



Lessons from New Orleans on the role of environment in children's health disparities (Evolving from reactive to proactive medicine)

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- Louisiana Education Quality Support Fund-Xavier University
- Agency for Toxic Substance and Disease Registry-Xavier University
- Department of Housing and Urban Development-Xavier & Tulane
- Greater New Orleans Foundation Environment Fund-Tulane

"The right to search for truth implies also a duty; one must not conceal any part of what one has recognized to be true."



Albert Einstein  
 Base of his monument at the National Academy of Sciences, Washington, D.C.

**Purpose: Overview of lessons learned about lead**

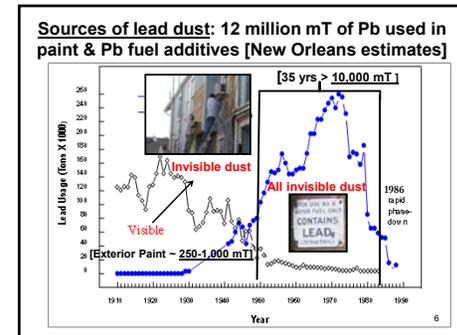
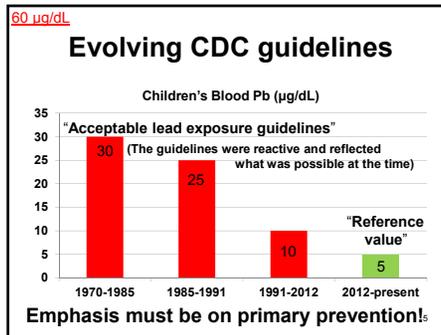
- Reactive medicine & accepted Pb guidelines;
- The major sources of lead dust;
- Lead standards & margins of safety;
- New Orleans evidence of lead exposure related health effects and disparities;
- Proactive medicine; federal, city, other actions to prevent lead dust exposure in New Orleans.

**Reactive, downstream medical approach to lead**  
 Children were used as a lead dust detection system

Is there an acceptable level of Pb exposure? CDC



**NO KNOWN SAFE LEVEL OF LEAD EXPOSURE!**



**U.S. emphasis on household & paint**

The Cochrane Collaboration: Household interventions for preventing domestic lead exposure in children—The Cochrane Library 2012, Issue 4.

*Yeoh, Woolfenden, Lanphear, Ridley, Livingstone*

This review of 14 studies found that educational and household dust control interventions **are not effective** in reducing blood lead levels of young children.

**Additional source: Traffic as a lead dust delivery system.**

6 micrograms Total Tolerable Daily Intake for children  
 1 gram = 1,000,000 micrograms  
 Example of one gram:



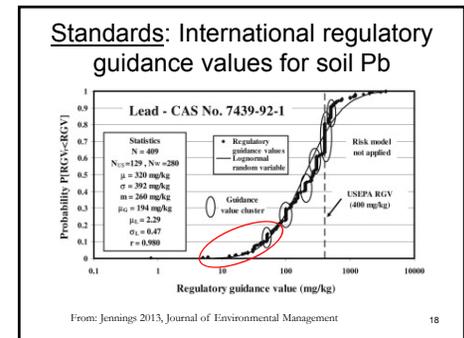
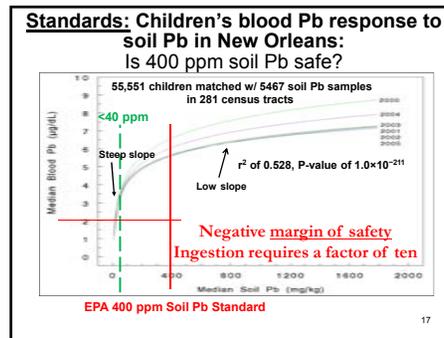
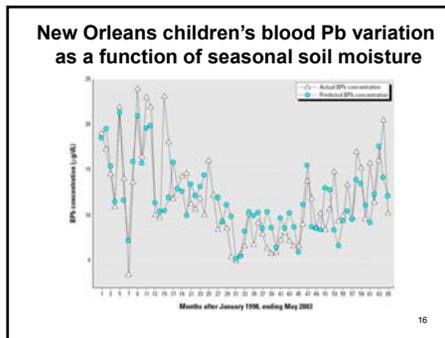
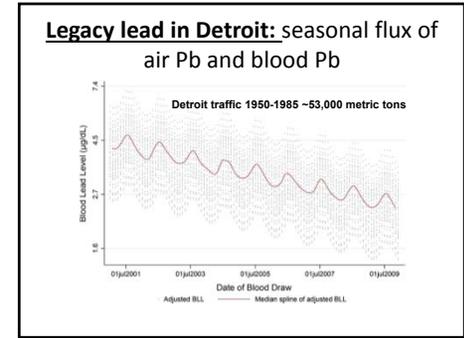
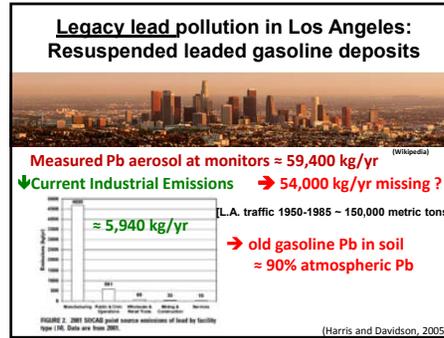
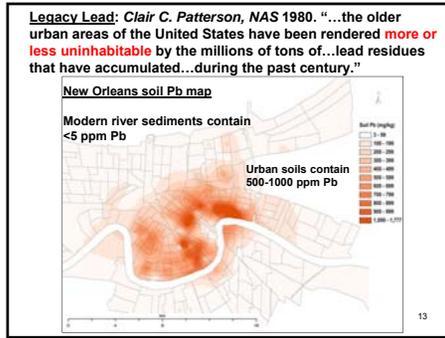
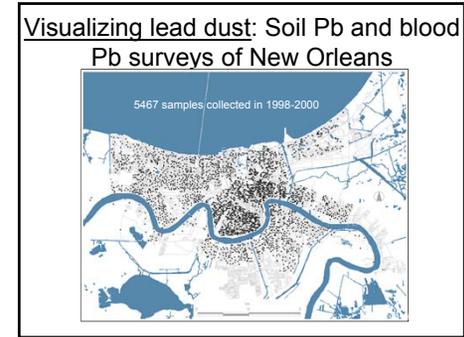
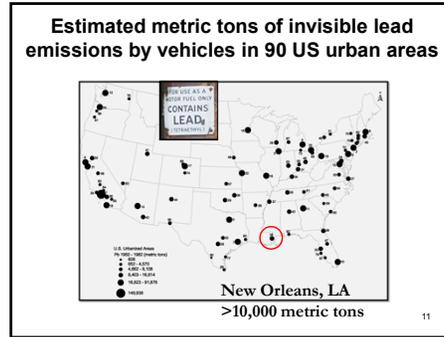
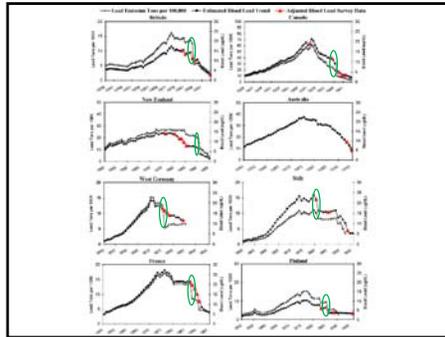
In the 1960's and 70's a gallon of gas contained 2 g TEL  
 One car had ~ 20 gallons or 40 g TEL (40 million µg)  
**New Orleans vehicles >10,000 metric tons of Pb dust**

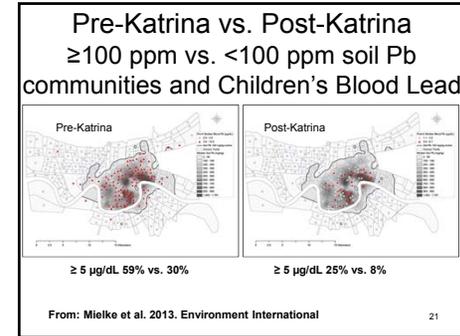
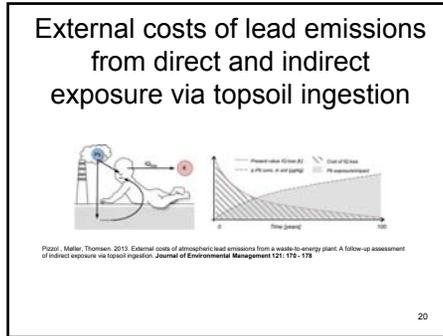
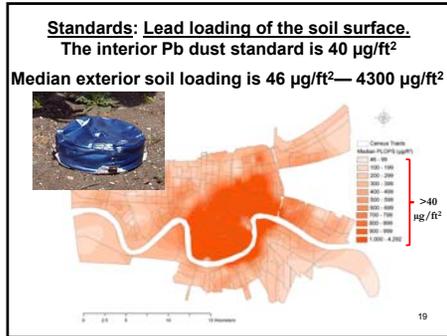
**Airborne Lead Reduction Act of 1984**

Minnesota Legislature petitioned Congress to ban leaded gasoline. U.S. Senate hearings—June 22, 1984

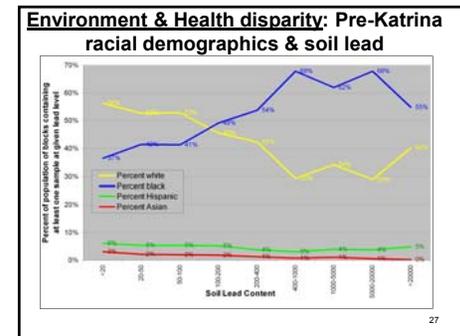
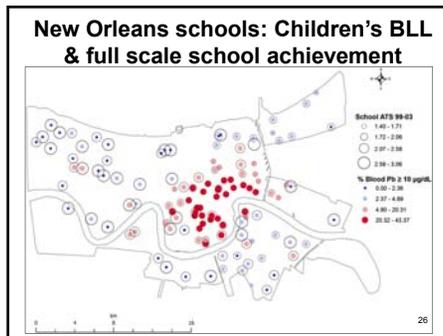
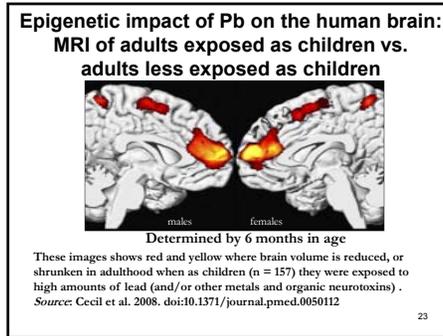


Thank you for your help with your bill. Al Franken





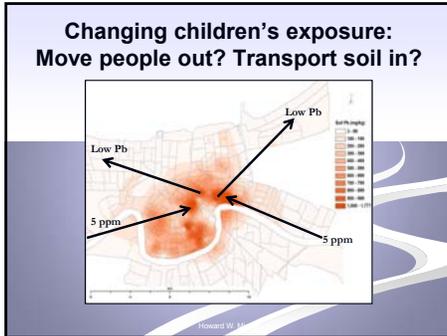
- Review: Very low Pb exposure linked to many medical issues including:**
- Irreversible fetal **brain** damage
  - **Learning** disabilities (>2 µg/dL) \$
  - **Hearing** problems
  - **Violence** \$
  - **Alzheimer's** disease \$
  - **Schizophrenia** in the era of leaded gas (Oakland study)
  - **Hypertension** \$
  - **All cause and cardiovascular mortality** at ≥ 2 µg/dL \$
  - **Increased cataracts**
  - **Chronic kidney disease & dialysis** \$
  - **Diabetes** (2004 *Environ Health Perspect* 112:1178-82) \$
  - **Impaired bone synthesis & Osteoporosis** \$
- Ref: U.S. DHHS NTP, 2012, *Monograph on the health effects of low-level lead*  
**Avoided \$\$\$\$\$\$ costs: opportunities & challenges** 22



**Proactive, upstream medicine—Change environment to prevent Pb dust exposure**



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**Comparative costs of environmental interventions**

Type of project	\$US Cost per ft <sup>2</sup>	Time to completion
Dig and haul	\$36	Days
Oakland fish bone project—P to form of Pb pyromorphite	\$18	Years
Concrete	\$3-10	Days
Asphalt	\$1-5	Days
Geotextile cover & soil emplacement	\$2	Hours

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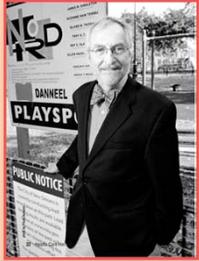
**Lead-safe play area interventions: Geotextile + 6 inches(15 cm) soil <5 ppm Pb. GNOF & HUD funded projects**



Initial play soil Pb ~750 ppm; within hours the soil Pb was <5 ppm  
1 time cost ~ \$100/child

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**Soil intervention of New Orleans parks and play areas**



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- Conclusions: Lessons about lead in New Orleans**
- **NO safe lead exposure!**—reactive medicine;
  - **Lead additives in gas** were a major source of **lead dust** accumulation in cities;
  - **Standards are inadequate** to protect children;
  - **Health outcomes include** violence, learning, and other lead-exposure related disparity issues;
  - **Proactive medicine: federal, city and private efforts** to curtail exposure in New Orleans
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**Science and Policy to Protect Future Generations?**  
Children should be able to suck their fingers and mouth their toys without poisoning themselves with Pb dust!



Children are programmed by their genes—**Environmental intervention must be done to achieve lead-safety for children.**

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