What studies are appropriate to use to estimate health impacts from specific sources such as diesel PM?

CARB Symposium: Estimating Premature Deaths from Long-term Exposure to PM$_{2.5}$

February 26, 2010

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Types of Studies Available

- **Animal Studies (e.g., mice exposures to diesel emissions)**
  - Advantages:
    - Controlled Conditions, Specific to Diesel pollution
  - Disadvantages:
    - Not realistic exposure mix and species extrapolation required

- **Occupational Studies (e.g., of toll workers)**
  - Advantages:
    - Human populations in real pollution mixes
  - Disadvantages:
    - “Healthy worker” effect, very high exposures

- **Epidemiological Studies (e.g., of general population)**
  - Advantages:
    - Real people, real exposure situations, including susceptibles
  - Disadvantages:
    - Hard to differentiate diesel-specific effects from other pollution
Options when Using Observational Epidemiology

- **Proximity to Roadway Studies**
  - **Advantages:**
    - Real populations with large diesel exposures
  - **Disadvantages:**
    - Not clear how much diesel vs. other, possible SES confounding

- **Epidemiology Studies of Particulate Matter**
  - **Advantages:**
    - Many studies, representative exposures and populations
  - **Disadvantages:**
    - Assumes that diesel particles of similar toxicity to all PM$_{2.5}$.

- **Epid. Studies of PM Components (e.g., by constituent or source)**
  - **Advantages:**
    - Yields results more specific to diesel PM
  - **Disadvantages:**
    - Few studies available considering PM$_{2.5}$ components.