

Health Impacts of Ozone in Washington, DC

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Health Impacts of Ozone

- Affects respiratory system, causes a variety of illnesses (chest pain, coughing, throat irritation, and congestion)
- Can worsen bronchitis, emphysema, and asthma
- Children, elderly, and people with lung disease more vulnerable than others
- Ill effects of ozone seen even below current standard of 75 ppb
- EPA's CASAC working on new ozone standard considering new NAAQS between 70-60 ppb

Ozone Health Impacts–Washington, DC

- Health impact studies of ozone in Washington, DC
 - Limited number of studies
 - Studies not very recent
 - Focused on high number of hospital admissions related to respiratory illnesses on certain days and corresponding ozone levels

Two Health Impact Case Studies

- Both studies undertaken by Johns Hopkins University for Washington, DC and based on data from Environmental Public Health Tracking Program established by a grant provided by US Centers for Disease Control and Prevention to DC Dept of Health
- First Case Study – Based on data period 2001-04
- Second Case Study - Based on data period 1994-2005

First Case Study

- Johns Hopkins university
 - Studied asthma-related emergency department visits and admissions for Pediatric patients in Washington, DC from 2001 through 2004 and their associations with ozone levels, socio-economic status, and age group
- Methodology
 - Daily counts of asthma-related pediatric ED visits and daily ozone concentrations during 2001-2004
 - Daily temperature, mold, and pollen measurements were also obtained
 - Regression analysis applied to the time series of daily counts for selected age groups

First Case Study

- Results
 - Significant association between pediatric asthma ED visits and outdoor ozone concentrations
 - Strongest association for the 5-12 year-old age group
 - 1 ppb increase in ozone conc indicated a mean 3.2% increase in daily ED visit and a mean 8.3% increase in daily ED admissions
 - The 1-4 yr old age group had the highest rate of asthma-related ED visits
 - For 1-17 yr olds, the rates of both asthma-related ED visits and admissions increased logarithmically with the percentage of children living below the poverty threshold

First Case Study

- Conclusion
 - Significant associations between ozone conc and asthma-related ED visits, especially for 5-12 year olds
 - The result that the most significant ozone associations were not seen in the age group (1-4 yrs) with the highest rate of asthma-related ED visits may be related to the clinical difficulty in accurately diagnosing asthma among this age group
 - Real increases in relative risk of asthma ED visits for children living in higher poverty zip codes versus other zip codes

Second Case Study

- Johns Hopkins university
 - Studied asthma-related acute care visits for Medicaid patients and their associations with ozone levels in Washington, DC using data from 1994 through 2005
 - Identified regions and populations that may experience increased asthma exacerbations related to air quality

Second Case Study

- Results
 - Significant associations between asthma-related general acute care visits and ozone concentrations
 - Significant associations with ozone conc observed for 5-12 year-olds
 - High ozone conc closely associated with asthma exacerbations observed in acute care visits in areas with high Medicaid enrollment

Summary

- Significant associations between asthma-related general acute care visits and ozone concentrations
- Significant associations with ozone conc observed for 5-12 year-olds
- High ozone conc closely associated with asthma exacerbations observed in acute care visits in areas with high Medicaid enrollment and poverty