
Demolition and Lead Dust

Dave Jacobs, PhD

National Center for Healthy Housing

University of Illinois at Chicago

Lead in Children's Products



ASPINALL'S ENAMEL

SURPASSES ALL OTHERS.
AVOID IMITATIONS.



THE FINEST COLORS
IN THE WORLD

1837



SIXTY YEARS
EVOLUTION
IN DECORATIVE
ART

IS NOT MADE
WITH LEAD AND IS
NON POISONOUS



COLOURS
PERFECT

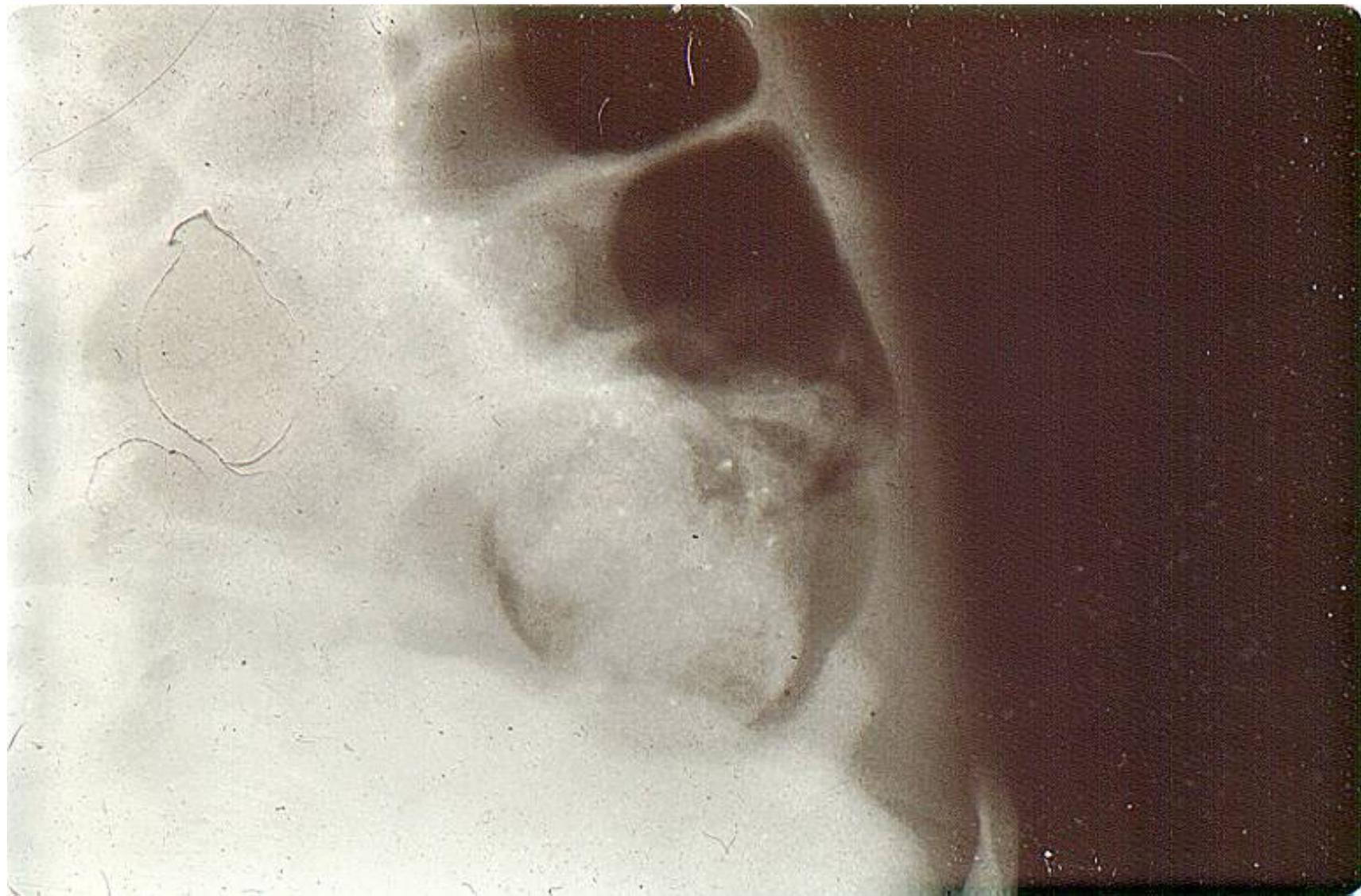
1897

PARIS, 24 RUE ALIBERT

NEW CROSS LONDON, S.E.

NEW YORK, 98/100 BERKMAN

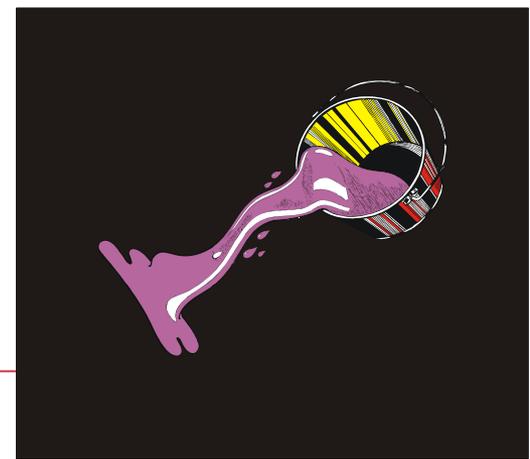




LEAD EXPOSURE LINKED TO:

- Reduced IQ
- Reading & Learning Disabilities
- Hearing Problems
- Reduced Height
- Kidney & Hematopoietic System Disease
- Probable Human Carcinogen
- Seizures, Coma, Death
- Juvenile Delinquency & Crime

Some Effects Are Irreversible (2 reasons)



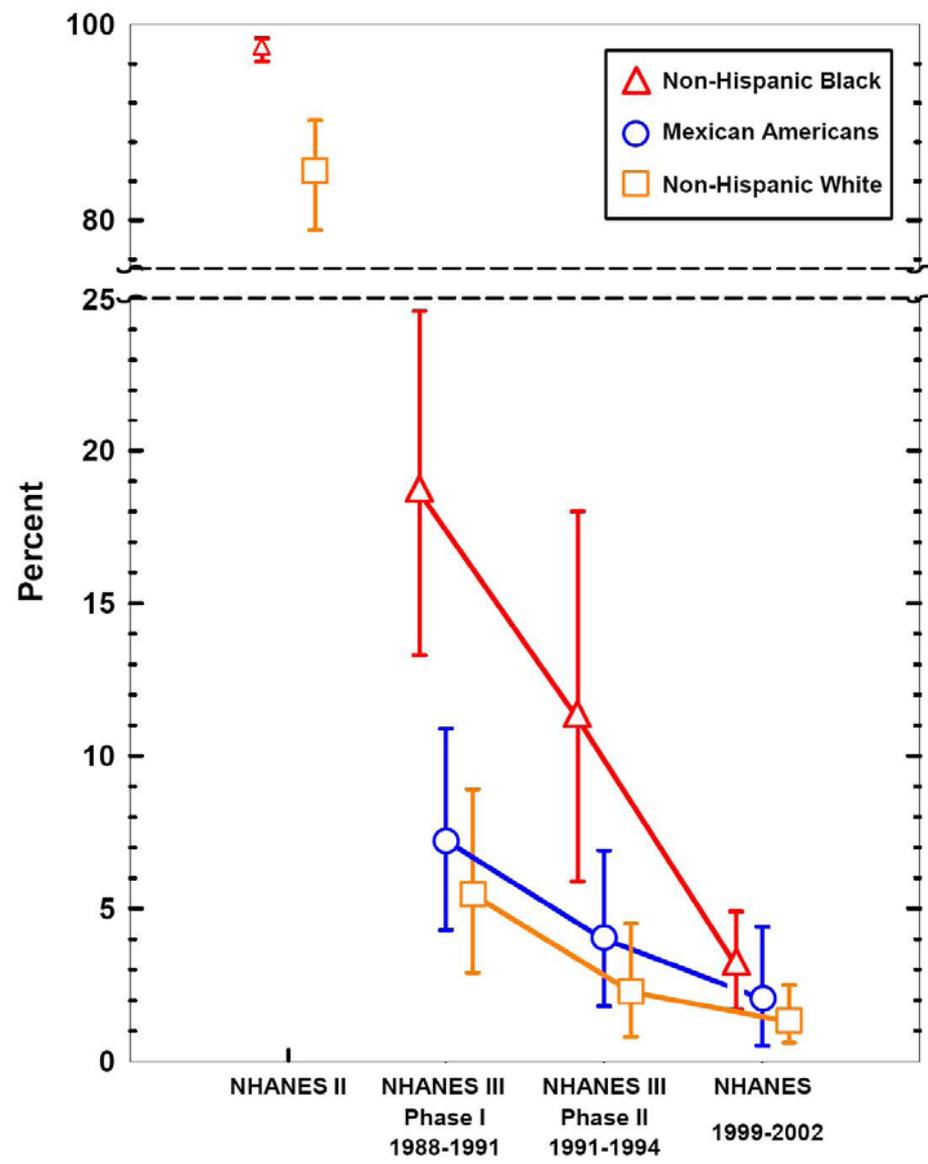
Number of Lead Poisoned Children



- **Late 1970's** **3-4 Million**
- **Late 1980's** **1.7 Million**
- **Mid 1990's** **890,000**
- **1999-2002** **310,000**

Source: Centers for Disease Control and Prevention

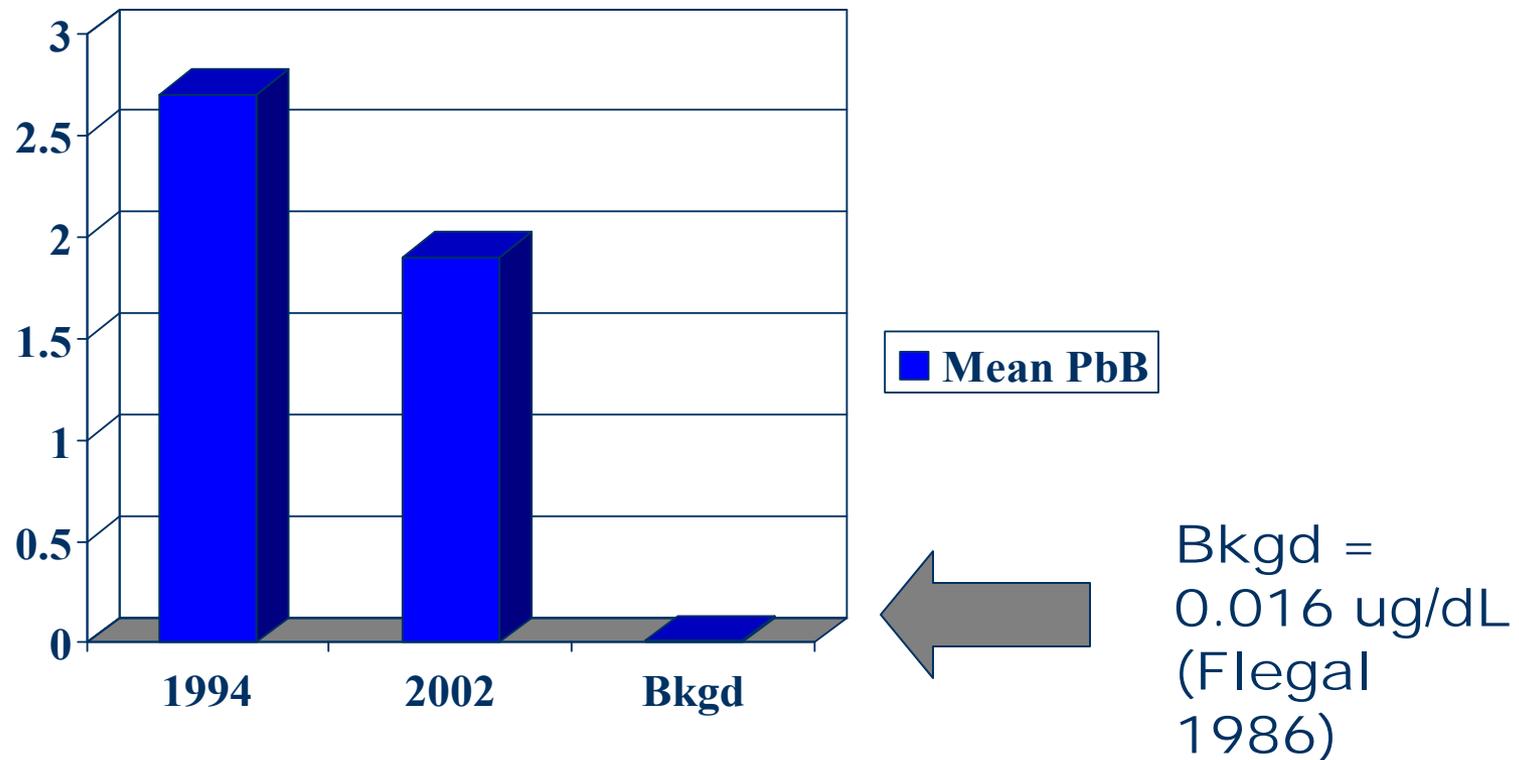
Percent of U.S. Children Aged 1-5 Years with Blood Lead Levels $\geq 10 \mu\text{g/dL}$, with 95% Confidence Intervals, NHANES II, NHANES III Phases 1 and 2, and NHANES 1999-2002



Has the Lead Problem
Already Been Solved?



Childhood Blood Lead Is Still More than 100 Times Above “Natural” Levels



How Much Lead Paint Is Left?

- 7.5 billion square feet interior
- 29.2 billion square feet exterior
- Total = **36.7 billion square feet**
- Enough to coat the entire city of Chicago with 4 layers

Source: HUD National Survey of Lead and Allergens,
2000

European Countries That Signed the ILO Ban on Lead Paint (by 1927)

- Austria
 - Belgium
 - Bulgaria
 - Czechoslovakia
 - Estonia
 - France
 - Great Britain
 - Greece
 - Latvia
 - Poland
 - Romania
 - Spain
 - Sweden
 - US Ban - 1978
-
-



THE SUN



Wednesday, March 20, 2002

Baltimore, Maryland

50 cents

INSIDE

O's rotation rounds
into shape with **Maduro**
likely to get No. 5 spot

Calvin Maduro appears to win the last spot in the Orioles' rotation when the team options Rick Bauer and Sean Dougllass to Triple-A Rochester. Maduro would join starting pitchers Scott Erickson, Jason Johnson, Sidney Ponson and Josh Towers. [Page 18]

Nation/World

Campaign finance vote likely today in Senate. [Page 3A]

Acting Mass. governor drops out of race. [Page 11A]

Opposition leader backs Zuhairi strike. [Page 16A]

Opinion

Lead paint is old, but it's not history

■ **Poison:** A poignant case shows that city and state efforts to rid rental housing of lead paint are not protecting all children.

By HEATHER DEWAR
SUN STAFF

When his family moved into their rented rowhouse in Northeast Baltimore last June, Cameron Roberts was

an active 1-year-old with a ready smile and a two-word vocabulary: "Mama" and "no."

Five months later, he lay in the intensive care ward at Kennedy Krieger Institute with a potentially lethal dose of lead in his bloodstream — poisoned, his family now believes, by dust and flakes from the lead-based paint that riddled his home.

A month's worth of painful injections probably saved the toddler's life, doctors say. But the lead, which lingers in

his system, left him in danger of lifelong difficulties with learning and behavior.

Now 21 months old, the dark-eyed child still speaks only two words. He rarely smiles.

"It breaks my heart," said Cameron's grandmother, Sonia Johnson of West Baltimore. "He screams, he falls out, he bangs his head against the floor. He's a sweet little child, but he just goes through changes, and you can see it's not his fault."

Tragedies like this aren't



KENNETH K. LAM: SUN STAFF

Forever changed: Medical treatment saved Cameron Roberts from death, but the lead damage cannot be reversed.

supposed to happen in Baltimore anymore.

Two years ago, city, state and federal officials launched a concerted campaign to end the childhood lead poisoning

that has been a scourge on Baltimore since the 1800s. They pledged to strengthen law enforcement and help landlords clean up the toxic lead paint. [See *Lead*, 12A]

Cheney coaxes Arafat effort

U.S. offers meeting if Palestinian leader acts to end violence



Paint chips poison Millie

President Bush said Thursday that his popular dog, Millie, is sick with lead poisoning after eating flecks of old paint during remodeling at the White House. It was not clear whether the dog's life is in danger.





DUST





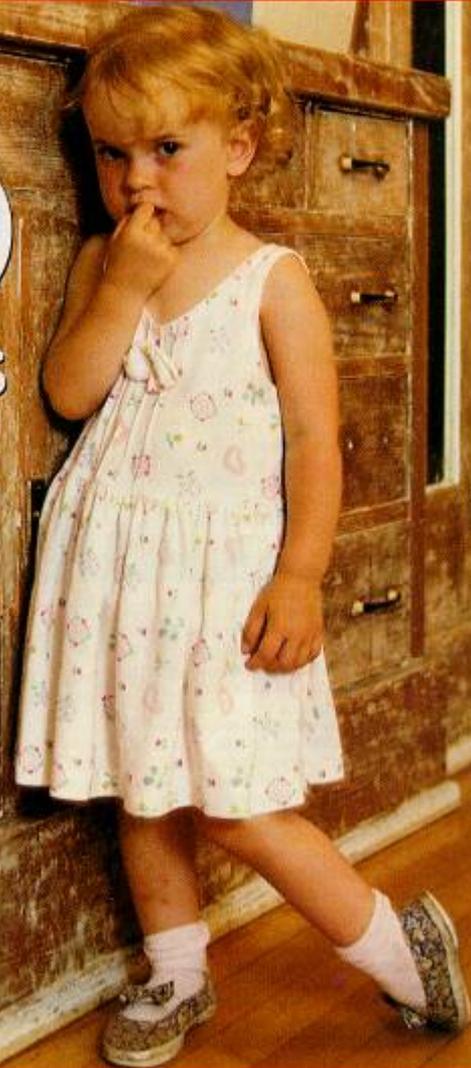
Newsweek

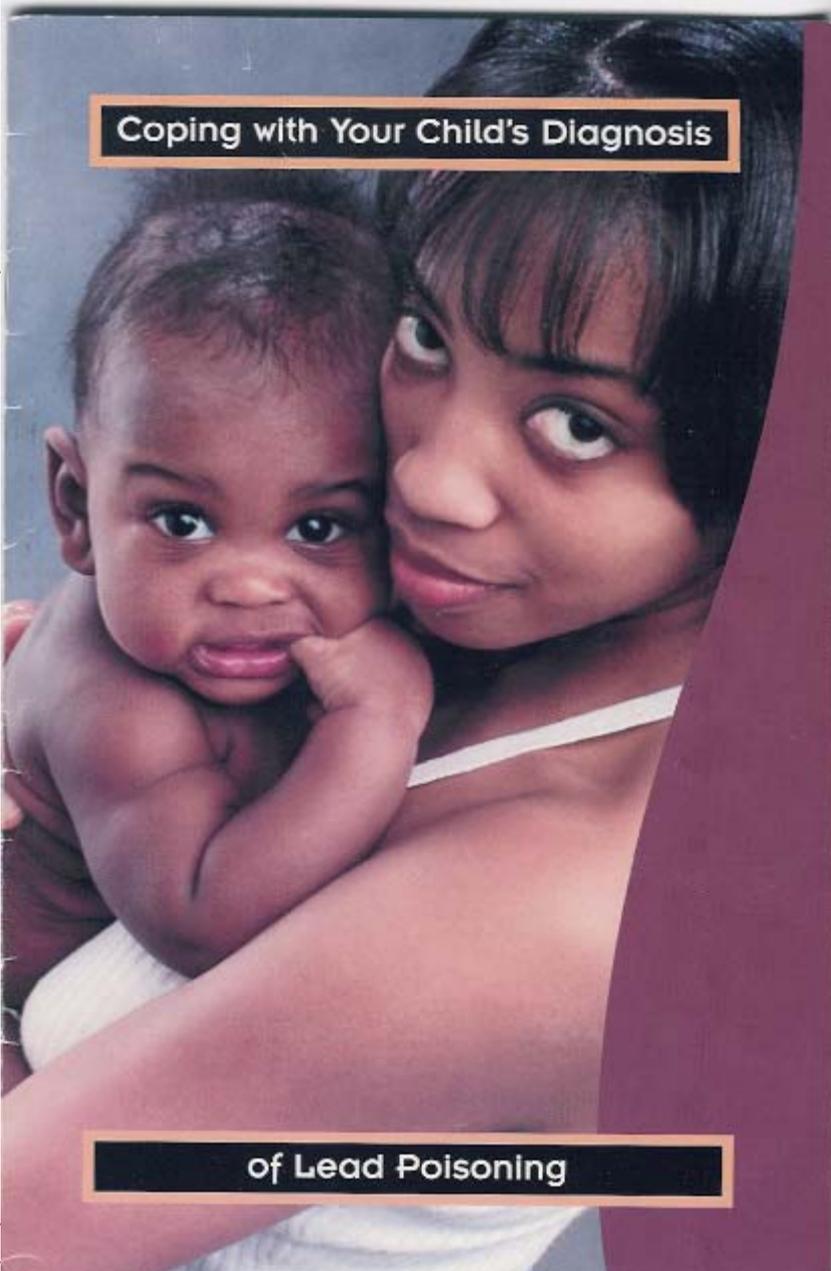
July 15, 1991

LEAD And Your Kids

Disturbing New Evidence
About the Threat
to Their Health

How to Protect Them



A photograph of a woman with dark hair and bangs, wearing a white top, holding a baby. The woman is looking towards the camera with a slight smile. The baby is looking towards the camera. The image is framed by a dark blue border. There are two text boxes: one at the top and one at the bottom. The top box is white with a black border and contains the text 'Coping with Your Child's Diagnosis'. The bottom box is black with a white border and contains the text 'of Lead Poisoning'. There are also two horizontal red lines on either side of the image, one above and one below.

Coping with Your Child's Diagnosis

of Lead Poisoning

Baltimore Demolition Methods

(1)

- Roles & Training in Lead Safe Work Practices
 - Designation of Full Time Dust Suppression Manager
 - Community Organization Meetings & Notification
 - Landscaping, greening of lots, street and sidewalk cleaning
 - Environmental Monitoring & Reporting
-
-

Baltimore Demolition Methods

(2)

– Fire Hoses

- At least 2 hoses during active demolition
 - one above, one below
 - 1 hose used on debris when equipment is moving over it
 - 4 hoses on many occasions to reduce dust
-
-

Baltimore Demolition

Note Location of Hoses



Thanks

- Students: Bogdan Catalin, Alison Welch
 - Faculty: Salvatore Cali, Victoria Persky, Serap Erdal
 - Metropolitan Tenants Organization: John Bartlett and Richard Gilliam
 - Researchers: Amy Mucha, Nicole Stites
 - Statistical and Quality Control Support: Sherry Dixon and Jill Breysse
 - Chicago Health and Environment Depts
 - Anne Evens, Patrick MacRoy, LaTonya Cannon
 - U.S Department of Housing and Urban Development
 - Many others from Baltimore
-
-

How About 2014?

Will the houses you are building today last one hundred years?

NEW YORK CITY has over a score of frame houses built before 1800.

"Well built," you say. True, but well painted, too, and almost uniformly with

Dutch Boy White Lead

and Dutch Boy linseed oil. Such paint, tinted any color, is so fine that it sinks into every joint and wood pore. It is

just elastic enough to prevent cracking, to keep the wood thoroughly covered and hence perfectly preserved.

Write for
PAINT FOLDER B

Tells how to mix materials for any variety of weather conditions; how to remove old paint and fast-drying colors; how to estimate quantity of paint and probable cost.



NATIONAL LEAD COMPANY

NEW YORK BOSTON DETROIT CHICAGO CINCINNATI



Sampling Results for Exterior Lead Dust in Single Family Housing Demolition

Presented by Salvatore Cali

Authors: S. Cali¹, D. Jacobs^{1, 3}, A. Welch, B. Catalin, V. Persky¹, A. Mucha¹, S. Erdal¹, S. Freels¹, A. Evens^{1, 2}, Patrick MacRoy⁴, Sherry Dixon³, P. Scheff¹

¹University of Illinois at Chicago, School of Public Health

²Center for Neighborhood Technology

³National Center for Healthy Housing

⁴Formerly Chicago Dept. of Public Health, Childhood Lead Poisoning Prevention Program

Project PI: David Jacobs

Purpose

Describe study results
and their significance

Acknowledgements

This project was supported by the U. S. Department of Housing and Urban Development (HUD Grant Number: ILLHT 0110-06), and some of the researchers were partially supported by National Institute of Occupational Safety and Health (NIOSH) Training Grant Number T42/OH008672. The contents of this presentation are solely the responsibility of the authors and do not necessarily represent the official views of U.S. HUD or NIOSH.

Study Description

- Target 100 events at free-standing, single-family (4 units or less) homes in Chicago undergoing demolition activities
 - Measure total and lead dust fall (deposition rate), and record housing characteristics and demo activities
 - Compare to total and lead dust fall at a variety of background locations
 - Opportunistic sampling
-
-

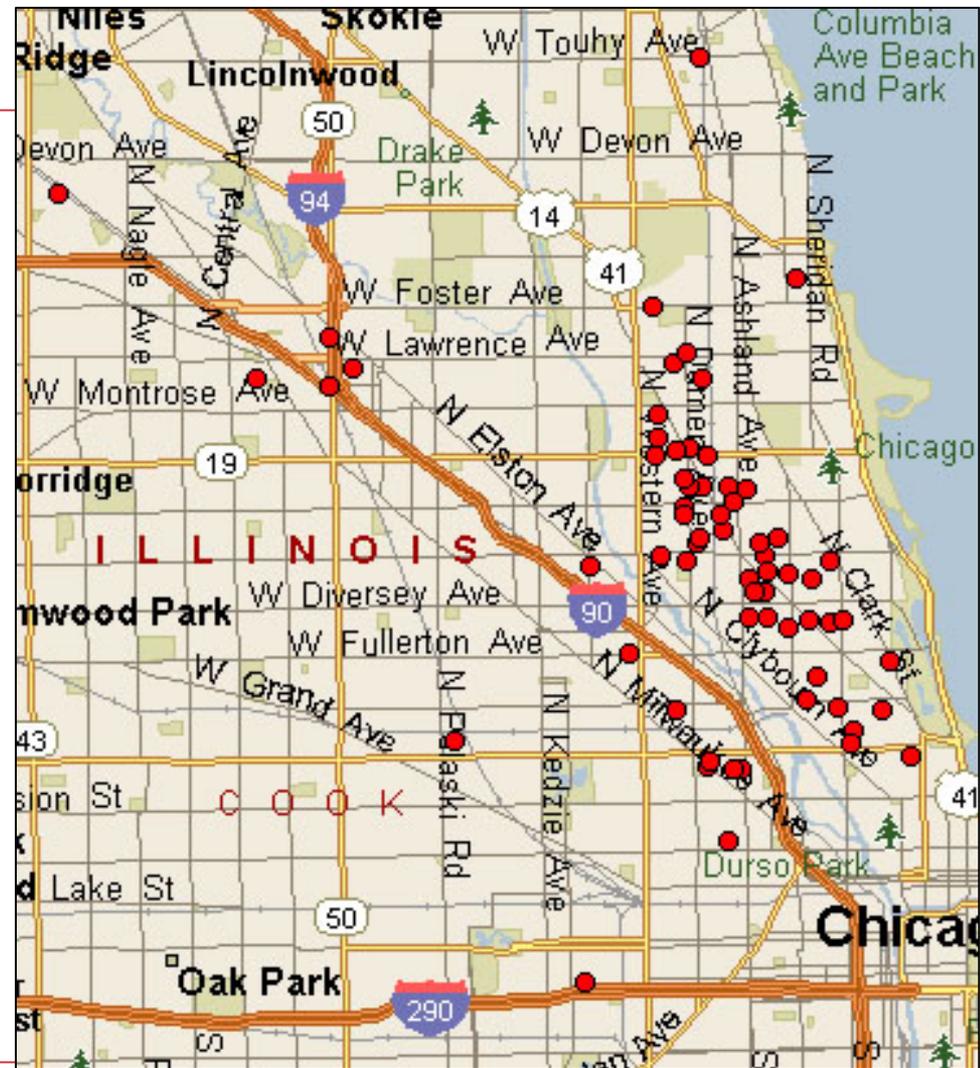


Study Description (continued)

- Compile weather information
- Characterize dust in subset of 20 demo/ 5 BG events using a variety of size-selective samplers and analysis for silica, asbestos, and metals



Site locations (as of Nov 2007)



Typical demo process/ activities:

Sample locations

Demo background
> ¼ mile away





Typical demo process/ activities: Reaching

Photos courtesy of
Bogdan Catalin

Enclosed stairwell removed





Typical demo
process/
activities:
Tight spaces

Typical demo process/ activities: Tight spaces



Typical demo process/ activities: Debris removal



Table 1: Summary of Lead Demolition Results ($\mu\text{g}/\text{ft}^2/\text{hr}$)

City	Average Lead Dustfall (No Demolition)	Average Lead Dustfall At the Perimeter of the Demolition Site	Maximum Lead Dustfall at the Perimeter of the Demolition Site
Baltimore 2006	<0.67	0.71	24
Chicago 2008	<0.26	6.12 Hose used* 5.4 No hose used 14.2	2974



More preliminary results

A HUD guideline for exterior surfaces (HUD Guidelines) is $800 \mu\text{g}/\text{ft}^2$

We measured $\mu\text{g}/\text{ft}^2/\text{hr}$, and looked at how much dust would accumulate over 8 hours; 14% of the sites exceeded $800 \mu\text{g}/\text{ft}^2$ after 8 hours

Table 2. Demolition Samples Above HUD Exterior Lead Dust Recommended Limit (800 $\mu\text{g}/\text{ft}^2$) After 8 Hours of Demolition Work

<u>Distance from Demolition (feet)</u>	Percent Above HUD Limit After 8 Hours
60 feet	10%
100 feet	7%
140 feet	5%
300 feet	1%

At 400 feet, lead dustfall from demolition was similar to background levels

Lead dust fall by distance issues

- Front door GPS
 - Property lines
 - Movement of demo activity point
 - All particles vs. lead particles
 - Particle size, weight and shape
-
-

Project accomplishments and progress

- 101 active demo events in 2007-08, good data
 - 38 background (reference) events
 - Current housing sale slowdown appears to have affected frequency of demolitions in 2008
 - Observer effect on dust suppression use?
-
-

Conclusions & General Recommendations

- Significant amount of lead dust is emitted by demolition of older homes
 - Research and improvement of dust suppression techniques needed
 - What are community needs relative to notification and controls?
-
-