differ among patients first presenting to rural or urban centers.

Presenter: Kathleen Shedlock

*Agency: Allegheny County Health Department, Pittsburgh Summer Institute
Preceptor: LuAnn Brink, PhD, MPH*

Allegheny County Environmental Justice Evaluation Identifies Areas of Need and Quantifies Relationship to Health Outcomes

Background/Objective: Nationally, differences in the built environment, geography, and racial composition lead to disparities in health. These disparities are often greatest between lower income populations and people of color and their white or more well-off counterparts. Thus, social determinants of health have come into greater focus to aid in untangling complex health disparities that cannot be explained by individual factors alone. The creation of an environmental justice index sought to highlight the populations that are more vulnerable to health issues based on who they are or where they live. Ideally, the evaluation would identify areas of highest need and relate to health outcomes potentially associated with environmental triggers and stressors such as elevated blood lead levels and infant mortality.

Methods: This analysis updated the previously conducted Allegheny County Environmental Justice Index (EJI). The overall EJI score consisted of a series of metrics that fell under the wide umbrella of socio-demographic issues; such as race, income, and proximity to high density commercial, industrial, or traffic areas. The metrics were previously identified by a group of Allegheny County community stakeholders to reflect what they felt best represented community health. The previous index was conducted at the census tract level; each metric was ranked into deciles, scored, and averaged to obtain the overall EJI score in each tract. However, in this update each metric was aggregated by neighborhood and municipality boundaries before following the same protocol to find the overall EJI score. Statistical analyses were used to build regression models to compare the scores to lead levels and infant mortality.

Results: Many of the same areas identified in the original Environmental Justice evaluation remained areas of high need in this update. Infant mortality was significantly associated with housing vacancy (IRR 2.05, $p < 0.0001$) after adjusting for air quality and race. Elevated blood lead level was significantly associated with both percent minority population (IRR 1.73, $p = 0.0019$) and median household income (IRR 0.321, $p < 0.0001$) after adjusting for covariates.

Conclusion: This index provides evidence that future programs and funding should be allocated to support areas of high environmental need and potentially reduce common health outcomes in Allegheny County.

Presenter: Kharlya Carpio

*Agency: University of Pittsburgh Graduate School of Public Health, Public Health Dynamics Lab
Preceptor: Wilbert van Panhuis, MD, PhD*

Building a Data Dashboard for the Global Strategy towards the Elimination of Cervical Cancer as a Public Health Problem

Background/Objective: Although HPV is a necessary cause for cervical cancer, other factors contribute to its progression from infection to cancer. In 2018, the World Health Organization (WHO) made a call for the elimination of cervical cancer worldwide. This mission has stimulated the evaluation of different key indicators relevant to HPV elimination, including vaccination program success, and female school attendance rates. The objective of our project was to present the indicators in a country-specific dashboard to monitor the progress of cervical cancer elimination.

Methods: Data were standardized by the WHO Initiative for Vaccine Research (IVR), and loaded into a relational database. We quality checked and examined all variables through exploratory data analysis to identify appropriate visualizations. To summarize the impact of cervical cancer, we computed the average prevalence, incidence, mortality, screening, and vaccination coverage for each country, and compared the country average to the corresponding average values for their WHO region, World Bank income group, and the world. All analyses were conducted using R software version 3.6.0. We designed a dashboard with a graphical user interface to display data relevant to cervical cancer for each country.

Results: The current dashboard comprises three artifacts: (1) a country profile including visualizations, (2) methods with a data dictionary detailing 80 indicators, and (3) an EndNote library containing 572 sources from meta-analyses. Each country profile includes eight visualizations and is divided into six sections (Population & Demographics, Burden of Disease, Predicted Impact of HPV Vaccination, HPV Vaccination Program, HPV Vaccination Strategies, and Cervical Cancer Screening). The dashboard was shared with the WHO in August 2019, and feedback is being incorporated into the next design. A short video will demonstrate dashboard functionality to the WHO's Strategic Advisory Group of Experts (SAGE) on Immunization in October 2019.

Conclusion: This project will build a cervical cancer dashboard for 194 member states, to be hosted by Project Tycho. The dashboard will enhance the capacity of WHO member states in using and analyzing data for the global HPV elimination program.

Presenter: Meg Carr

Agency: Pennsylvania Department of Health/Allegheny County Health Department

Preceptors: Lauren Orkis, DrPH, MPH, CIC/Kristen Mertz, MD, MPH

Limited Hepatitis C Testing Available in Drug and Alcohol Treatment Facilities in Pennsylvania (Preliminary Analysis)

Background/Objective: Hepatitis C is an infectious disease that can cause liver related morbidity and mortality. The epidemic of opioid use has led to an increase in new hepatitis C infections transmitted by intravenous drug use. Pennsylvania is among the top ten states for prevalence of chronic hepatitis C infection with an estimated 209,982 adults with the disease. The Pennsylvania Department of Health (PADOH) conducted a survey of drug and alcohol treatment facilities to assess the breadth of hepatitis C related services offered and to identify barriers to offering these services.

Methods: PADOH collaborated with the Pennsylvania Department of Drug and Alcohol Programs to compile contact information for all licensed drug and alcohol treatment facilities in Pennsylvania. The survey was conducted online and sampling was stratified by urban versus rural facilities, as defined by the Center for Rural Pennsylvania. Non-respondents received two follow-up phone calls to encourage survey completion. Data was cleaned and analyzed using Excel.

Results: Of the 330 drug and alcohol facilities sampled, 316 were eligible for response, of these 242 (76%) submitted surveys. Of the 242 respondents, 76 (32%) test their clients for hepatitis C. Of those, 26 (34%) test all clients. Of the 50 that provide testing but not to all their clients, 40 (82%) reported testing people who inject drugs. Of the 76 facilities that provide testing, in 33 (43%) testing is only provided by an outside organization and in 16 (21%) testing is only provided by referral. Just 24 (10%) of respondents provide onsite confirmatory testing for hepatitis C. The most common barrier to providing hepatitis C testing was funding.

Conclusion: Pennsylvania residents in drug and alcohol treatment are a high-risk population for hepatitis C infection. With just 32% of facilities offering testing to their clients drug and alcohol treatment facilities are an untapped resource for hepatitis C testing and linkage to care in Pennsylvania.

Presenter: Taylor Paglisotti

Agency: Trans Buddy PGH

Preceptor: Kale Edmiston, PhD

Preliminary Implementation of Trans Buddy PGH: Establishing Trust among Transgender Patients and Healthcare Providers

Background/Objective: Transgender people experience myriad health disparities in comparison to cisgender individuals, particularly regarding mental health. Many of these disparities arise from a lack of access to healthcare. Barriers to quality care include lack of provider knowledge, discrimination, and fear of discrimination. Trans Buddy PGH is a local, transgender-led initiative that uses education and peer support to mitigate these barriers. By partnering with local healthcare institutions, we aimed to develop and assess the feasibility of a Pittsburgh-based Trans Buddy program.

Methods: Trans Buddy PGH is modeled after the Vanderbilt University Medical Center's Trans Buddy Program. Trans Buddy PGH pairs transgender patients with trained peer advocates (Buddies) and supports providers through education. Buddies foster a community-engaged support network for transgender patients while helping patients navigate healthcare systems. Over the past 18 months, the majority transgender leadership team of Trans Buddy PGH has worked with healthcare institutions, volunteers, and transgender communities to establish the infrastructure needed for a soft launch of the program.

Results: Trans Buddy PGH has successfully established relationships with UPMC Western Psychiatric Hospital and UPMC Children's Hospital of Pittsburgh, which have both offered resources to support the program in its pilot stages. The program has trained an initial round of volunteers and has begun a soft launch implementation. Volunteers are based in the Center for Adolescent and Youth Adult Medicine's Gender Clinic, are available as-needed at the Diagnostic Evaluation Center and on in-patient units at WPH. Pilot data collection to evaluate the tolerability and feasibility of the program has begun. To date, the program has supported over 60 unique patients.

Conclusion: Trans Buddy PGH continues to successfully partner with local healthcare institutions, transgender community members, and allies. The program has the potential to improve access to care for transgender patients, as well as education for healthcare providers. Future work will focus on program expansion and evaluation.

Presenter: Sarah Morgan

Agency: Jewish Healthcare Foundation

Preceptor: Scotland Huber, MS

**Jewish Healthcare Foundation Internship Experience:
Liftoff and 15217**

Background/Objective: The Jewish Healthcare Foundation (JHF) is a grantmaking foundation that uses research, program management, and project execution to improve healthcare in western Pennsylvania. This summer, the JHF facilitated a public health internship that focused on two projects, Liftoff 2020 and 15217. Liftoff 2020 aims to prepare the Pittsburgh region for coming disruption in the healthcare industry by bringing together the region's healthcare partners with national and international thought leaders, entrepreneurs, and investors to imagine what health care will look like a decade from now and articulate the infrastructure required to get there. 15217 aims to create a community safety net of behavioral and mental health services in the 15217 zip code area.

Methods: For Liftoff, sponsorship contacts and an engagement network were researched, as well as 'best practices' for posting on a variety of social media platforms. Other similar conferences were compared. This included researching patterns in healthcare industry disruption. For 15217, behavioral and mental health services providers were contacted and had information about their services put on a database. Mental and behavioral health campaigns from other regions were researched and compared based on their marketing materials.

Results: A social media calendar was created to schedule content for Liftoff throughout the year. 85 articles were summarized for use in social media content. Over 100 possible sponsorship contacts were categorized. In addition to the finalized provider database and resource wiki for 15217, a comic was created to show adolescents how to use mindfulness and centering techniques in stressful situations. A wiki was built so that program staff could access all documents used by the summer interns, such as school and provider contact information, mental health resources and workshop guides, and a collection of similar mental health campaigns.

Conclusion: This internship was successful in establishing social media practices and a backlog of content for Liftoff. It also contributed deliverables to 15217 which can be both sustainable and built upon in the future. Both projects utilized communications and public health skills.

Presenter: Gabrielle Corona

Agency: Children's Hospital of Pittsburgh, Center for Adolescent and Young Adult Health

Preceptor: Alison Culyba, MD, PhD, MPH

Adolescent-adult Support Networks and Witnessing Firearm Violence among Male Youth in Low Resource Neighborhoods

Background/Objective: Male youth residing in low-resource neighborhoods experience high rates of witnessing violence. Adult connections are important sources of social support for youth, with the provision of both emotional and instrumental support providing protection against multiple health risks, including violence. However, limited research has examined associations between adolescent-adult support networks and witnessing firearm violence.

Methods: We enrolled 45 male youths, ages 13-21, as part of a community-based violence prevention study across twenty low-resource neighborhoods in Pittsburgh, PA. Youth completed social network surveys to define family-, school-, and community-based adult supports who they turn to for emotional and instrumental support and past 30-day witnessing firearm violence. Exposure to past 30-day witnessing firearm violence was measured with six items (e.g. seeing someone get shot) and operationalized as any/none depending on if youth answered affirmatively to at least one item. Logistic regression examined associations between strength of social support and witnessing firearm violence. Wilcoxon rank-sum tests examined associations between network properties (number of adult supports, density, and centrality) and firearm violence.

Results: Mean participant age was 17.6 years (SD=1.5); 77.8% were African American. In the past 30 days, 80% witnessed firearm violence. Increased immediate and extended family support were associated with significantly higher odds of witnessing firearm violence (AOR: 5.55, 95%CI: 1.18-26.11; AOR: 4.75, 95%CI: 1.23-18.28). Details from the in-depth social network survey revealed that the average number of adult supports was 4.8 (range:1-14); 18% of youth listed at least one adult in their network who had been shot or stabbed. Number of adult supports was significantly directly associated with witnessing firearm violence ($p=0.04$). Eigenvector centrality (measure of network connectivity) and mean adult social support were significantly inversely associated with witnessing firearm violence ($p<0.01$).

Conclusion: Findings highlight complex associations between adolescent-adult support network structure, relationship quality, and firearm violence. Associations between family support and witnessing firearm violence may reflect families providing increased support to help youth navigate high levels of community violence. Associations between networks properties and violence exposure suggest that network connectivity and strength of support may act as protective factors.

Presenter: Sarah DePerrior

*Agency: Allegheny County Health Department, Pittsburgh Summer Institute
Preceptor: Lynda Jones, MPH*

Cancer Incidence in Allegheny County, 2011-2015

Background/Objective: Cancer is the second leading cause of death in the United States as well as in Allegheny County. Sex, race, age, and geographic location affect cancer incidence. State and local health departments engage in cancer surveillance to monitor trends over time and identify patterns. The objective of this project was to produce a comprehensive report of cancer incidence in Allegheny County from 2011-2015.

Methods: Records of cancer incidence were obtained from the Pennsylvania Cancer Registry. Guidelines from the National Cancer Institute Surveillance, Epidemiology, and End Results Program (SEER) were used to define cancer site and stage at time of diagnosis. We calculated yearly all-site age-adjusted rates by race and sex. Aggregated age-adjusted rates (years 2011-2015 combined) were calculated for individual cancer sites and were also stratified by race and sex. Allegheny County rates were compared with Pennsylvania state rates queried from the Pennsylvania Department of Health Enterprise Data Dissemination Informatics Exchange (EDDIE). We calculated Incidence rate ratios to compare total cancer incidence in individual neighborhoods and municipalities with the county rate.

Results: Between 2011 and 2015, a total of 38,907 new cases of cancer were diagnosed in Allegheny County, an average of 7,781 cases per year. From 2011-2015, the average annual cancer incidence rate for all sites combined was 485.9 cases per 100,000, compared with the Pennsylvania state rate of 474.9 cases per 100,000. Yearly cancer rates have remained stable between 2011-2015, both overall and when stratified by race and sex. The most commonly diagnosed cancers included cancers of the breast (15.2% of total cases), lung and bronchus (15%), prostate (10%), colon and rectum (8.6%), and urinary bladder (5.5%). Rates of cancers of the lung and bronchus, thyroid, larynx, and leukemia were significantly higher in Allegheny County compared with PA overall, whereas the rate of melanoma was significantly lower in Allegheny County.

Conclusion: Describing the incidence of cancer by both site and demographic characteristics is an important part of county-level cancer surveillance. This report will serve as a resource for Allegheny County officials in monitoring trends and informing public health practice.

Presenter: Sejal Mistry

*Agency: Allegheny County Health Department, Pittsburgh Summer Institute
Preceptor: Jennifer Fiddner, MPH, CIC*

Allegheny County Health Department: Child Death Review Team

Background/Objective: The Child Death Review Program is a national initiative to reduce preventable child deaths and increase the safety of children. Local teams are comprised of multiple stakeholders that volunteer time to review and identify prevention efforts. The Allegheny County Child Death Review Team (ACCDRT) meets monthly to review child death cases. My role with ACCDRT involved preparing 9 cases for presentation in the unintentional review, and data managing cases from 2017 to create updated rates and issue briefs to communicate the team's findings.

Methods: For the review, all unintentional deaths of children under the age of 21 in Allegheny County in the past 6 months were retrieved from vital statistics. We examined Death Scene Investigation (DSI) reports to determine cause of death. Demographics, cause of death, events to death, medical history were presented. For the 5 issue briefs, 2017 data were cleaned and managed in SAS. I created variables for age, race, sex, and manner of death, and the data were merged with 2008-2016 data to create rates and graphs. The 5 issue briefs: homicide, suicide, sudden unexpected infant death (SUID), overdose, and motor vehicle crash (MVC).

Results: The unintentional review identified 9 cases and decided on prevention efforts that are shared with the Commonwealth of Pennsylvania, State Child Death Review Team. The issue briefs reported multiple rates and prevention points with the updated 2017 data. Surveillance measures of concern in Allegheny County among child deaths include 76% of homicides were African American males, 80% of suicides were male, 56% of infants dying due to SUID were African American, 50% of MVC deaths were white males, and 93% of overdose deaths were white.

Conclusion: My involvement in the ACCDRT allowed me to expand my skills and get a glimpse of how multiple project management occurs in the Allegheny County Health Department. The unintentional review required investigation of individual cases, determining the information to present, and then preparation of the case in a manner that is succinct but informative to a diverse group of stakeholders. The issue briefs involved SAS skills in data management and cleaning, census tract data extraction for populations, and calculating rates. Lastly, health communication skills were essential for development of the briefs.

Presenter: Alexa J. Meinhardt

Agency: Delaware Division of Public Health Office of Medical Marijuana

Preceptor: Paul R. Hyland, MBA, MPA

Medical Cannabis Provider Education: State of Delaware

Background/Objective: Delaware passed its Medical Marijuana Law in 2011. Over 8,400 patients in Delaware, including 25 pediatric patients, are certified as having a qualifying medical condition to use medical cannabis as part of the state's Medical Marijuana Program. However, healthcare providers cite a lack of knowledge about medical cannabis that prohibits them from ensuring their patients receive the best-available information about medical cannabis and achieve optimal health while enrolled in the program. The purpose of this internship was to develop continuing medical education (CME) materials to educate physicians on 1) medical cannabis policies/procedures in Delaware; 2) physiological processes of cannabis in the body; and 3) adverse events, contraindications, and dose-response relationships of medical cannabis.

Methods: Engaging key stakeholders, both within and outside the state, was critical to understanding baseline knowledge and perceptions of medical cannabis. Stakeholders include physicians of various specialties, such as family medicine and women's health; Medical Society of Delaware; International Research Center on Cannabis and Mental Health; Christiana Care Health System; and medical cannabis compassion centers (including growth sites and dispensaries). Additionally, a review and critique of evidence on the use of medical cannabis as a therapy for health conditions and an exploration of program metrics, including demographics of enrolled patients, were employed to develop training materials. The activity was promoted via email, event postings in hospitals/medical organizations, and word-of-mouth.

Results: I created an informative, neutral, and scientific 52-slide PowerPoint presentation. Twenty-three healthcare professionals attended an hour-and-a-half-long pedagogic CME presentation and question & answer session at the Medical Society of Delaware. The Medical Marijuana Program's consultant, an expert in the endocannabinoid system, delivered the presentation. The presentation was professionally pre-recorded and will be turned into a webinar to be used as enduring CME material.

Conclusion: Audience members appeared curious, engaged, and highly receptive of the presentation. Many were inquisitive about the program's legal ramifications and the type of medical cannabis product patients use. Delaware's medical community seemed to have benefited from a formal education session. Given the level of interest and the questions received, future educational activities should be implemented to enhance providers' access to cannabis education resources and provide program updates, with the underlying goal of serving patients to the best of the program's ability.

Presenter: Mark Greenhalgh

Agency: University of Pittsburgh, Human Engineering Research Laboratories

Preceptor: Rory A. Cooper, PhD

An Assessment of Assistive Technology Needs for Women Veteran Wheelchair Users

Background/Objective: As the population grows older and disability continues to become an important public health issue, it is imperative to develop technologies and implement community interventions that attend to the needs of the people who require them. Almost 20% of Veterans served by the US Department of Veterans Affairs will be women by 2040. Women using wheelchairs express concerns with current standards, which do not address needs unique to females as opposed to males. The following assessment analyzes survey and focus group data from female Veterans relying on mobility aids, such as wheelchairs. Information collected creates a roadmap for addressing women's assistive technology needs in addition to disability equity by gender

Methods: Twenty-four women from two paralyzed Veteran sporting events were asked to fill out a survey and partake in a focus group, where they expressed unique needs and wants regarding the state of their assistive technology and future direction they would desire for themselves and other women wheelchair users. Demographics and survey outcomes were analyzed based off frequencies and percentages of answers while common themes were identified from focus group data based off prior literature and participant perspectives.

Results: Survey results indicate a need to advance wheelchair technology to be more customizable to the needs of women users. Focus group data identified four major themes women commonly experience when using their assistive technology and related services: (1) usability, (2) service delivery, (3) well-being, and (4) design. Specifically, women raised concerns with customizability, the methodology to deliver and repair their wheelchair, and the need to feel empowered using their mobility aids.

Conclusion: Results of the surveys and focus groups suggest a need for assistive technology that is more inclusive based on gender, particularly with regard to females. As women become a more prominent force on and off the battlefield, it is imperative their needs be met to the same standards as men. This data allows for further design and development of technologies that address this objective as well as justify studies regarding standards of care and their effect on women veterans.

Presenter: Brandon Herbert

Agency: University of Pittsburgh Department of Medicine, Cardiology

Preceptor: Jared Magnani, MD, MSc

Heart Failure 30-day Readmissions and Food Environments in Southwestern Pennsylvania: A Multilevel Analysis

Background/Objective: Across the United States, 5.7 million people are living with heart failure and this population is becoming a larger challenge and burden to healthcare systems. Heart failure is a chronic condition where the heart cannot sufficiently pump enough blood for the body. Currently there is no cure for the disease, but patients can manage symptoms through a variety of treatments. Hospitals are evaluated heavily on how well they treat cases of heart failure, and an important marker that is used for quality of care is the rate of 30-day hospital readmissions.

Methods: The UPMC Electronic Health Record (EHR) was used to identify patients who had a primary residence within a 10-county area in Southwestern Pennsylvania (SWPA) and an admission with heart failure as the primary or secondary diagnosis from January 1, 2015 to December 31, 2017. Food retailers were identified and mapped across the 10 counties and were classified as healthy or unhealthy utilizing the North American Industry Classification System (NAICS) codes. Multilevel analysis and model building are being conducted to determine if an association exists between food environments and 30-day heart failure-related hospital readmissions.

Results: In total, 20,329 patients were admitted for incident heart failure and 2,594 (12.8%) patients were readmitted for heart failure within 30 days. The cohort has a mean age of 72.48 years, is mostly white (82.5%), and has a large proportion of patients receiving medical assistance (80.3%). Within the 10 counties, there are 771 census tracts, and 636 (82.5%) of these tracts had equal to or more than 8 patients residing within it. More than 3,200 food retailers were identified and categorized as healthy or unhealthy, and 299 (38.78%) census tracts were identified as low food access tracts. Further data analysis is ongoing.

Conclusion: The results of this study may provide new insights into the relationship between a patient's food environment near their home and likelihood for 30-day heart failure readmission following their incident diagnosis.

Presenter: Madeline Mason

Agency: Allegheny County Health Department, Pittsburgh Summer Institute

Preceptors: Kristen Mertz, MD, MPH and Lauren Brungo, MPH, BSN, RN

Allegheny County Animal Bite Report – 2018

Background/Objective: Animal bites are an important problem as they can result in injury and infection. In rare circumstances, the rabies virus can be transmitted through the saliva of an infected mammal during an animal bite. The Allegheny County Health Department (ACHD) is required to investigate animal bites to monitor animals for rabies and to make recommendations for rabies post exposure prophylaxis (PEP). The data from animal bite reports submitted in 2018 are analyzed here.

Methods: Data from bite reports were extracted from an Oracle database to an Excel file. SAS was used to remove duplicate records and obtain descriptive statistics. Population data estimates were obtained from the US census to calculate bite incidence rates per 100,000 population. ArcMapTM was used to display bite incidence rates by zip code. EpiInfoTM was used to calculate chi-square statistics comparing dog breeds involved in bites to those licensed in the county.

Results: In 2018, 1,973 bites were reported to ACHD. Dogs (74.9%) and cats (22.2%) made up majority of animals involved in bites. The most common wild animals involved were bats (0.7%) and raccoons (0.4%). Reported bites were highest during the summer months. Most bite exposures were to the upper extremities (52.0%). Age groups 25-29 years and 30-34 years had the highest bite incidence rates. Females accounted for 58.0% of bite victims. The most common bite incident types were playing with the animal, the animal got spooked, and breaking up a fight. Of 70 animals tested for rabies, 3 were positive (feral cat, bat, fox). All persons exposed to these three rabid animals received rabies PEP. Of all bite victims, 61.7% were prescribed antibiotics and 28.6% received a tetanus shot. Augmentin was the most common antibiotic prescribed to victims. Out of 103 victims that received the rabies PEP, 19.4% did so unnecessarily. Pit bulls, German Shepherds, and bulldogs were significantly overrepresented in bites.

Conclusion: Animal bites remain an important problem in Allegheny County. Wild animals remain the main threat for rabies exposure to humans. ACHD should continue to follow animal bite protocol and make proper recommendations for rabies PEP to victims.