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(Lancet Medical Journal - September 2, 2000)

- ~6% of all deaths from PM10
- ~40,000 deaths per year in Austria, France, Switzerland; 2 times traffic fatalities
- Motor Vehicles Responsible For ~50%
- People in Cities Die ~18Months Earlier Than They Otherwise Would
- Over 300,000 cases of chronic bronchitis; 500,000 asthma attacks; 16 million lost person days of activity
- Health Costs From Traffic Pollution ~1.7% of total GDP
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Preliminary Results: Association between

Assessing Diesel Cancer Risk

- In general, some 30 studies of effects on workers have provided best data
- Consistent small (20-40%) increase in lung cancer associated with exposure
- Some questions about each study
- It is a challenge to quantify the risk



Air Toxics Health Effects

■ Benzene

- a "known human carcinogen"
- studies in U.S., and Chinese workers have shown link between exposure and increased leukemia
- levels of exposure a function of how much benzene in the fuel

■ 1,3 Butadiene

- a "probable human carcinogen
- studies in laboratory animals and US and Czech workers have shown effects
- a product of combustion
- vehicles the major environmental source

Air Toxics Health Effects II

Aldehydes

- Many different aldehydes (acetaldehyde, formaldehyde, others)
- emitted from vehicles and other sources; also formed in the air
- most are probable human carcinogens
- also can be nose and respiratory irritants

Methanol

- can be used as alternate fuel, additive
- fatal at high levels of ingestion
- some risk of misuse
- does not appear to have serious health effects at lower inhaled levels

















Global Trends in the Total Vehicle Population (Excluding Motorcycles)

Health Impact of Air Pollution in Asian Cities

- Motor vehicle pollution, a serious cause of lung disease and breathing disorders in Asian cities;
- In Delhi about 10,000 premature deaths due to air pollution in Delhi and hundreds of thousands of cases of respiratory illnesses;
- In Thailand Bangkok has higher incidence of pollution-related respiratory diseases --19%, compared to secondary cities with lower air pollution levels--8%.

Conclusions

- Vehicle Related Air Pollution Problems Cause Serious Adverse Effects Including Premature Death
- Pollution Controls on Vehicles & Cleaner Fuels Have Led To Much Cleaner Air in Many Places
- Continued Growth Offsetting Some Gains
- Even Tighter Controls Being Introduced
- Challenge Is To Get State of the Art Controls Wherever Needed

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