Title: Outdoor Ambient Air Pollution and Uncontrolled Asthma in California

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Background: According to the 2001 California Health Interview Survey (CHIS), 11.9% of Californians (3.9 million) have been diagnosed with asthma at some point in their lives. As part of the new national initiative on environmental public health tracking, we are developing a model that links health effect data from a population-based survey to air pollution data from ambient monitors to identify geographic patterns of chronic disease and environmental hazards.

Objective: We examined the relationships between annual ambient ozone and fine particulate matter ($PM_{2.5}$) concentrations and uncontrolled asthma among CHIS 2001 respondents diagnosed with asthma residing in the San Francisco Bay Area, San Joaquin Valley, and Los Angeles County regions of California.

Methods: Using US Census Block (2000) population densities, we identified the population-weighted centroid of each zip code for CHIS respondents diagnosed with asthma, and assigned each centroid to the nearest monitoring station within a 5-mile radius. We estimated the effects of increases in ambient ozone and $PM_{2.5}$ on uncontrolled asthma in each region. Uncontrolled asthma was defined as having daily or weekly symptoms or an asthma-related emergency room visit or hospitalization within the previous year.

Results: We observed an increase in the prevalence of uncontrolled asthma associated with annual ambient ozone concentration in all three regions after adjusting for age, gender, race/ethnicity, poverty level, and health insurance status. For $PM_{2.5}$, we only observed an association with uncontrolled asthma in the San Joaquin Valley. The regional heterogeneity of the $PM_{2.5}$ effect estimates may be related to variations in the composition of $PM_{2.5}$.

Conclusion: These findings contribute to our understanding of the role of air pollutants on the control of asthma in different regions of California and underscore the importance of environmental public health tracking efforts at the state or national level.

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