Environmental Health

Allegheny County Health Department, Bureau of Assessment, Statistics, and Epidemiology
 Pittsburgh, Pennsylvania

<u>**Assignment Description**</u>

The Allegheny County Health Department recently received Public Health Accreditation; a strength noted by the Board was the use of data. The Bureau of Assessment Statistics and Epidemiology at the ACHDprovides data analysis for the Department and includes both Chronic Disease and Infectious Disease Epidemiology programs. All vital statistics are analyzed and reported on within the Chronic Disease Epidemiology (CDE) program. In addition to general trend reporting, there is recent increased demand for special studies, with little additional capacity for analysis and reporting. Allegheny County has recently completed an Environmental Justice report as part of our Plan for a Healthier Allegheny (or PHA, our Health Improvement Plan). We are hoping to move forward with further analysis of health outcomes susceptible to environmental conditions by conducting special studies with a CSTE fellow.

The CSTE fellow will be integrated into the CDE program. Within this program, the fellow will provide specialized work comparing health outcomes in areas of the county that need additional environmental consideration. They will have the opportunity to work with senior epidemiology staff to design and conduct health effect studies of these areas. There are three planned environmental epidemiology studies: 1 - a comparison of air pollution levels, respiratory, and cardiovascular hospitalizations before and after an industrial operation closed; 2 – conducting an analysis of risk factors (including air and water lead levels, as well as sociodemographic risks including poverty, housing condition, and race) for elevated childhood blood lead levels, potentially using geospatial statistics/regression analyses and 3 – An analysis of patterns of childhood asthma to identify areas or subgroups vulnerable to uncontrolled asthma in Allegheny County. We will collect claims data from the MCOs and clinical data from both our emergency room and hospital data systems as well as from hospitals (Children's) to best understand where asthma issues prevail by census tract, and assess what environmental and social risk factors are most strongly predictive of uncontrolled asthma using multivariable regression analyses.

1 -- Air Pollution and Hospitalization There have been numerous studies of the health effects of air pollution conducted in Allegheny County. However, there have been no opportunities to conduct a natural experiment here and few opportunities to date to assess the effects of an intervention on air pollution concentrations and associated health effects (Henschel 2012). The oft-cited sentinel study of environmental and health effect changes after an industrial plant closure is Pope (1989), who analyzed changes in hospital admissions and PM10 after a steel mill closed in Utah Valley. During the study period between April 1985 and February 1988, 24-hour PM10 levels were in excess of 150 ug/m3. While the mill was open and PM10 levels were at their highest, there was a doubling of pollution and a 3-fold increase in children's visits to the ED for respiratory issues. We are replicating this analysis around closure of the coking plant in our jurisdiction.

2 – Childhood Lead Levels Recent news coverage, locally and nationally, has increased the level of interest and concern by the public about lead contamination in our region. For decades, the Allegheny County Health Department (ACHD) has provided health education to residents on the impact of lead, particularly on young children.

Lead dust and paint chips are prevalent in houses built before 1978 when lead was eliminated from paint. Updated 5 year census estimates show that more than 80% of the county's housing stock was built before 1978 and 41% of homes were built before 1950, when lead-based paint was used more frequently. In Pittsburgh, >60% of homes were built prior to 1950. In addition, the City of Pittsburgh water supply was recently found to be out of compliance with the Lead and Copper Rule, causing some to compare lead in Pittsburgh to the lead in water issues and subsequent health effects in Flint, MI.

The ACHD has created a lead task force, and is working with other county departments, including Housing, Real Estate, Economic Development, and Water Quality, Pittsburgh Water and Sewer Authority, CountyStats, and the Universities of PIttsburgh and Chicago to conduct analyses and predictive modeling of elevated blood levels in Allegheny County.

3 – *Risks for Uncontrolled Asthma* Similarly, ACHD is creating an asthma task force to evaluate priorities for asthma mitigation in Allegheny County. Asthma has been a long-standing health concern in Allegheny County. According to our recent County Health Survey, 15.1% of AC adults report having asthma. Among those with less than a high school education, the prevalence is nearly 20%, but only 14% among those with a college degree. Among those earning over $75,000, the prevalence is 12% but among those earning less than $15,000, 26% percent of adults have asthma.

Although we understand these disparities, it is not apparent what interventions may lead to positive changes in those with asthma. Further evaluation needs to be done about management and utilization of emergency visits. In addition, there is limited knowledge about children with asthma, although there have been limited work on this population based upon school-based reports. We therefore propose to create an asthma task force to assess and gather data to better define the scope of the asthma problem in Allegheny County.

Finally, although we have recently created and published dozens of public health datasets through capacity provided by the RWJF Data Across Sectors for Health effort, ACHD is creating capacity to publish interactive dashboards of chronic disease data, including vital statistics as well as special projects (named above) to provide a more modern interface for the data consumer.

Day-to-Day Activities

1. data analysis and publication of CVD and respiratory encounters before and after plant closure
2. data analysis and publication of childhood lead outcome and risk factor data
3. working with other county agencies and academics to gather and publish cross-sector data on risks for blood lead
4. data analysis and publication of childhood lead outcome and risk factor data
5. data analysis and publication of asthma burden and risk factors in Allegheny County.
6. publish chronic disease data on Tableau interactive dashboards on our redesigned website

Potential Projects

Surveillance Activity   **Asthma surveillance**

Use PHC4 hospitalization, as well as EpiCenter ED asthma data to establish baseline prevalence of uncontrolled asthma in Allegheny County. Determine if there are geographic areas or demographic subgroups that are more likely to experience uncontrolled asthma, then work with stakeholders to propose interventions.

Surveillance Evaluation   **Cancer Incidence**

Analyze cancer incidence data and compare with cancer death data for Allegheny County. Determine differences (ratio of incidence:death) to evaluate areas or demographic subgroups of cancer screening need. Evaluate areas of greater than expected cancer incidence for environmental issues using TRI, NATA, and EJ to determine colocation. Use Tableau to publish report.

Major Project   **Natural experiment after plant closure**

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For this analysis, we will be comparing CVD and respiratory hospitalizations and ED visits during plant operations and after plant closure for the affected area. We will be conducting the same analysis with two control populations in Allegheny County, one with and one without another coking operation, to ensure that any changes noted are not due to external sources of pollution or external changes in patient care.

Additional Project   **Lead predictive modeling**

Recent news coverage, locally and nationally, has increased the level of interest and concern by the public about lead contamination in our region. For decades, the Allegheny County Health Department (ACHD) has provided health education to residents on the impact of lead, particularly on young children.

While the US Centers for Disease Control and Prevention (CDC) has indicated that no safe blood lead level in children has been identified, it is also clear from the science and available data that the greatest source of lead poisoning is the lead-based paint in houses built before 1950 that chips, peels and flakes, and becomes dust. There are also other sources of lead exposure including lead pipes and solder, and some toys and jewelry. It is important that we try to reduce lead exposure as much as possible.The major source of lead poisoning in Allegheny County and nationally is the presence of lead in paint and dust in older, dilapidated housing stock. Defective lead paint and household dust contaminated with lead account for up to 80% of elevated lead levels in US children. Lead dust and paint chips are prevalent in houses built before 1978 when lead was eliminated from paint. Updated 5 year estimates show that more than 80% of the county's housing stock was built before 1978 and 41% of homes were built before 1950, when lead-based paint was used more frequently. In Pittsburgh, >60% of homes were built prior to 1950.

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Preparedness Role

BASE works extensively with the office of EP. The CSTE fellow will have the opportunity to work with EP staff on environmental heath responses, and revisit protocols for the public health response to an environmental hazard.

Mentors

Primary	LuAnn Brink Ph.D., M.P.H. Chief Epidemiologist
Secondary	Kristen Mertz M.D., M.P.H. Medical Epidemiologist