

Exposure and Health of
Workers involved in the World
Trade Center Clean Up Effort

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Key Issues Being Investigated

WTC Clean Up Worker Exposure And Health

- Worker Exposure to Airborne Contaminants
 - asbestos
 - particulate matter
 - volatile organic compounds
 - metals
- Worker Respiratory Health Effects
 - acute effects
 - chronic effects

Research Conducted to Date

Airborne contaminants monitored at Ground Zero

- Ground Zero Area Concentrations
 - 5 locations including the Pile October 01
 - 4 locations including the Pit April 02
- Truck Driver Personal Exposures
 - 54 truck drivers in October 01
 - 13 truck drivers in April 02

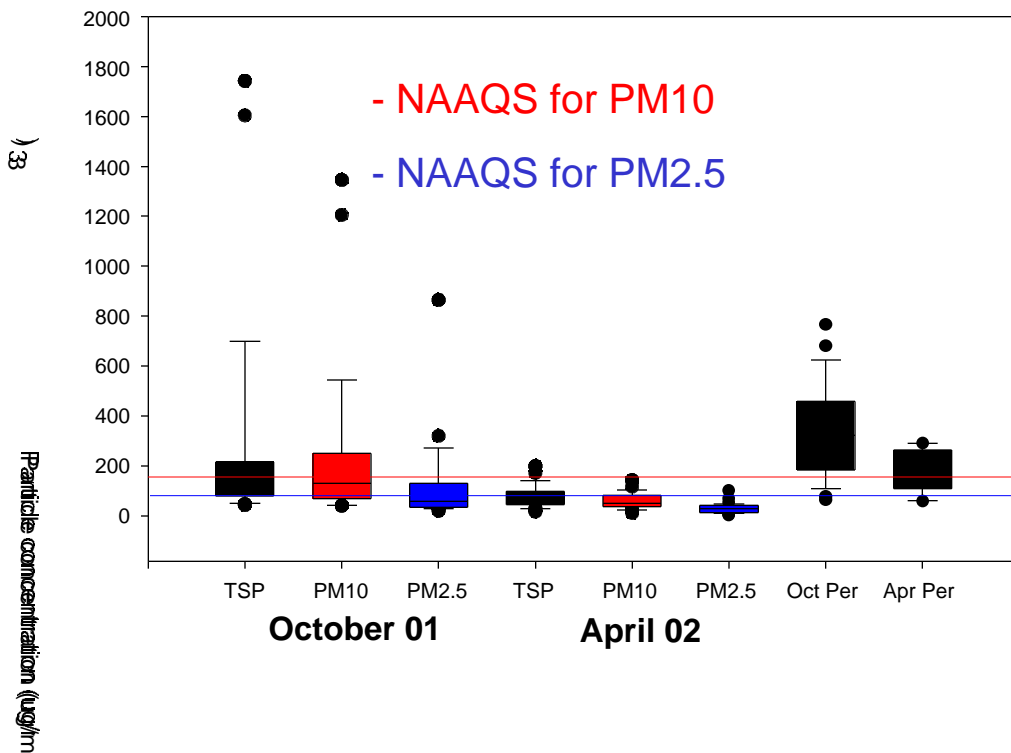
Research Conducted to Date

Respiratory Health Studies

- **Respiratory Symptoms Health Survey Evaluated:**
 - 183 workers including truck drivers, heavy equipment operators, laborers, carpenters, and dock builders
 - current and former cough, wheeze, phlegm
 - current sore throat, stuffy nose, blowing nose, hoarseness, laryngitis
 - history of pulmonary disease
 - smoking history
 - respiratory use
- **Lung Function (Ability to Exhale) Testing Included:**
 - 175 workers tested
 - FEV₁, FVC, FEV₁/FVC

Results to Date

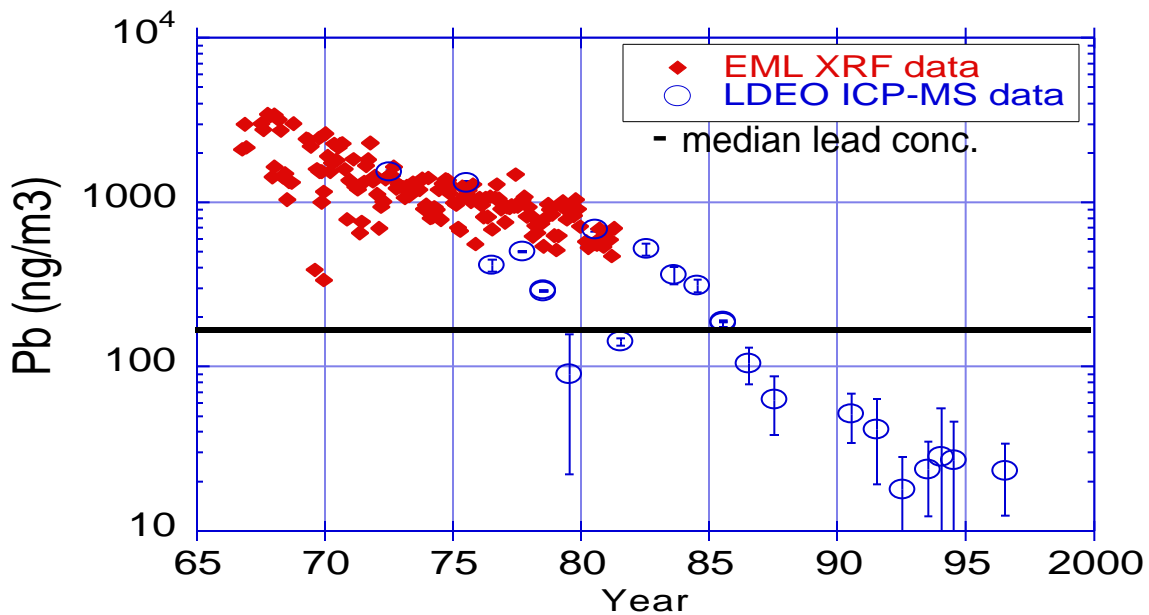
Ground Zero Particle Concentrations were Often Above Legal Limits for the Public



Results to Date

WTC Airborne Lead (Pb) Levels Were Increased, but Comparable to Historical NYC Levels When Leaded Gas Was Used

Pb in TSP collected in New York City
Monthly composites of weekly samples



Chillrud et al. 2002

Results to Date

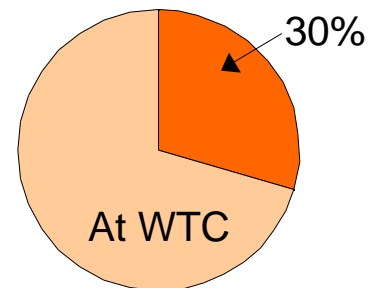
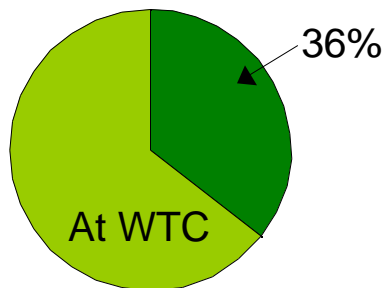
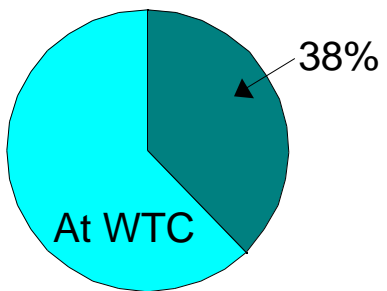
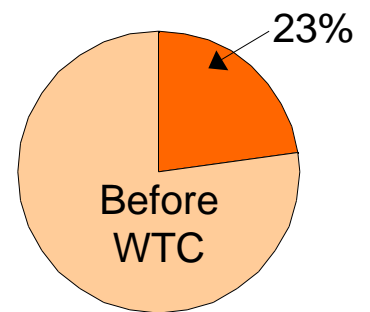
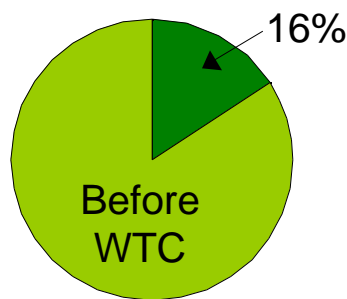
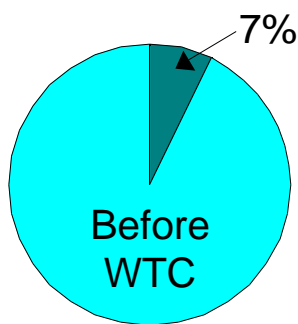
On Site Personal Airborne Asbestos Measurements Indicate Low Levels

Dates	N	Mean (range)	Total No. Structures	Total No. Structures >5 um	No. <LOD
10/1-10/7/01	12	0.01 (0.003 – 0.101)	30*	3	3
10/17-10/26/01	19	0.03 (0.013 – 0.083)	22*	0	9
4/13-4/23/02	14	0.015 (0.006 – 0.04)	21**	0	5

* all structures chrysotile

** one structure amosite, 20 structures chrysotile

Lung Symptoms Increased after 9/11



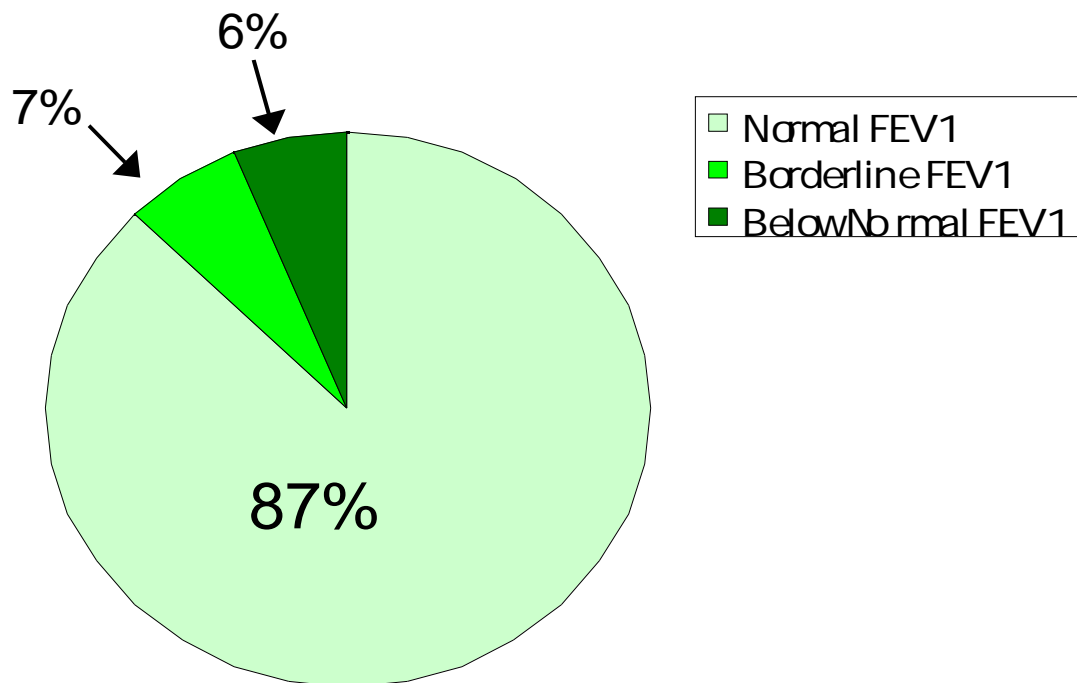
Cough

Phlegm

Wheeze

- Workers reported more symptoms **since beginning** work at the WTC site as compared to **before beginning** at the site.

But Only a Small Percentage Had Below-Normal Lung Function



Conclusions

WTC Clean Up Worker Exposure and Health

- Exposure to particles was significantly elevated in the early months, but decreased as the site was cleared
- Exposure to airborne asbestos concentrations was low, and was as very small fibers over the entire clean up effort
- Lead levels were elevated, but equivalent to those found in NYC during the 1980's
- There was an elevation in respiratory symptoms since working at site.
- Symptom rates were at the high end of those reported in other working populations exposed to dusty environments.
- Lung function testing demonstrated that only a small percentage of these workers are experiencing impairment of lung function.

Future Plans

WTC Clean Up Worker Health Surveillance

- Development of a Registry of workers involved in the clean up effort
- A Survey worker health status by self administered questionnaire
- The identification of workers still in need of immediate health care