

A case-control analysis of pediatric asthma prevalence and land use patterns

Asthma has been associated with numerous environmental influences including indoor and outdoor air quality as well as occupational exposures to various chemicals. This case-control study assessed potential associations between pediatric asthma prevalence and land use across Jefferson County, Alabama during 1997. Cases (n = 1,796) and controls (n = 11,926) were identified through the county health department and were 19 years of age at the time of their clinical evaluation. Study subjects were georeferenced to their residential street address and a geographic information system (GIS) assisted in quantifying land use data proximate to their residences. Land use served as a surrogate for exposure to environmental contamination and was based on a 16-category scheme including various levels of industrial, commercial, and residential applications as well as highway and agricultural uses. Following the exposure assessment, land use statistics were analyzed with factor analysis and collapsed into three primary factors. Logistic regression indicated that cases were more likely to live near areas with industrial and highway land uses (OR = 1.13; 95% CI, 1.04-1.24). A Poisson regression analysis between the frequency of case visits and the highway/industrial land use factor also revealed a significant association ($\chi^2 = 4.61$, $p = 0.03$).