

Applying disaster epidemiology methods to investigate potential health impacts of industry in environmental justice neighborhoods



M. Hrysko, S.K. Hooks, I.M. Karaye, B. Dixon, K.R. Kirsch, C. Strickland, J.A. Horney. Epidemiology Program, University of Delaware, Newark, DE

Purpose: Prior research in environmental justice neighborhoods shows race to be more highly correlated with toxic facility distribution than income, education, employment, or home ownership. In February 2019, a solid waste incinerator in Chester, PA began burning recyclables due in part to China's refusal to accept U.S. recyclables.

Methods: The objective of this cross-sectional study was to assess residents' perceptions of physical and mental health impacts of living near the incinerator and whether these perceptions differed by race and awareness of or distance from the facility using a modified Community Assessment for Public Health Emergency Response (CASPER). Weighted frequencies (95% CIs), Pearson Chi-Square, and mental and physical health component scores (MCS and PCS) were calculated.

Results: 181 / 210 households completed the survey (completion rate: 86%). Both MCS (Coef -5.31 (-10.08, -0.54) and PCS (Coef -3.72 (-7.58, 0.15) were lower for households living closer to the incinerator. Households closer than 3 miles, compared to those greater than 3 and less than 6 miles, were more likely to be African-American (85% v. 17% (Chi-Square=80.13; P-value=0.001)), aware of the incinerator (62% v. 40% (Chi-Square=8.67; P-value=0.003)), and perceive increased pollution since the February 2019 increase in burning recyclables (49% v. 13% (Chi-Square=13.11; P-value=0.001)).

Conclusion: This study confirms prior environmental justice research and demonstrates how disaster epidemiology methods like CASPER are modified for exploring perceptions of exposure to environmental pollution. These data can provide baseline values for the assessment of health impacts of policy changes that potentially alter the health impacts of industrial facilities.

Disparities in breast cancer stage at diagnosis between immigrant and native-born women: a meta-analysis



E. Herbach, K. Weeks, M. O'Rourke, N. Novak, M. Schweizer. University of Iowa, Iowa City, IA

Purpose: Immigrants face obstacles when seeking medical care that delay disease detection and contribute to higher breast cancer mortality despite relatively low incidence. This meta-analysis aimed to synthesize existing observational evidence to identify disparities in stage at diagnosis between immigrant and native-born women. We hypothesized that immigrant women were less likely to present with localized breast cancer compared to natives.

Methods: Systematic searches for studies detailing stage at breast cancer diagnosis by birthplace were performed in PubMed, Embase, and Web of Science. Risk of bias was assessed using the Newcastle-Ottawa Quality Assessment Scale. Pooled odds ratios were calculated with random effects models. Q and I² tests were used to assess heterogeneity.

Results: Eleven cohort studies performed in six countries were identified. Immigrant women were significantly less likely to be diagnosed with breast cancer at a localized stage than natives (pooled OR: 0.88, 95% CI: 0.82–0.95). Subgroup analyses yielded similar results within immigrants from Asia, Eastern Europe, Latin America and the Caribbean, and developing or in transition nations. Immigrants from developed countries experienced the least disparity.

Conclusion: Compared to natives, immigrant women were significantly less likely to be diagnosed with breast cancer at an early stage across studies performed in various host countries and diverse immigrant groups. The magnitude of the disparity varied by birthplace, according to region and economic condition. Future studies are needed to control for potential confounding; however, these results confirm the presence of differences in stage between immigrant and native breast cancer patients that ultimately influence survival.

Validation of a 2-item food insecurity screen among adult general medicine outpatients



C. Harrison, J. Davis, T. Smallwood, N. Begum, J. Goldstein, M. Papas. Value Institute, Christiana Care Health System, Newark, DE

Purpose: Food insecurity is defined as the limited or uncertain access to food. A 2-item screening tool derived from the USDA Household Food Insecurity Scale (HFSS) has been validated among parents of pediatric patients with the sensitivity and specificity of 97% and 83%, respectively. Our objective is to validate this screening tool in adult general medicine outpatients.

Methods: We administered the 18-item HFSS to a sample of adult general medicine outpatients. We evaluated the sensitivity and specificity of the widely used 2-item screen in this sample. Multivariable logistic regression was used to calculate convergent validity between the full HFSS tool, 2-item screen, and covariates associated with food insecurity.

Results: 224 patients were approached with 175 (78%) enrolling in this study. Of those, 15.9% (28/175) were food insecure. A confirmatory response to either of the two items from the 2-item screen had a sensitivity of 100% (28/28, CI 87–100) and a specificity of 92% (136/148, CI 86–96). Screening positive for food insecurity was associated with an increased odds for smoking and diabetes using both the 18-item HFSS tool and the 2-item screen (AOR 4.58 CI 1.60–13.07; AOR 3.29 CI 1.28–8.46) and (AOR 4.96 CI 1.62–15.18; AOR 4.05, CI 1.43–11.44) respectively.

Conclusion: We found that the widely used 2-item screen derived from the HFSS was highly sensitive and specific within adult general medicine outpatients. This is the first study to validate this tool in this population that we are aware of.

Shift work and ideal cardiovascular health among law enforcement officers



M. Shi, J.K. Gu, T. Hartley, J. Violanti, M. Andrew, D. Fekedulegn. Bioanalytics Branch, Health Effects Laboratory Division, NIOSH, CDC, Morgantown, WV

Background: Growing evidence links shift work to cardiovascular disease. Our objective was to examine whether long-term shiftwork is associated with poor cardiovascular health (CVH) among police officers.

Methods: Participants were 408 officers enrolled in the Buffalo Cardio-Metabolic Occupational Police Stress (BCOPS) study (2004–2009). Electronic work history records, from 1994 to date of examination, were used to determine the dominant shift schedule as day, afternoon, or night. CVH was assessed according to American Heart Association criteria, where four behavioral (physical activity, smoking, diet, BMI) and three clinical (blood pressure, total cholesterol, fasting glucose) factors were classified as ideal, intermediate, or poor. Total CVH is considered poor if a participant has ≤1 ideal health metrics. Log-linear models were used to compare prevalence of poor CVH across shiftwork, by estimating prevalence ratios (PRs) using the day shift as the referent category.

Results: The study sample consists of officers with mean age of 42-years (SD=8.4). The majority were men (75%), white (80%), married (75%), and patrol officers (66%). Prevalence of ideal CVH were highest for never-smokers/quit for >1-year (81%), low fasting glucose (74%), high physical activity (63%) and lowest for low cholesterol (40%), lower blood pressure (37%), low BMI (18%), proper diet (0%). The prevalence of poor CVH varied significantly across shift (day=6.7%, Afternoon=10.5%, and night=11.8%). After adjusting for age, prevalence of poor CVH was two times higher in afternoon shift officers (PR=2.41, 95%CI: 1.12–5.15) and three times higher in night shift officers (PR=3.04, 1.31–7.02), compared to day shift. Adjustment for further covariates (gender, race, and police rank) attenuated the association [night vs. day: PR=2.11 (0.82–5.43), afternoon vs. day: PR=1.67 (0.75–3.71)]. Prevalence of poor blood pressure was twice higher in night shift officers compared to day shift (PR=2.11, 1.14–3.92).

Conclusions: Poor CVH may be associated with shift work and future prospective studies are warranted.