Association Between Exposure to Traffic-Related Air Pollution and Adverse Health Effects in Adults

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Air Resources Board
California Environmental Protection Agency
Asthma

- Chronic respiratory disease
- Scope of problem in California
  - 9% of adults have active asthma
  - 500 deaths and 16,000 hospital admissions per year
- Air pollution and asthma
  - Traffic-related air pollutants including PM, SO$_2$, NO$_X$, and O$_3$ are associated with asthma attacks and worsening of symptoms
Impacts of Traffic Exposure on Poorly Controlled Asthma: Study Design

- Poorly controlled asthma
  - Symptoms at least weekly, or
  - Hospitalized for asthma during the past year
- 1,600 adults with asthma in Los Angeles and San Diego Counties

Traffic-Associated Increases in Poorly Controlled Asthma in Adults

Increase in Risk

- Elderly Asthmatics (65 years & older)
- Other Asthmatics (18-64 years)

- Medium Traffic
- High Traffic
## Other Traffic-Related Health Effects in Adults

<table>
<thead>
<tr>
<th>Health Effects</th>
<th>Short-term Exposure</th>
<th>Long-term Exposure</th>
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<tbody>
<tr>
<td>Death from cardiovascular causes</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Death from respiratory causes</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Hospital admissions</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Atherosclerosis</td>
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<td>X</td>
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<td>Lung and breast cancer</td>
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<td>X</td>
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</tbody>
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Trends in Emissions of Traffic-Related Pollutants

Year

Relative Change in Emissions


Diesel PM

NO_x

SO_x

TOG

CO
Current ARB Research Studies on Traffic and Health

- Cardiovascular effects in seniors during freeway travel
- Air pollution and heart disease among California teachers
- Toxicity of PM from heavy and light-duty vehicles
- Respiratory effects among bicycle commuters
- Traffic-related pollution and deaths
- Traffic, socioeconomic status, and asthma
Conclusions

- Traffic-related air pollution is associated with increased risk of disease and death
  - 1 million Californians live within 100 meters of a freeway
  - ~50% of Californians live within 1 mile of a freeway

- Land use guidelines need to be taken into account