Air Pollution and Public Health

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Air Pollution has a Compelling History

Donora – 1948
London – 1952
New York City – 1966
Birmingham – 1972
Los Angeles – 1988
Atlanta – 1996

Events of health consequence and nagging health adversities
...The Recovery is also Compelling

A new era for cities – places to live, work and play
A Good News Story…

Comparison of Growth Areas and Emissions, 1970-2015

- Gross Domestic Product: +246%
- Vehicle Miles Traveled: +184%
- Population: +57%
- Energy Consumption: +44%
- CO₂ Emissions: +28%
- Aggregate Emissions (Six Common Pollutants): -71%
PM Trends

PM2.5 Air Quality, 2000 - 2015
(Seasonally-Weighted Annual Average)
National Trend based on 480 Sites

MAPshow2.png

PM10 Air Quality, 1990 - 2015
(Annual 2nd Maximum 24-Hour Average)
National Trend based on 171 Sites

Across 35 Major Cities
Number of Days Exceeding the AQI for Sensitive Groups

Los Angeles Long Beach - AQI

Ozone

Data Source: Preliminary air quality data as reported to EPA's Air Quality System and AirNow.gov

2000 to 2015: 37% decrease in National Average

1990 to 2015: 39% decrease in National Average
### Summary of National PM$_{2.5}$ impacts due to 2005 air quality

<table>
<thead>
<tr>
<th>Excess mortalities (adults)$^A$</th>
<th>130 to 320,000</th>
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<tbody>
<tr>
<td>Percentage of all deaths due to PM$_{2.5}$$^B$</td>
<td>5.4%</td>
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### Impacts among Children

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number (1,000s)</th>
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<tbody>
<tr>
<td>ER visits for asthma (&lt;18 yr)</td>
<td>110,000</td>
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<tr>
<td>Acute bronchitis (age 8-12)</td>
<td>200,000</td>
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<tr>
<td>Exacerbation of asthma (age 6-18)</td>
<td>2,500,000</td>
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$^A$ Range reflects use of alternate PM mortality estimates

$^B$ Population-weighted value using Krewski et al. (2009) PM mortality estimates
Some Issues are of National Concern

- The United States spends more than $1 billion every year to fight wildfires
- According to National Interagency Fire Center data, of the 10 years with the largest acreage burned, nine have occurred since 2000 (as of 2012)
- NEI: ~38% of the 2014 PM$_{2.5}$ annual avg. resulted from wildland fires
Transportation sources can be of particular concern because of ubiquitous use and people come into close contact with vehicle emissions on a daily basis.

Studies show that children and adults living, working and going to school near highways and large transportation facilities face increased health risks:

- Asthma and other respiratory diseases
- Cardiovascular effects
- Birth and developmental effects
- Premature Mortality
- Cancer
Today’s Goal

• The protection and improvement of public health is one that is more than regulation
• To achieve this goal, a more proactive role is needed in outreach and communication working with the public health community and the public at large bringing information and tools to empower the public and when possible provide insights for intervention.

• U.S. Air Quality Index New Communication Tools – Susan Stone (EPA/OAQPS)
• Wildland Fire Smoke and Public Health – Ana Rappold (EPA/ORD)
• Environmental and Public Health Air Pollution and the Healthcare System – Wayne Cascio (EPA/ORD)
• Pilot Study on Maternal Exposure to Traffic-related PM2.5 Air Pollution – Joe Ziestman (Texas A&M Transportation Institute)