

MODIFYING EFFECT OF THE COUNTY LEVEL HEALTH INDICES ON CARDIOPULMONARY EFFECTS ASSOCIATED WITH WILDFIRE EXPOSURE

Ana G. Rappold, US EPA
Wayne E. Cascio, US EPA
Susan L. Stone, US EPA
Vasu Kilaru, US EPA
Lucas Neas, US EPA
David Diaz-Sanchez, US EPA
Robert B. Devlin, US EPA

Background and Aims: Socioeconomic status (SES) is a known risk factor for cardiopulmonary health and some studies suggest SES may be an effect modifier for health effects associated with exposure to air pollution. We investigated the synergistic impact of health disparities on cardiopulmonary outcomes associated with the 2008 North Carolina wildfire.

Methods: A population-based study was performed using daily Emergency Department visits reported through a syndromic surveillance program. Health disparities were defined through The County Health Rankings based on composite measures of Health Outcomes (mortality, morbidity) and Health Factors (Health Behavior, Clinical Care, SES, Physical Environment). Estimates of PM_{2.5} produced by the HYSPLIT model were used to define exposure. Poisson log-linear regression was used to estimate relative risk.

Results: Significant increases in relative risk for Asthma[8.9% per 10 •g/m³ increase in two day average PM_{2.5}concentration] and heart failure (HF)[6.54%] were observed in the counties ranked below the median in Health Outcomes while no change was observed in the better ranked counties. Similarly, counties ranked below the median Health Factor Index also experienced significant increases for Asthma[9.12%] and HF[7.81%] with statistically significant risk from the better ranked counties. Both indices were independent of the exposure. A significant association was observed for COPD, pneumonia and acute bronchitis, and cardiopulmonary symptoms, but these outcomes were less numerous at the county level to be considered for interaction with health disparity measures.

Conclusions: This study suggests that health disparities may play an important role in the distribution of risk associated with exposure to emissions from wildfires. Climate related changes coupled with human land use practices are expected to increase the frequency of wildfires worldwide. The results of this study support the concern that the health burden may be shared disproportionately among the population.

This abstract of a proposed presentation does not necessarily reflect EPA policy.