

Short-term PM_{2.5} Exposure and Acute Heart Disease Events

July 26, 2007



California Air Resources Board

California Environmental Protection Agency

Previous Results for PM2.5

- Long-term exposure
 - Atherosclerosis
 - Heart disease
 - Premature death
- Short-term exposure
 - Atherosclerosis complications
 - Premature death
- Do short-term exposures contribute to heart attacks and other coronary events?

Study Design

- Wasatch Front, Utah (1994-2004)
- 12,865 patients with diagnosed coronary artery disease
- Endpoints:
 - Unstable heart associated chest pain
 - Stable heart associated chest pain
 - Initial heart attack
 - Subsequent heart attack
- Information on age, smoking, diabetes, body mass index, blood pressure and family history of early coronary disease

Results

- 4.5% increased risk of coronary events for each 10 $\mu\text{g}/\text{m}^3$ increase in PM2.5
- Greatest risk with same day or average of previous 2 days exposure
- Higher risk with unstable heart disease
- More effects in patients with severe coronary artery disease

Implications

- PM2.5 controls can reduce heart attacks in California
 - Significant PM2.5 exposures in California
 - South Coast and San Joaquin Valley Air Basins had 48 and 57 days above the standard in 2006
- Supports need for continued progress toward attaining national 24-hour PM2.5 standard of $35 \mu\text{g}/\text{m}^3$