EFFECTS OF AIR POLLUTION ON BIRTH OUTCOMES

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Turning Data into Action
Community Strategy Conference:
Paying the Price with our Health
1. Environmental exposures in pregnancy – why important?
2. Air pollution and birth outcomes
   • Environment and Pregnancy Outcomes Study (premature birth)
   • Air Toxics Study (low birth weight)
Why pregnancy exposures are important

- Prematurity/low birth weight
  - Infant mortality
- Children’s health
  - Asthma
  - Autism
- Adult health
  - Heart disease
  - Diabetes
Los Angeles County

- 150,000 births/year
- Traffic pollution
- Air pollution monitoring data
Timing of exposure

- 1st trimester – placenta formation
- 3rd trimester – fetal weight gain
The Environment and Pregnancy Outcomes Study

- LA County mothers who gave birth in 2003
- Cases = premature babies (<37 weeks)
- Controls = full-term normal weight babies
- 2,543 mothers surveyed
  - Smoking
  - Second-hand smoke
  - Occupation
  - Socio-economic status
- Exposures: monitoring station data

Citation: Ritz B, Wilhelm M, Hoggatt KJ, Ghosh JK. American Journal of Epidemiology. 2007 Nov 1;166(9):1045-52.
Air pollution and premature birth

- **1st trimester** exposures important
  - Carbon Monoxide (CO) $\rightarrow$ 20-25% increased risk
  - Fine Particulate Matter (PM$_{2.5}$) $\rightarrow$ 10-29% increased risk

- Could anything else explain what we saw?
  - age
  - race/ethnicity
  - education
  - parity
  - smoking
  - second-hand smoke
  - health insurance
Air Toxics

- Polycyclic aromatic hydrocarbons (PAHs)
- Benzene
- Vanadium
  - Diesel
  - Shipping industry
Air Toxics Study: traffic exposures map

Legend

NO₂ concentration (ppb)

- 6.79 - 15.82
- 15.93 - 19.34
- 19.35 - 22.38
- 22.39 - 25.24
- 25.25 - 28.28
- 28.29 - 31.89
- 31.9 - 37.41
- 37.42 - 55.28

Boyle Heights

Los Angeles

Long Beach
Air Toxics Study: results

**Term Low Birth Weight**

- 3rd trimester exposures important
- Increased risk with:
  - Polycyclic aromatic hydrocarbons
  - Benzene
  - Traffic
- For North Long Beach:
  - Vanadium
Summary

• Traffic related air pollution increases risk of:
  • Prematurity
  • Low weight babies
• Specific air pollutants
• Exposures vary by:
  • Timing of pregnancy
  • Where mother lives
THANK YOU!
ADDITIONAL SLIDES
Air Toxics Study

- Exposures:
  - Air toxics
  - Traffic pollution map

- LA County births 1995-2006 (n=379,103)
- Cases: full-term low weight babies (<5.5lb)
- Controls: full-term normal weight babies

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