Lead Workshop for Communities

Tuesday, September 26, 2017

U.S. Environmental Protection Agency

Region 5

Chicago, Illinois

Table of Contents

Lead Workshop for Communities
U.S. EPA – Region 5
Tuesday, September 26, 2017
12th Floor Conference Center

Time	Topic	Speaker(s)
9:30 am	Welcome	Alan Walts *U.S. EPA*
9:45 am	Lead 101	Susan Buchanan *Pediatric Environmental Health Specialty Unit* (PEHSU)
10:15 am	US EPA EJ Small Grantee Projects	
10:45 am	Communities Keynote	
	Addressing Lead in Chicago's Water	Troy Hernandez *Pilsen Environmental Rights and Reform Organization*
	Transitions from Reactive to Proactive Strategies	John Bartlett *Metropolitan Tenants Organization*
11:30 am	Lunch	
11:45 am	**OPTIONAL** Working Lunch on EJSCREEN and CFERST	Mark Messersmith and Kathy Triantafillou *U.S. EPA*
12:30 pm	Federal Partners	
	Lessons from Flint	Lauren Eiten and Ruth Hughes *U.S. Department of Health and Human Services*
	Green and Healthy Homes	Paul Deigelman *U.S. Department of Housing and Urban Development*
	Nutrition and Lead	Alan Shannon *U.S. Department of Agriculture*
1:15 pm	Healthcare and Advocates	
	Collaboration and Lessons Learned	Anita Weinberg *Loyola University*
	Engaging Community Partners	Theresa Heaton

	Lead in Chicago	*Kane County Department of Public Health* Cortland Lohff *Chicago Department of Public Health*
2:15 pm	*Networking Break*	
2:45 pm	U.S. EPA Programs	Tony Martig *Lead Program* Joe Dufficy *Superfund/Brownfields Program* Tom Poy *Water Program* Sarah Arra *Air Program* Maryann Suero *Children's Health Program*
4:00 pm	National Picture Conversation	David Jacobs *National Center for Healthy Housing* Michael McKnight *Green and Healthy Homes*
5:00 pm	Closing	Alan Walts *U.S. EPA*

Optional post-workshop networking – Ceres Café, 141 W Jackson Blvd – table reserved under Elizabeth Poole.

Panels and working lunch will be held in the Lake Michigan Room. Networking space will be in the Illinois Room.

What's new with lead poisoning: Tap water, pica, and pregnancy

Susan Buchanan, MD, MPH

September 2017

Great Lakes Center for Children's Environmental Health
Region 5 Pediatric Environmental Health Specialty Unit (PEHSU)

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Acknowledgement/Disclosure

- *The findings and conclusions in this presentation have not been formally disseminated by the Agency for Toxic Substances and Disease Registry and should not be construed to represent an agency determination or policy.*

- *Acknowledgement: The U.S. Environmental Protection Agency (EPA) supports the PEHSU by providing partial funding to ATSDR under Inter-Agency Agreement number **DW-75-95877701**. Neither EPA nor ATSDR endorse the purchase of any commercial products or services mentioned in PEHSU publications.*

- *Dr. Helen Binns and Dr. Linda Rae Murray for some slides*

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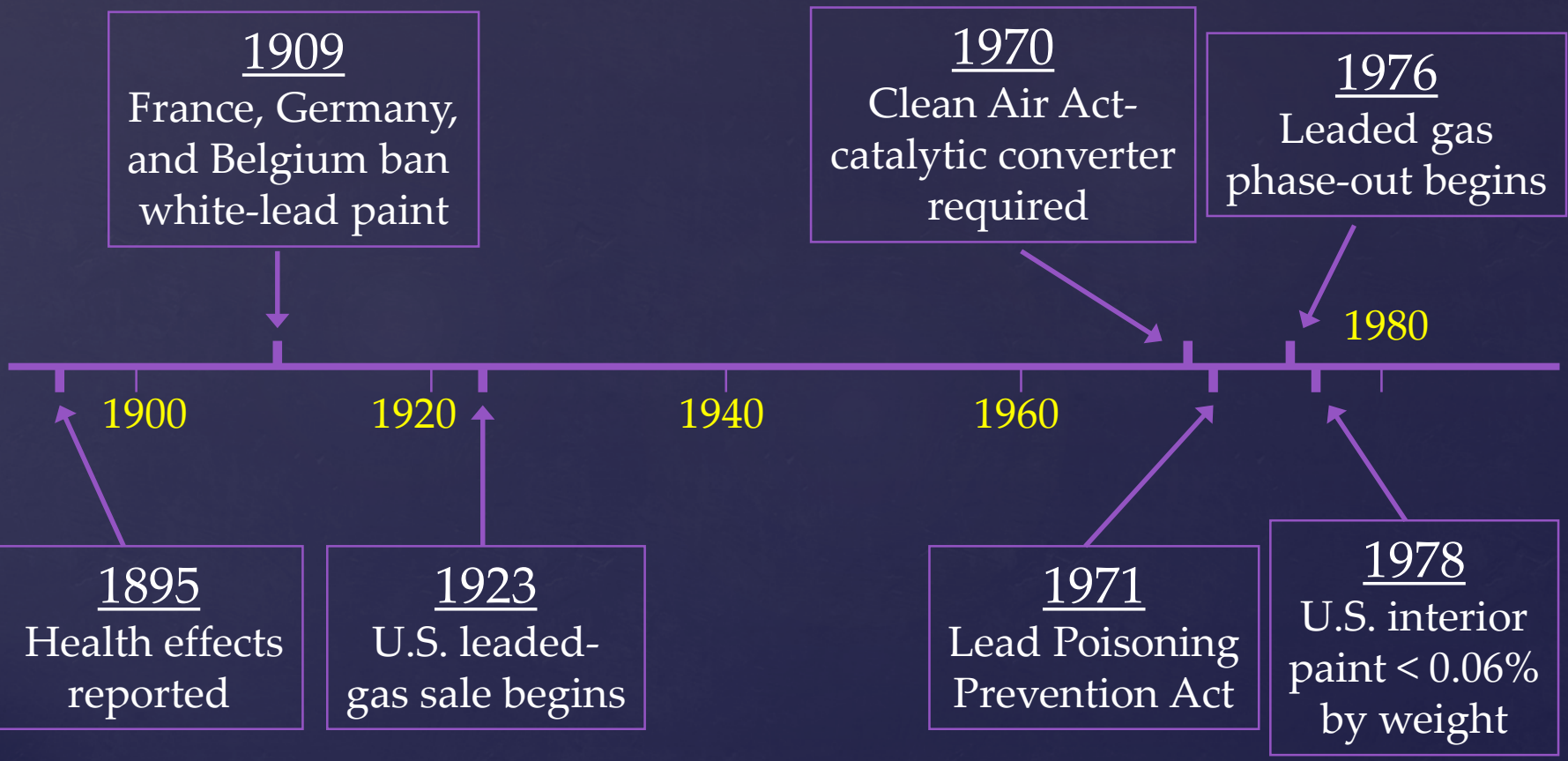
PEHSU
Pediatric Environmental Health Specialty Units

Lead Timeline



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Markowitz, *AJPH* 2000;90:35-46

Lead Poisoning Usually Has No Obvious Symptoms!

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Overt Signs and Symptoms of Lead Poisoning

Lower BLL
(<25 µg/dL)

- **Usually none**
- Longer term:
  - Developmental delay
  - Learning problems
  - Lower attention

Moderate BLL
(25-69 µg/dL)

- Constipation
- Abdominal pain
- Poor appetite
- Anemia (~40 µg/dL)

High BLL
(≥70 µg/dL)

- Poor appetite
- Vomiting
- Irritability
- Lethargy
- Seizures

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At mean blood lead levels < 5ug/dl

- Sufficient evidence for:
  - *Attention-related problems*
  - *Greater incidence of problem behaviors*
  - *Decreased cognitive performance*

National Toxicology Program

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National Toxicology Program Monograph on Health Effects of Low-Level Lead 2012

How are children exposed to lead?

- **Paint** flakes/chips and contaminated dust
  - Highest risk spots:
    - Windows
    - Porches

- **Soil**
  - Near buildings, under porches
  - Track-in

- **Tap water** – lead service lines
- **Ethnic/imported foods, make-up, remedies**

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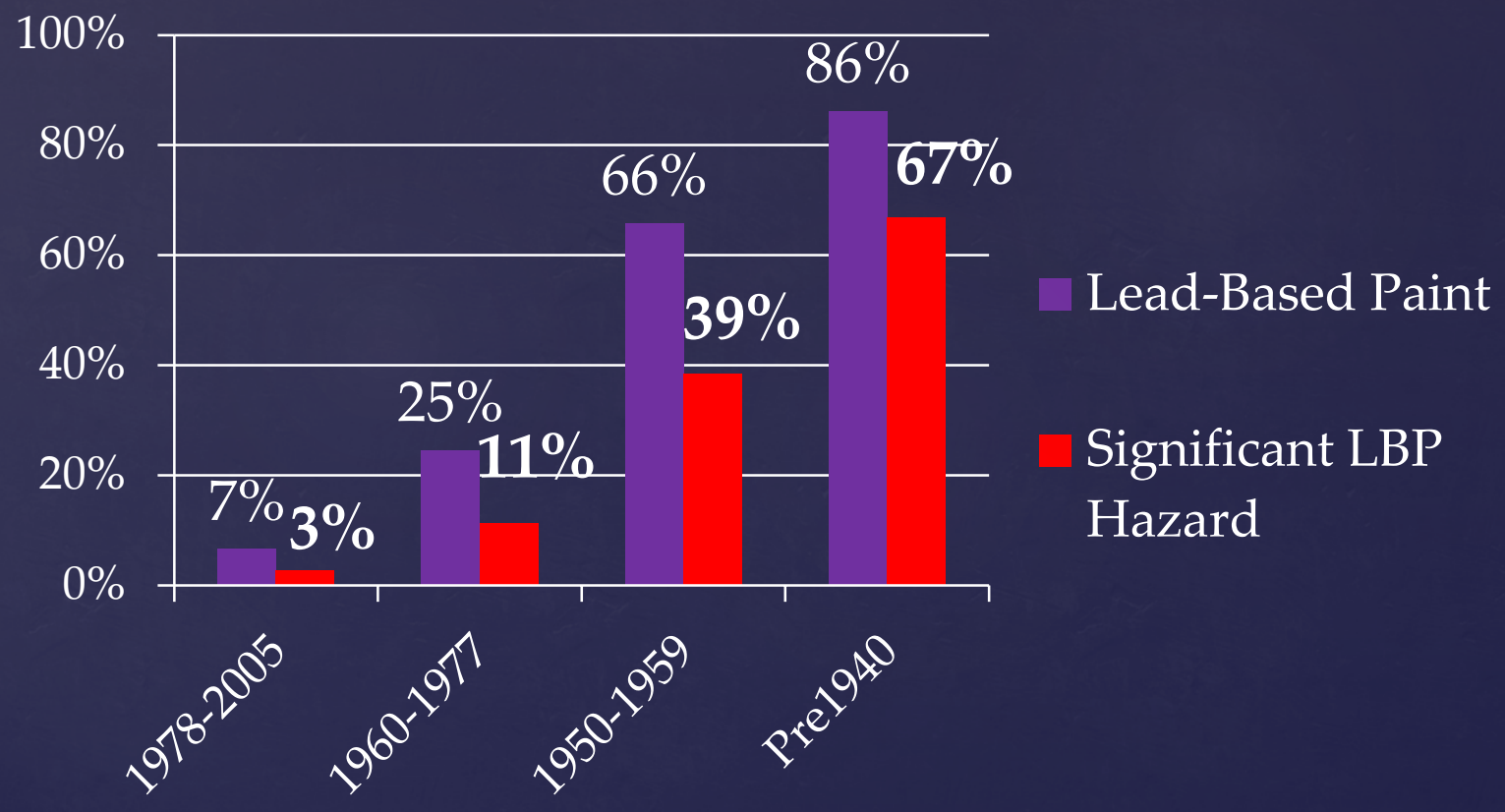
Tumeric Recalled Due To Excessive Levels of Lead

PRAN brand Tumeric spice powder is being RECALLED because it contains high levels of lead.

The recalled spice powder was distributed in New York and New Jersey through retail stores and direct delivery.

The recalled product is packed in 250 and 400 gram clear plastic jars with yellow lids and "Best Before" dates Oct. 26, 2014 and Jan. 15, 2015. Consumers who have purchased PRAN Tumeric are urged not to consume the product

U.S. Housing-based Lead Paint Risk



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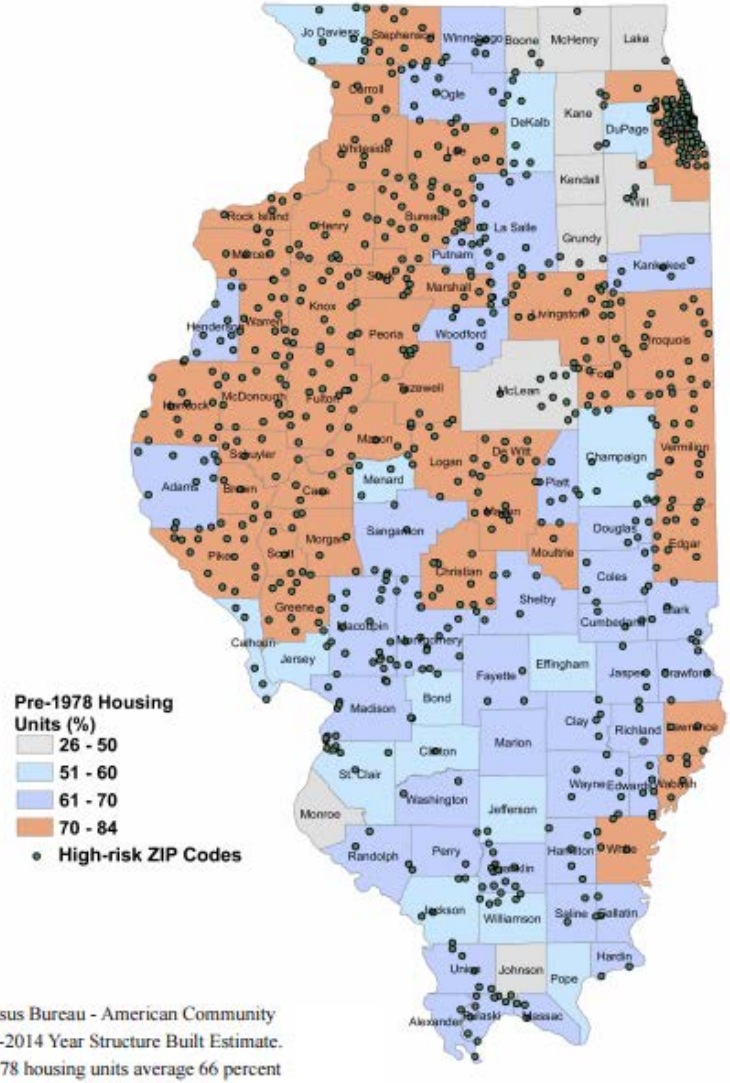
American Healthy Homes Survey (AHHS), 2011

IDPH Lead Program
2015 Surveillance Report

Figure 3: Percent of Pre-1980 Housing Units by Illinois County and High-Risk ZIP Codes for Childhood Lead Poisoning



Source: Census Bureau - American Community Survey 2010-2014 Year Structure Built Estimate.
Note: Pre-1978 housing units average 66 percent by Illinois county. Created 12/15/2016.

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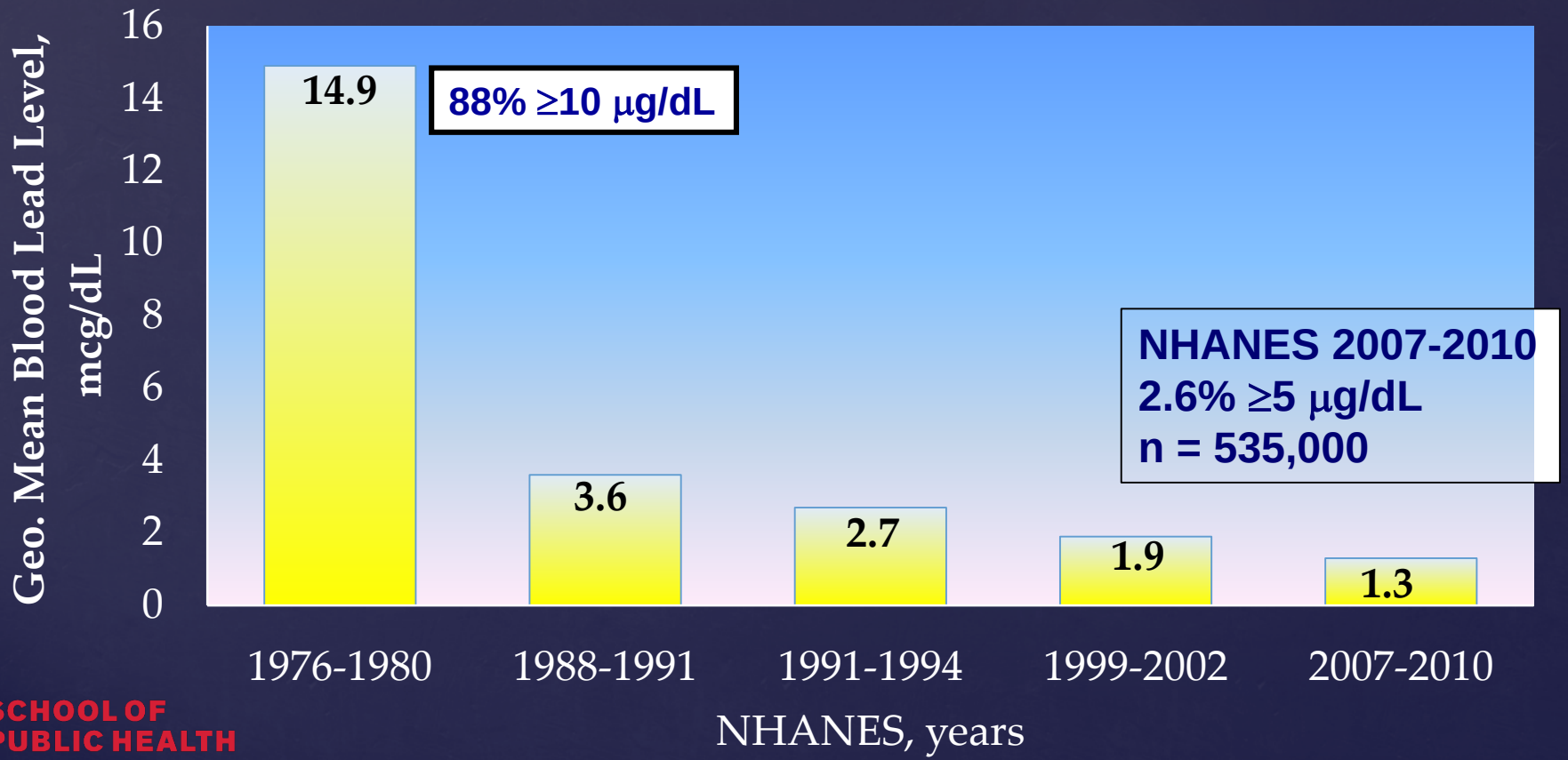
Geometric Mean Blood Lead Levels in Children Ages 1 to 5 years (National Health & Nutrition Surveys)



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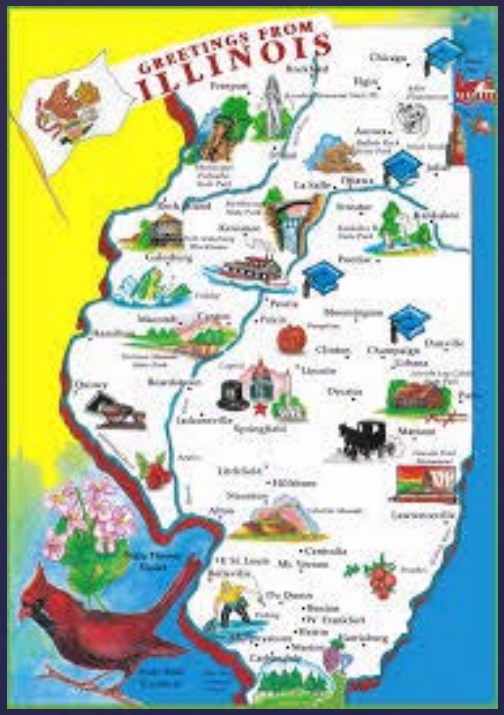
Lead poisoning in Illinois (≤ 6yo)

- Screening rate: 23%
- Mean: 2.3µg/dL
- Percent elevated: 4%
  - 81% BLL = 5 - 9µg/dL
  - 19% BLL ≥10µg/dL

  - Black/AA : 4.3%
  - White: 2.5%



http://ontheworldmap.com/usa/state/illinois/

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Lead in Tap Water: Flint, Michigan

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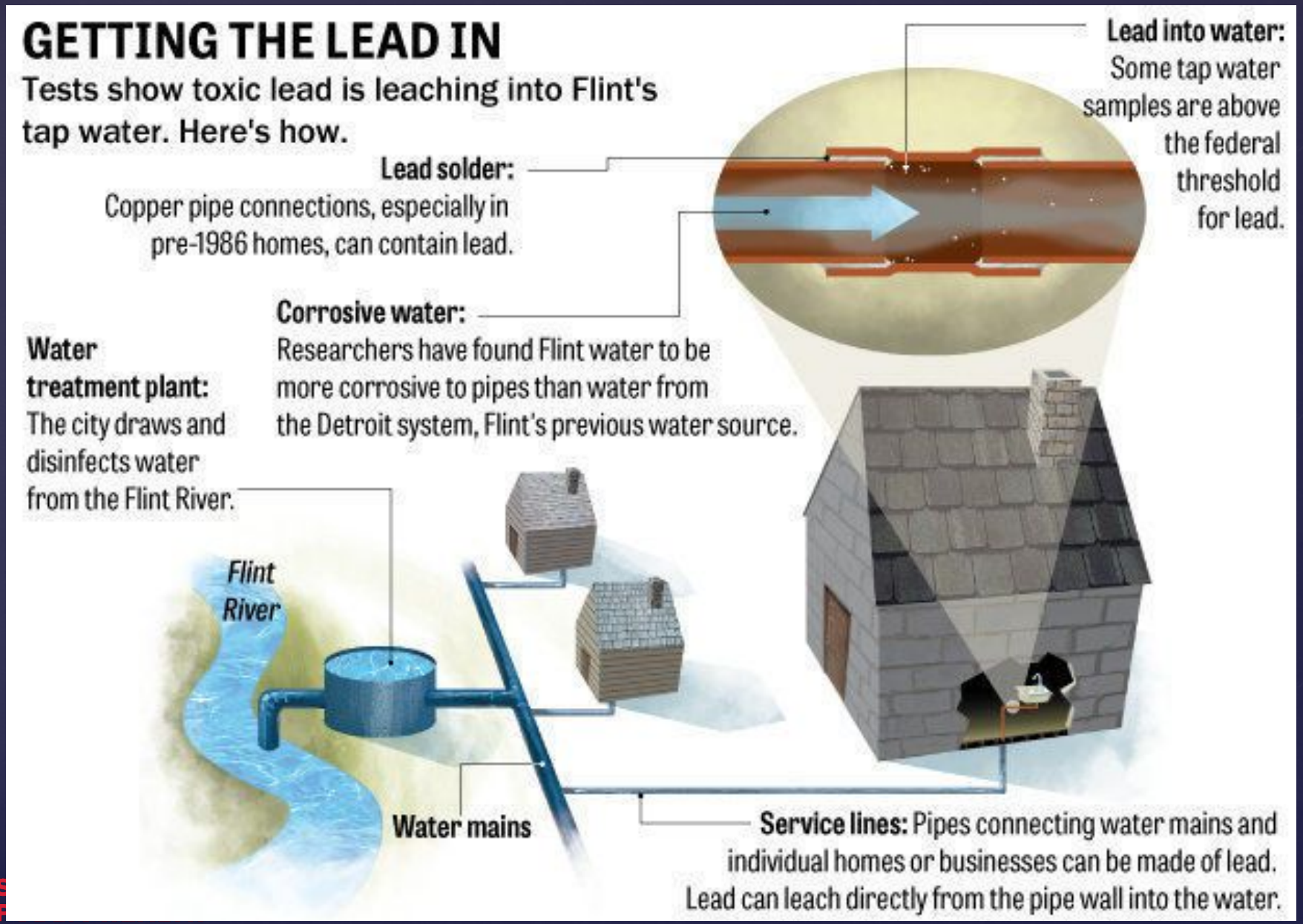
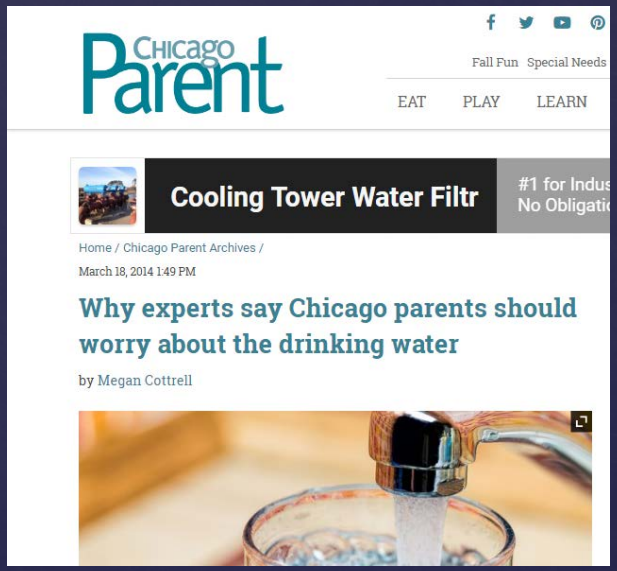


https://ethicsalarms.com/2016/01/19/ethics-questions-and-answers-regarding-the-flint-michigan-water-crisis/



Lead in water: Chicago

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How much does lead in drinking water contribute to blood lead?

- Up to 20% of blood lead may be due to lead in tap water.
- For bottle-fed infants may be > 50%.

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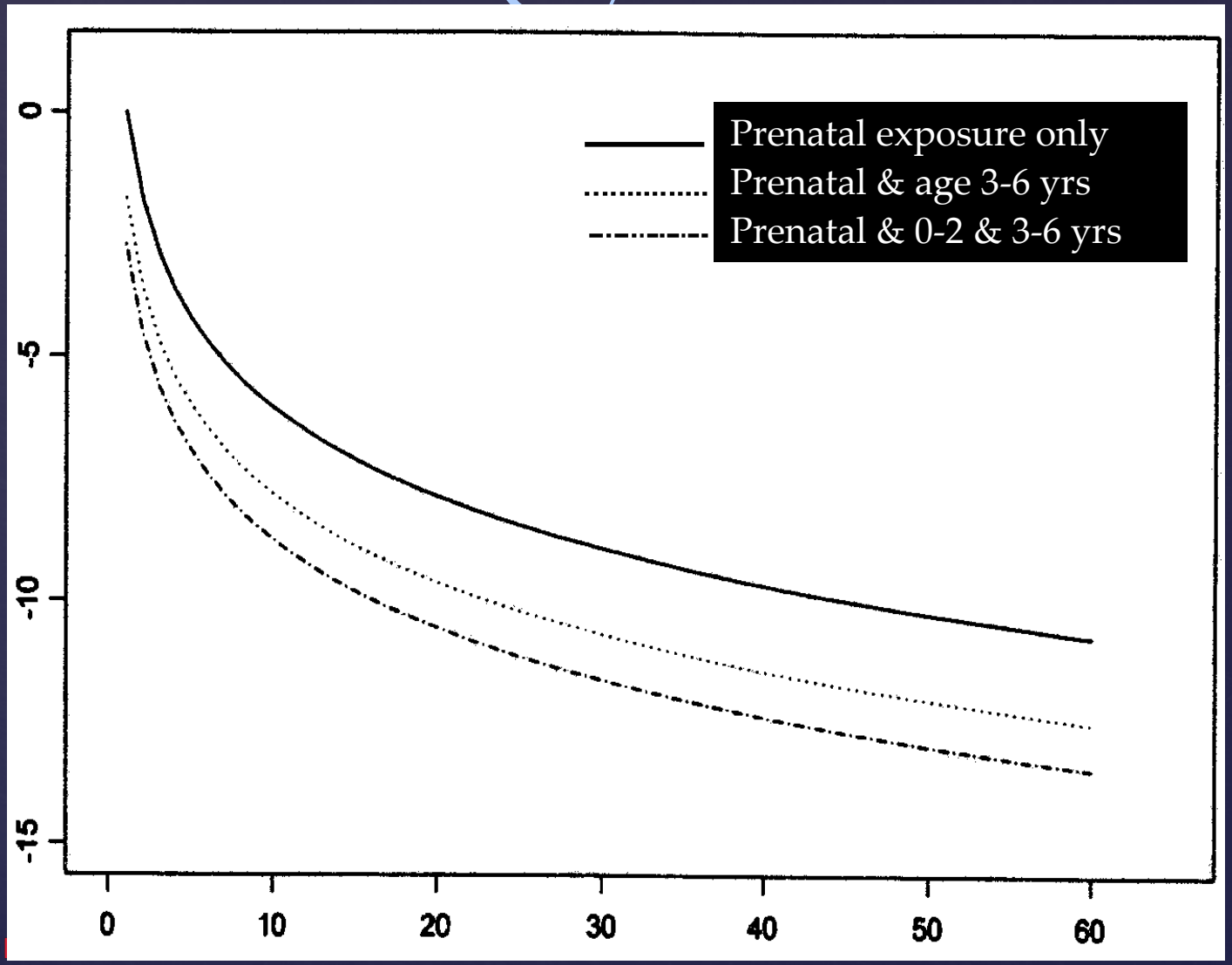
[US EPA 1993]

Lead Exposure in Pregnancy

http://www.poison.org/articles/2013 jul/lead and pregnancy

Decrements in IQ by Prenatal Blood Lead



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Wasserman et al. *Neurotoxicol Teratol*. 2000; 22:811-818

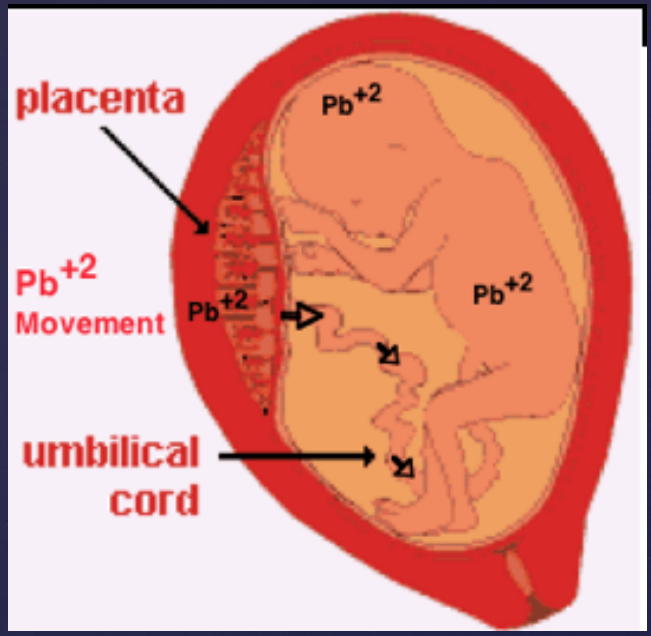
Lead absorption in pregnancy

Fetus/Infant Blood Lead:

- 1:1 with maternal blood lead

Maternal Blood:

- Fall in BLL from 12-20 weeks
- Rising levels 20-40 weeks



The Cellular Effect of Lead Poisoning and Its Clinical Picture
GUJHS. 2008 Dec; Vol. 5, No. 2.

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Pregnancy: How are women exposed?

- Occupational exposure
- Home repair work
- Hobbies
- Born outside US
  - 90% with BLL ≥20 µg/dL foreign born
  - 8 times increased risk, esp. Bangladesh, Mexico & Pakistan

Photo credit: Mr. toaster via Photopin cc

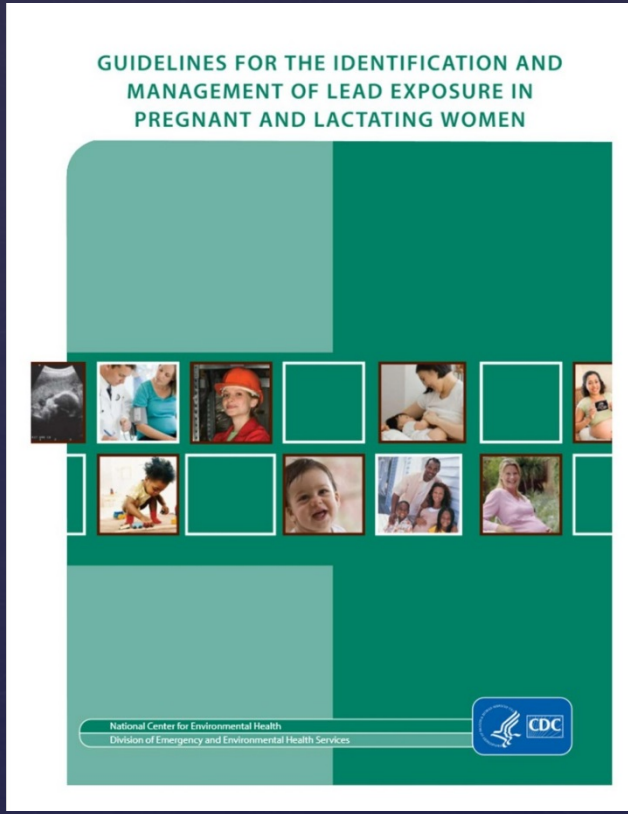
Klitzman S, et al. J Urban Health 2002;79:225-237

Lead Exposures in Pregnancy

- Pottery use
- Pica (eating non-food substances) – pottery, paint chips
- Geophagia – eating clay or dirt
- Water

Lead in Pregnancy:
Guidelines

- **If the pregnant women is at risk for lead exposures, check BLL at first prenatal visit**
- Includes additional evaluations & counseling for women with BLL ≥5 µg/dL
- Recommendations for breast feeding based on mother's blood lead level



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www.cdc.gov/nceh/lead/publications/LeadandPregnancy2010.pdf

Screening Questions (IDPH)

Illinois
1. Born outside of the United States
2. Use imported or homemade health remedies, spices, foods, or ceramics
3. Pica (eating non-food items)
4. Live in a house built before 1978 with ongoing renovations
5. You or household member with occupation/ hobby with lead exposures
6. Live with someone who has an elevated blood lead level or you had past elevated blood lead level

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Available in English and Spanish - Check IDPH web site

Women with BLL ≥5 µg/dL

BLL, µg/dL	Follow-up
5-14	Within 1 month
15-24	Within 1 month and every 2-3 months
25-44	BLL 1-4 weeks and monthly
≥45	Within 24 hours; Subsequent BLLs depend on treatments

- Determine exposures, provide education
  - Job protections?
- Ensure Calcium, Vitamin D, iron sufficiency
- Get CORD BLOOD LEAD on infant

Promote Nutritional Health

- Treat iron deficiency
  - Vitamin C ↑ iron absorption
- Ensure Recommended Daily Allowance
  - Calcium
  - Provide daily multivitamin with iron

- Enhanced absorption of lead after prolonged fast (so eat breakfast)

*Solon et al. J Pediatr 2008;152:237-43)

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Language Enrichment for Lead Exposed Children

- Begin in early months of life
- Provide quantity
  - TV is NOT a substitute
- Attend to quality of language
  - Simple language, use repetition, enunciate
  - Conversation (allow the child to talk to you)
  - Listen
  - Be positive (do not correct a child's speech)
  - Reading (vocabulary, use of book to start conversation); effect of reading evident by age 2

PEHSU
Pediatric Environmental Health Specialty Units

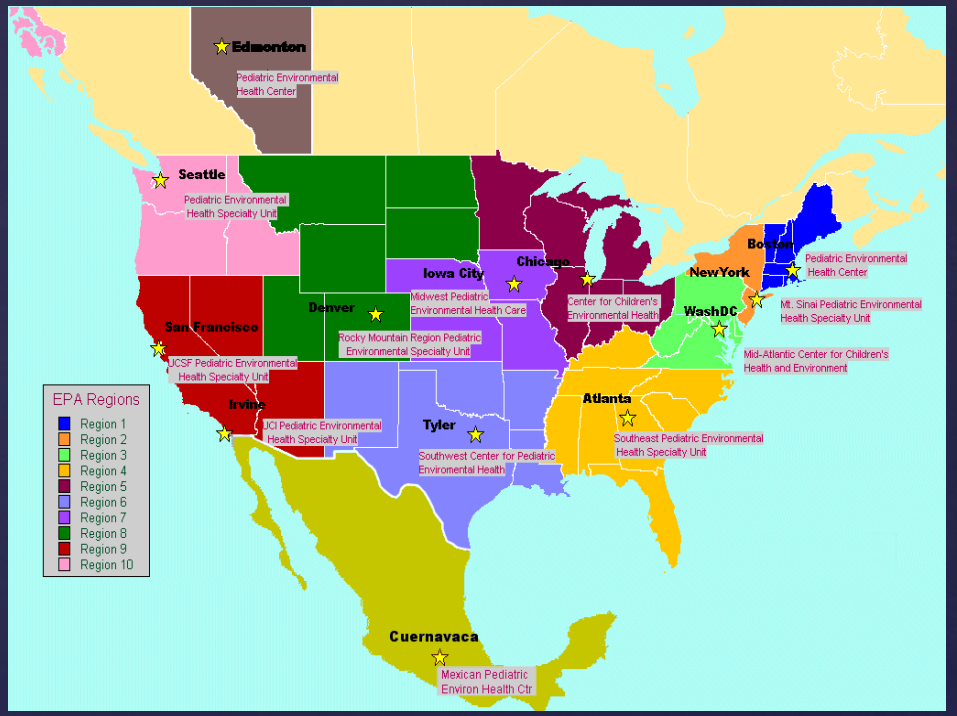
PEHSUs are staffed by:

- Occupational/Environmental Med physician

  or

- Peds or Family Med physician

- Medical toxicologist
- Pediatric health nurse
- Industrial hygienist



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PEHSU
Pediatric Environmental Health Specialty Units

- Provide pediatric environmental health education to physicians, nurses, and other health professionals
- Offer medical consultation to healthcare providers, Clinic visits if necessary
- Assist public health and environmental agencies, community groups, municipalities

PEHSU Services

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Great Lakes Center for Children's Environmental Health

Indra Frank, MD MPH
Indiana

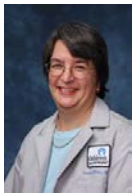
Deepak Kamat, MD PhD
Michigan

Matt Keifer, MD MPH
Wisconsin

L to R: Mark Mycyk MD, Ann Naughton RN, Alanah Raykovich MPH, Susan Buchanan MD MPH, & Gary Loy MD MPH

Not Pictured: Beth Baker, MD MPH
Minnesota

Nick Newman, DO
Director, PEHSU Satellite in Cincinnati, OH



Helen Binns, MD MPH
Director, Lead Evaluation Clinic at Lurie Children's Hospital Chicago

Region 5 Pediatric Environmental Health Specialty Unit (PEHSU)

(312)864-5526 or (866) 967-7337

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Factsheets

HEALTHCARE PROVIDER GUIDE: Phthalates and Bisphenol A

PEHSU Pediatric Environmental Health Specialty Units

Phthalates and bisphenol A (BPA) are man-made chemicals that are known endocrine disruptors. They can affect hormones such as estrogen and testosterone, and potentially disrupt normal growth and development. Historically, discussions of sources of phthalate and BPA exposure focused on plastics; but current research highlights several sources of exposure including food, personal care products, and dust.

Phthalates

Phthalates are man-made chemicals that give flexibility to soft plastics and polyvinyl chloride (PVC) products, and are used in a variety of personal care products (i.e. shampoos, lotions, makeup, perfume). They can be found in plastic mec
total parenteral nut
time-released medi
the US food supply
used in conveyer be
gloves, packaging, s

- The majorit
- The major s

animal fats,
of plastics (f

foods and high fat dairy and meats are particularly high in phthalates.

Bisphenol A (BPA)

PEHSU Pediatric Environmental Health Specialty Units

The American Academy of Clinical Toxicology

Uniting scientists and clinicians in the advancement of research, education, prevention and treatment of diseases caused by chemicals, drugs and other toxins.

Chelation Therapy - Guidance for the General Public

Note: This information is only provided as a service to the public and is not meant to replace medical advice given to individuals seeking treatment. Please talk to your health care provider.

What is "chelation (key-lay-shun) therapy"?

In standard medical practice, certain medications (also known as 'chelants' [key-lints]) are used in specific situations to help remove high levels of certain metals from the body. The chelators bind to these metals in the blood and some body tissues causing them to be more quickly eliminated in the urine or stool. Whether the chelation medication is swallowed, or injected into the muscle or vein, depends on the type of chelation medication used and the medical situation of the patient being treated. Some practitioners of complementary medicine use medications or natural products, labeled as chelators, to treat a variety of chronic medical conditions (see below)

When has chelation therapy been scientifically shown to be useful?

PEHSU Pediatric Environmental Health Specialty Units

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

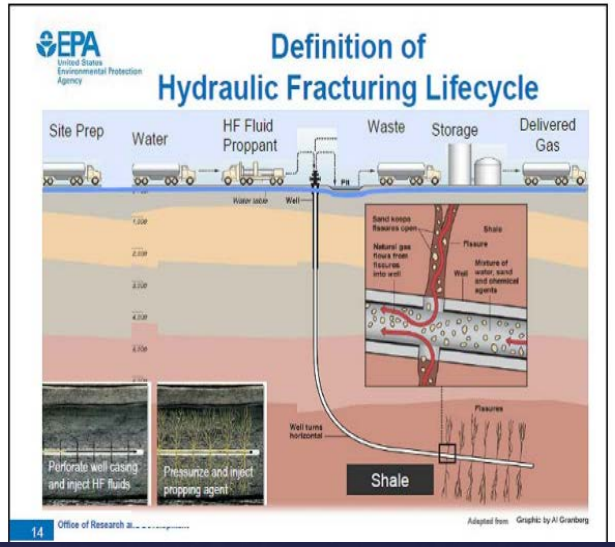
PEHSU Information on Natural Gas Extraction and Hydraulic Fracturing for Health Professionals

The Pediatric Environmental Health Specialty Units (PEHSU) Network encourage families, pediatricians, and communities to work together to ensure that children are protected from exposure to environmental hazards.

Background

Natural gas extraction from shale is a complex process which includes: 1) building access roads, centralized water and flowback holding ponds and of the site itself ; 2) construction of pipe lines and compressor stations; 3) drilling ; 4) hydraulic fracturing; 5) capturing the natural gas; 6) and disposal (or recycling) of, flowback water and drill cuttings.

Hydraulic fracturing, also known as hydrofracking or fracking, uses a combination of water, sand, and chemicals injected into the ground under high pressure to release natural gas. The HF process is also used in some parts of the country for extracting oil. This process has become much more common in the US over the last decade. It was first used for natural gas in Colorado, Wyoming, and Texas. The practice has recently spread into other states, including West Virginia, Pennsylvania, and New York. The figure below is a diagram of the process:



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Messaging

Fact Sheet on Soil Contamination in East Chicago
August 2016

Introduction
The United States Environmental Protection Agency (EPA) has documented that the soil in the West Calumet Housing Complex (WCHC) in East Chicago, Indiana contains elevated levels of lead and arsenic.
This fact sheet will address some of your questions and will also provide you with recommendations for reducing exposure to lead and arsenic from the soil in the WCHC.

Where did the lead and arsenic come from?
The elevated levels of lead and arsenic in the soil are left over from contamination that occurred years ago by the operations of several lead smelting facilities that were located in this area until the 1960s.

How does the lead and arsenic in soil get into our bodies?
Contaminated soil can enter the body if it is swallowed or breathed in. Soil generates small dust particles that can settle on clothing, on toys, and in the home. It can enter the home on the soles of shoes and other items such as bike tires. Children may swallow the dust when they put their hands and toys in their mouths. *Young children (under the age of 6) are at the greatest risk of exposure to the lead and arsenic dust because they play in soil and put soil-covered toys and hands in their mouths.* In fact, children get about twice as much soil in their bodies from their activities as do adults.

Has the lead and arsenic in the soil from the East Chicago site gotten into our bodies?
Most of us have some lead and arsenic in our bodies from exposures in everyday life. It is not possible to determine whether the lead and arsenic in your body is from your exposure to the contaminated soil or another source. The East Chicago Health Department and others have been conducting blood testing for lead and have found that more children have elevated blood lead levels than would normally be expected. This may be from the soil.

Testing for arsenic in the body is not reliable and is reserved for cases of high-dose poisoning rather than exposure from the environment. It is usually conducted by poison specialists.

How can the lead and arsenic from the soil affect our health?
Over time, lead can damage children's nervous systems which may result in small changes to IQ and behavior.

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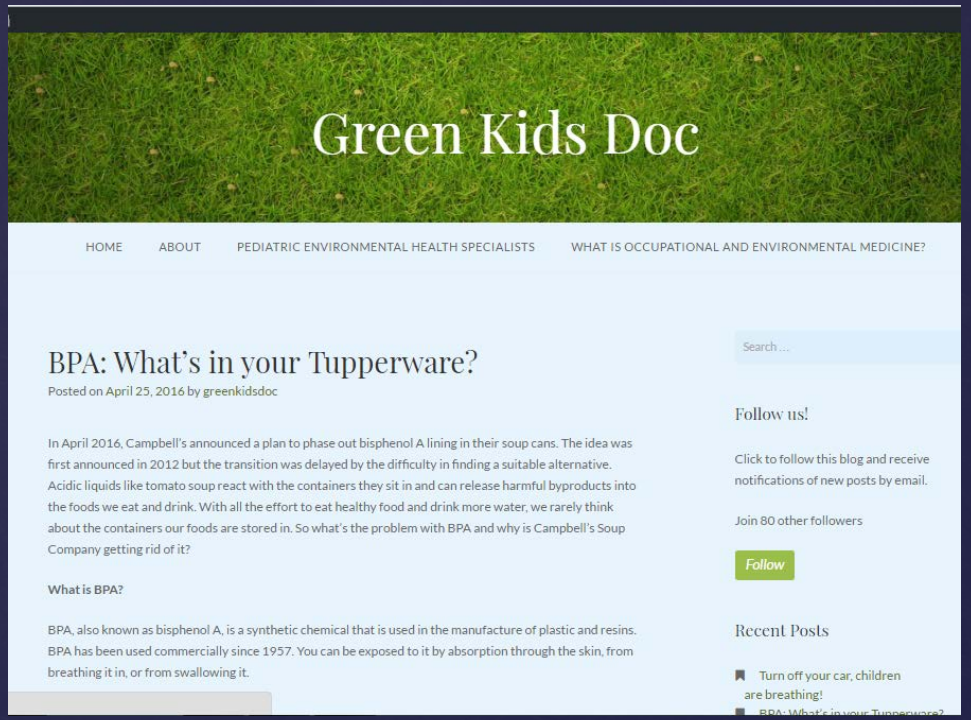
GreenKidsDoc blog

- Lead
- Mercury (organic, elemental)
- Fluoride
- Radiation
- Sun screens
- Radon
- Artificial turf
- Pesticides



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PRENATAL ENVIRONMENTAL EXPOSURE HISTORY

Assessment	Yes	No	Steps to Reduce Risk
Have you or anyone living in your house ever been treated for lead poisoning?			Have your home tested for lead if it was built before 1978
Do you live in a house built before 1978?			Avoid remodeling or hire a certified contractor
Are there any plans to remodel your home?			
Have you ever lived outside the United States?			Call 1-800-424-LEAD for more information
Does your family use imported pottery or ceramics for cooking, eating, or drinking?			Do not use lead -containing home remedies
Have you used any home remedies such as azarcon, greta, pay-loo-ah?			Do not eat clay, soil, dirt, pottery, or paint chips because they may contain high levels of lead
Have you ever eaten any of the following:			
Clay			Eat foods enriched with iron (lean red meats, chicken), calcium (dairy products and green leafy vegetables), and vitamin C (oranges, grapefruits, tomatoes, and green peppers)
Soil or dirt			
Pottery			
Paint chips			
Is there a mercury thermometer in your home?			Use a digital or mercury-free thermometer Dispose of mercury at hazardous waste sites
Do you eat any of the following types of fish:			Do not eat shark, swordfish, king mackerel or tilefish because they contain high levels of mercury Albacore tuna contains more mercury than canned light tuna; Do not eat more than one meal (6 oz) per week of albacore tuna. Contact local health dept. about local fish advisories
Shark			
King Mackerel			
Swordfish			
Tilefish			
Albacore tuna ("white" tuna)			
If so, do you eat more than one meal per week of the selected fish?			
Do you use a wood burning stove or fireplace?			Ensure adequate ventilation of wood burning stoves and fireplaces. Avoid exposure to paint fumes, wood strippers, and other products containing solvents. Crack a window when using space heaters. Avoid outdoor exercise on high air pollution days.
Do you plan on having rehab or painting done in your home during your pregnancy?			
Do you use kerosene or gas space heaters?			
Do you live near an industrial site or busy roadway?			
Does your home have a:			Smoke and carbon monoxide detectors should be installed on all floors and near bedrooms
Smoke detector?			
Carbon monoxide detector?			
Does anyone who lives in your home smoke?			Avoid public places where smoking is allowed Make your home smoke-free
Do any people who will be taking care of the baby smoke?			
Do you use pesticides (insecticides, herbicides, rodenticides) such as Raid, 'Weed & Feed' or OFF:			Practice Integrated Pest Management Avoid sprays, foggers, and bug bombs. For more information go to the National Pesticide Information website, http://npic.orst.edu/
Inside your home?			
Outside your home?			
On your pets?			
What do you do for work?			Always wear proper personal protective equipment (PPE)
Are you exposed to any of the following at work:			
Metals			
Solvents			
Chemicals			
Radiation			
Fumes			

CREHM • 835 S. Wolcott, Suite E-144, MC 684 • Chicago, Illinois 60612 • Tel. (312) 864-5526

TRUMBULL NEIGHBORHOOD PARTNERSHIP

Safe Soil Handling Practices for Residential and Community Land Use in a Legacy City

TRUMBULL NEIGHBORHOOD PARTNERSHIP

TRUMBULL
NEIGHBORHOOD
PARTNERSHIP

- **Trumbull Neighborhood Partnership** is a 501(c)(3) non-profit Community Development Corporation serving the neighborhoods of Warren, Ohio.
- The mission of **Trumbull Neighborhood Partnership** is to empower residents and promote sustainable community development through projects and programs that increase the quality of life in Warren's neighborhoods.

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Warren, Ohio

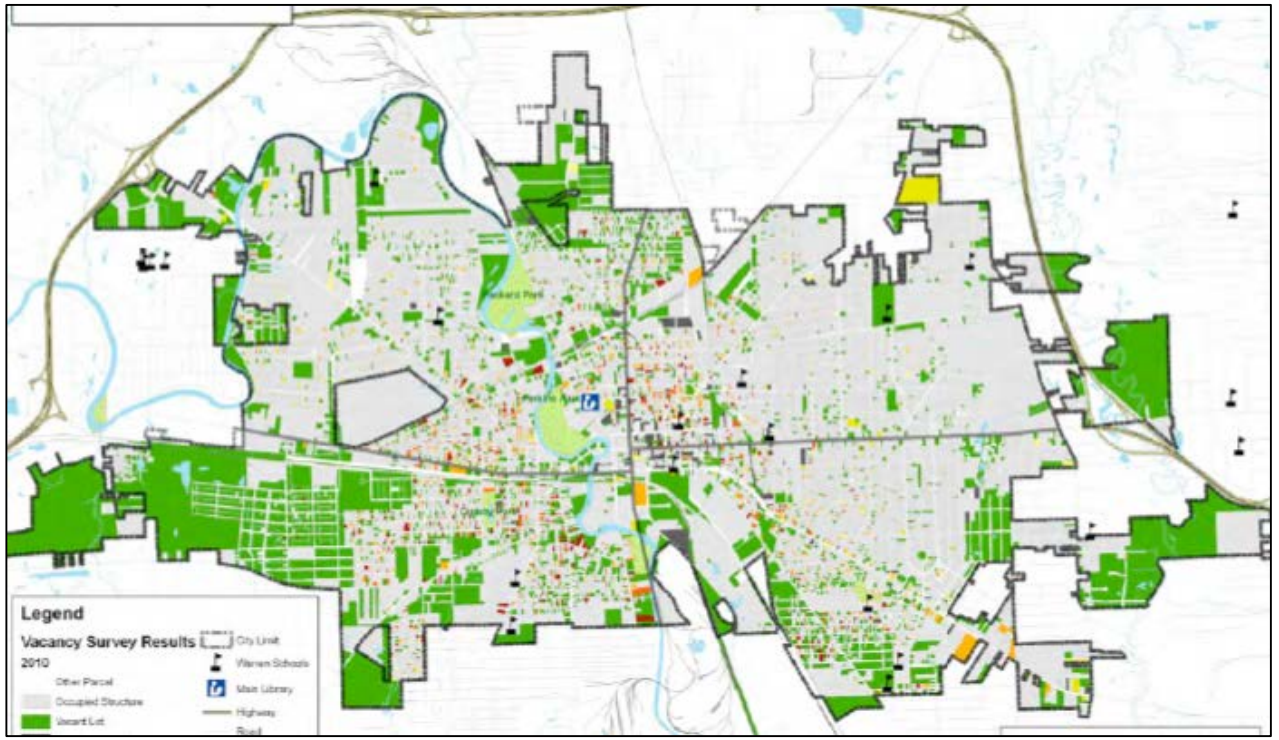
40,245 - Population

1,500 - Vacant houses

90% - Housing built prior to 1978

1,000 - Demolitions completed in past eight years

400 - 500 – Projected demolitions in the next two years



TRUMBULL NEIGHBORHOOD PARTNERSHIP

TRUMBULL COUNTY
LAND BANK

TRUMBULL
NEIGHBORHOOD
PARTNERSHIP

Demolition

TRUMBULL
NEIGHBORHOOD
PARTNERSHIP

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Vacant Land Reuse

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Connect With Us!

tnpwarren.org

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Co-Creating Healthy Homes & Renters' Rights Trainings with Refugee Newcomers

refugee development center

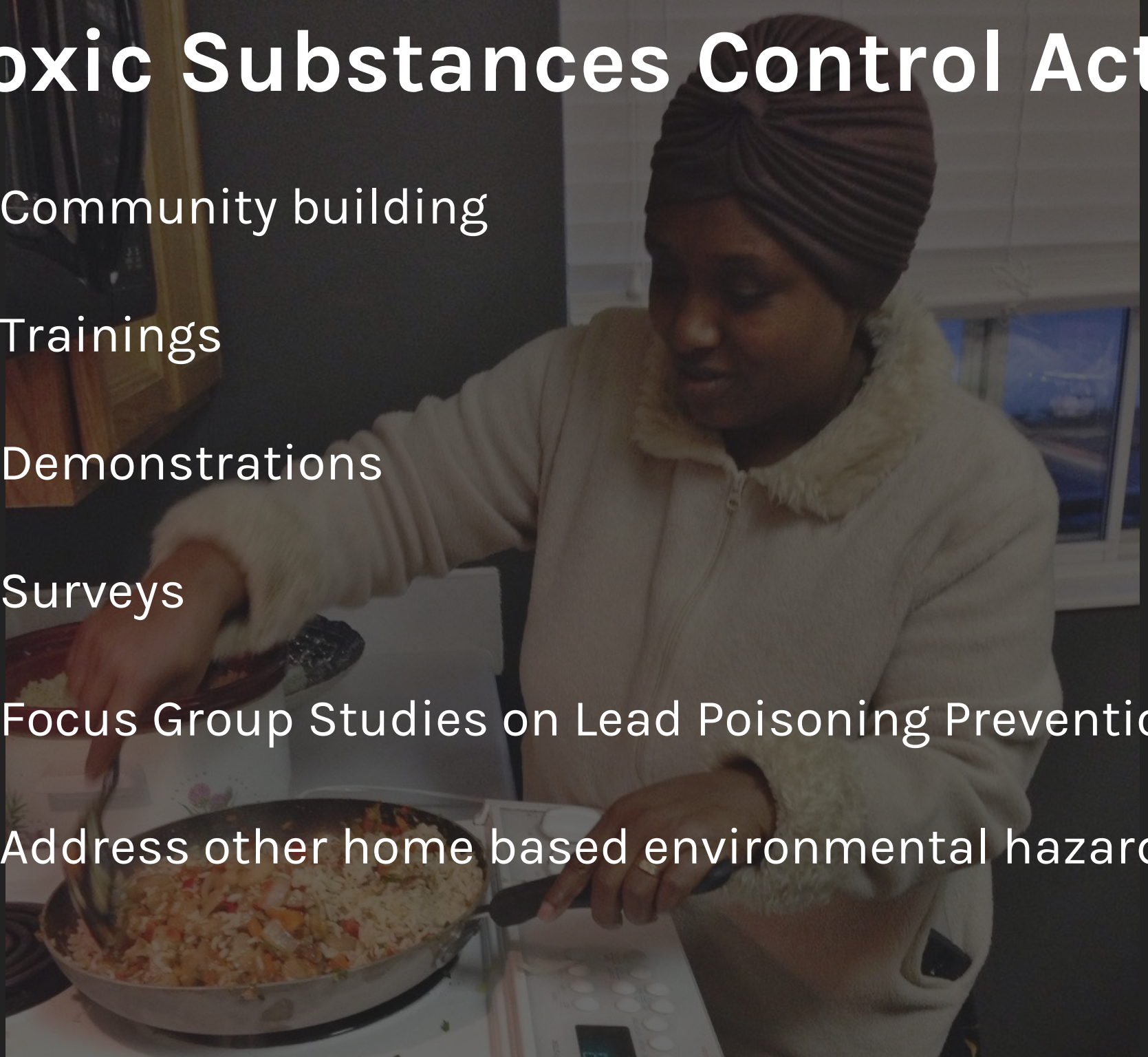
Our Project

- The Refugee Development Center
- Project Type
- Long Term Goals
- Background
- Partnerships
- Affected Community
- Plan Outline
- 3.0 Environmental Results

The Refugee Development Center

- Celebrated 15 Years
- Home visit program serves 600 people per year
- Parenting in Western Culture program serves 400 people per year
- After school tutoring reaches 500 youth
- In 15 years, 8,000 refugee have received in home education
- covering household safety, hygiene, cleaning, immunizations, primary care visits,and preventative screenings

Toxic Substances Control Act



- Community building
- Trainings
- Demonstrations
- Surveys
- Focus Group Studies on Lead Poisoning Prevention
- Address other home based environmental hazards

Long Term Goals

- 10% reduction in number of children experiencing EBLLs in Lansing, Michigan on and annual basis
- 20 % more local and federal lead testing and abatement resources invested in creating lead safe housing in the apartments and houses inhabited by refugees

Background

Current Situation

- Public Health, Nursing Case Management + over $6 million in lead abatement over the last 7 years
- 13% of children residing in the city tested wiht 1 EBLL >5 ug annually
- of the 150 -200 children w/ EBLL 2/3 were refugees
- 2/3 were living in rental housing

Barriers to Safe Housing

- Regional Shortage
- Lack of proficiency identifying and mitigating lead hazards and other housing related health hazards
- Lack of linguistically and culturally appropriate educational tools (literacy)

Community Partners

Working to make a visible difference in Communities

- Ingham County Health Department
- MSU College of Law
- Courtney Myers Keaton

Affected Community

- 20,000 refugees
- 60 countries: Somalia, DRC, Burma, Bhutan, Iraq, Sudan, and Eritrea
- 800 refugees resettle in Lansing
- Fleeing persecution
- Varying levels of education
- Lacking knowledge of U.S. social, cultural, educational, economic, employment, and housing systems and policies

Outline

1. Coordinate survey and focus group (75 refugee residents
2. Develop print, web, and video demonstration materials that are culturally and linguistically relevant
3. Pilot and evaluate efficacy of video demonstration and print/web materials among refugees (client driven response to video)
4. Modify materials, video demonstrations, and narration as needed
5. Integrate video and booklets into existing refugee home-visits and educational events and publicly promote the new tools. (600 in home visits and 25 of group educational events)

3.0 Environmental Results

- Refugee Healthy Homes Task Force
- Project Advisory Committee
- 75 refugees participate in focus groups
- 5 videos dubbed into top 6 refugee languages
- 3 print booklets translated into top 6 languages
- 1-2 pages of web content
- 25 refugees attended press conference and thank you receptions

Thank you!

Drinking Water in Chicago

Agua potable en Chicago

Agenda

- PERRO
- Lead in the Water
- Q/A

What is PERRO?

¿Cuál es PERRO?

- PERRO stands for:
  - **Pilsen Environmental Rights and Reform Organization**
- Grassroots community group
- Formed in 2004
- Fighting pollution in Pilsen
- Believe all people have the right to live in a clean and healthy environment, regardless of their race and class.
- Our mission is to spread awareness about this concept of environmental justice and make Pilsen a healthier place to live, work, and raise children.

What has PERRO done?

¿Que acciones ha tomado PERRO?

- **Soil Remediation Project in Pilsen**
- **Proyecto de rehabilitación de suelos en Pilsen**

What has PERRO done?

¿Que acciones ha tomado PERRO?

- **Soil Remediation Project in Pilsen**
- **Proyecto de rehabilitación de suelos en Pilsen**

What has PERRO done?

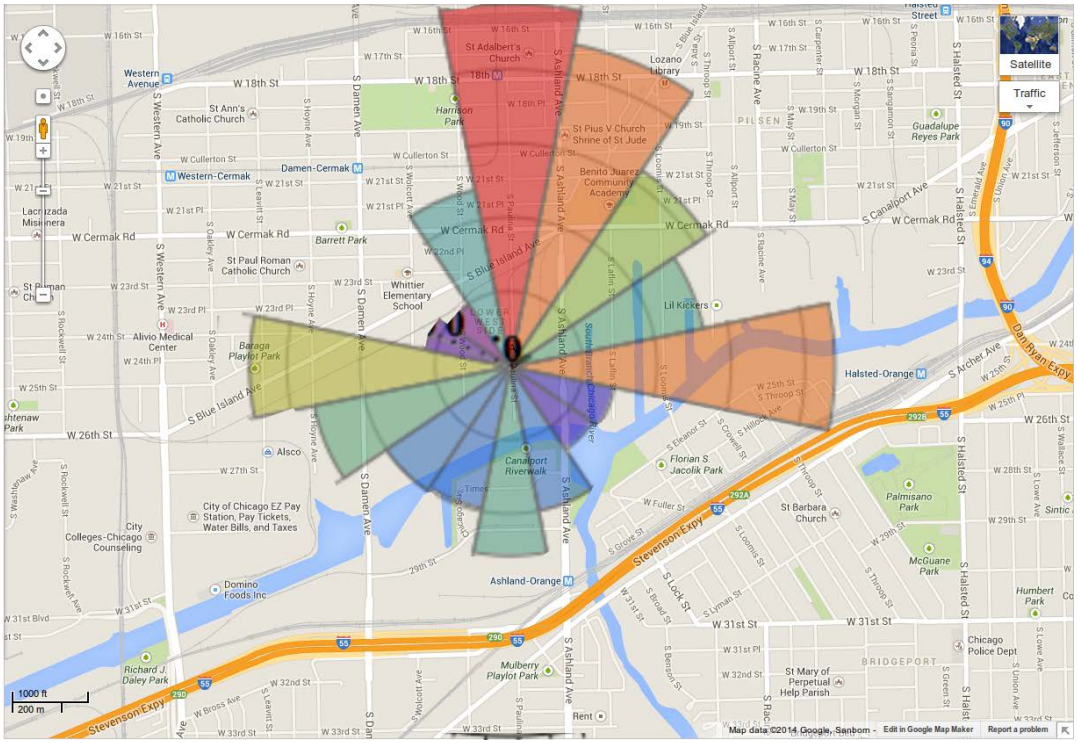
¿Que acciones ha tomado PERRO?

- **Coal-Fired Power Plants in Chicago**
- **Las plantas eléctricas de carbón en Chicago**

What has PERRO done?

¿Que acciones ha tomado PERRO?

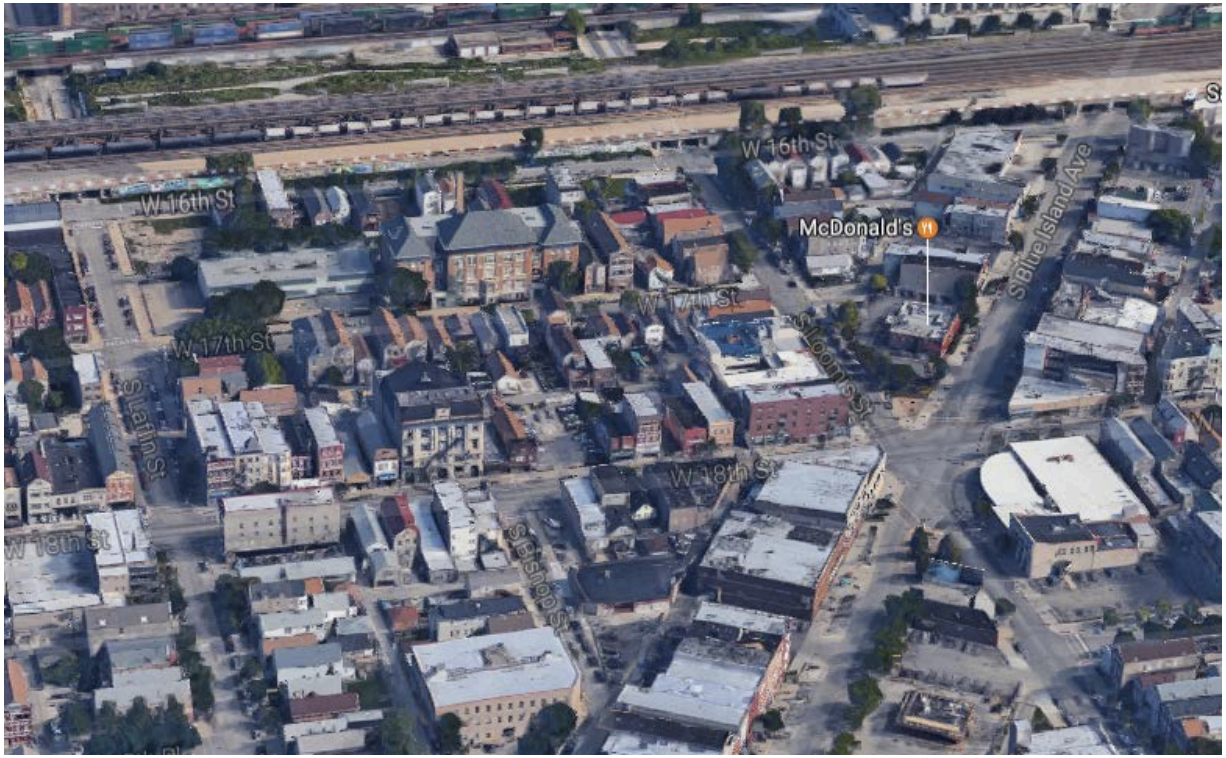
- **Metal Shredders in Pilsen**
- **Trituradoras de metal en Pilsen**



What has PERRO done?

¿Que acciones ha tomado PERRO?

- **Green space for Pilsen Academy**
- **Espacio verde para Pilsen Academy**

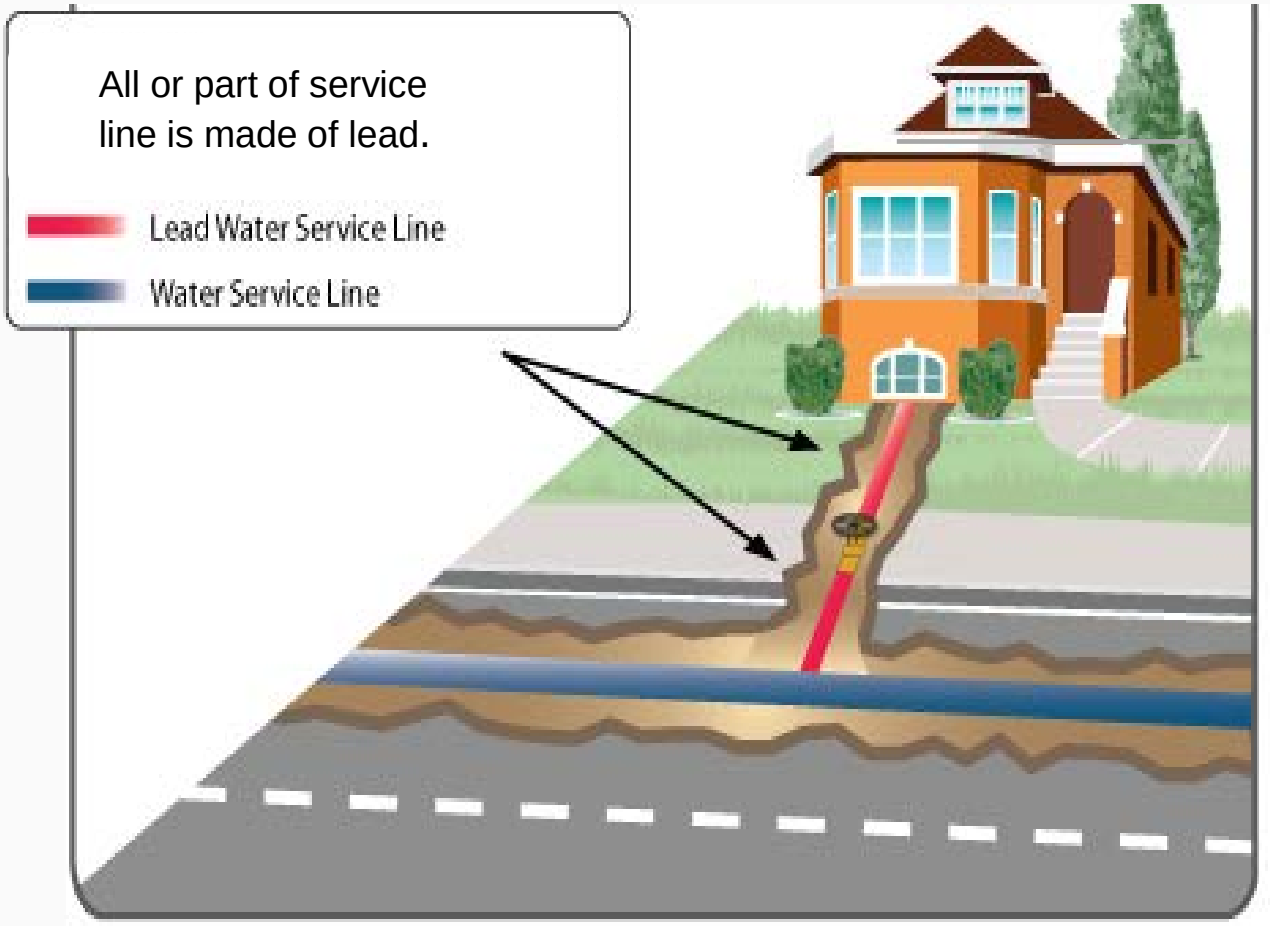


What has PERRO done?

¿Que acciones ha tomado PERRO?

- **Miguel Del Toral – EPA Lead Expert**

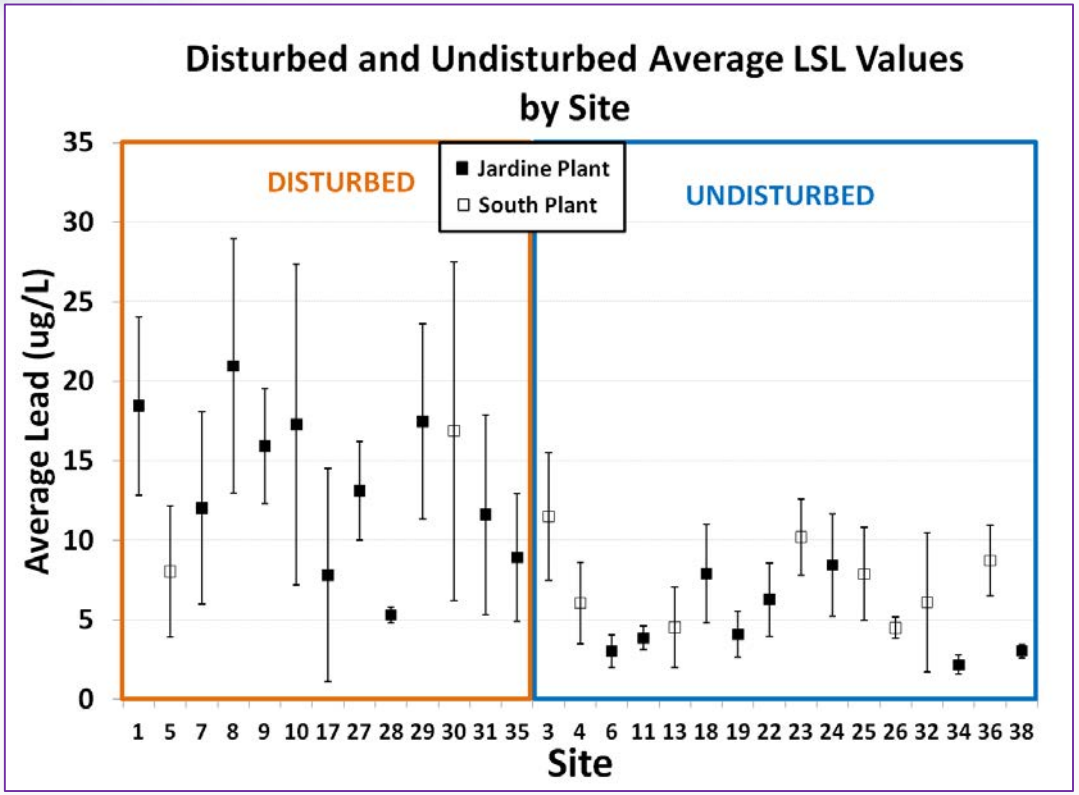
Study Findings



Disturbed LSL Sites had Highest Pb
What is a 'Disturbed LSL Site'?

Disturbed LSL Sites

- Street excavation in front of home (e.g., main replacement)
- External service shut-off valve repair/replacement
- Service line leak repair
- Meter installation or replacement
- Auto-meter-reader (AMR) installation



Indeterminate Sites	Total Samples Collected	No. Samples above Lead AL
12	27	17
21	27	7
33	27	6

What has PERRO done?

¿Que acciones ha tomado PERRO?

- **Drinking water in Chicago**
- **Agua potable en Chicago**

What did Dr. Jacobs Say?
¿Qué dijo el Dr. Jacobs?

- **Chicago has the worst lead abatement program in the country.**
- **Chicago tiene el peor programa de reducción del plomo en el país.**
- **We use you guys to test for lead!**
- **Utilizamos ustedes para poner a prueba para el plomo!**
- **Crime is correlated with lead exposure.**
- **El crimen está correlacionada con la exposición al plomo.**

What does PERRO want?

¿Qué quiere PERRO?

- **New water meters/water mains pose a threat.**
- **Nuevos medidores de agua / red de agua representan una amenaza.**
- **City is asking for volunteers to test their water.**
- **Ciudad está pidiendo voluntarios para probar su agua.**
- **Not enough!**
- **¡No es suficiente!**
- **Filters for lead should be provided to residents with disturbed service lines; i.e. new water meters/mains**
- **Filtros para el plomo deben ser proporcionados a los residentes con líneas de servicio perturbado; es decir, los nuevos medidores de agua.**

What can you do?

¿Qué puedes hacer?

- **If you live in a house or small building, let your water run for 5 minutes when you wake up or come home from school.**
- **Si usted vive en una casa o edificio pequeño, dejar que el agua de su marcha durante 5 minutos cuando se despierta o regresan de la escuela.**
- **If there was construction, get a water filter.**
- **Si había una construcción, obtener un filtro de agua.**
- **Call your Alderman.**
- **Llame a su regidor.**

What can you do?

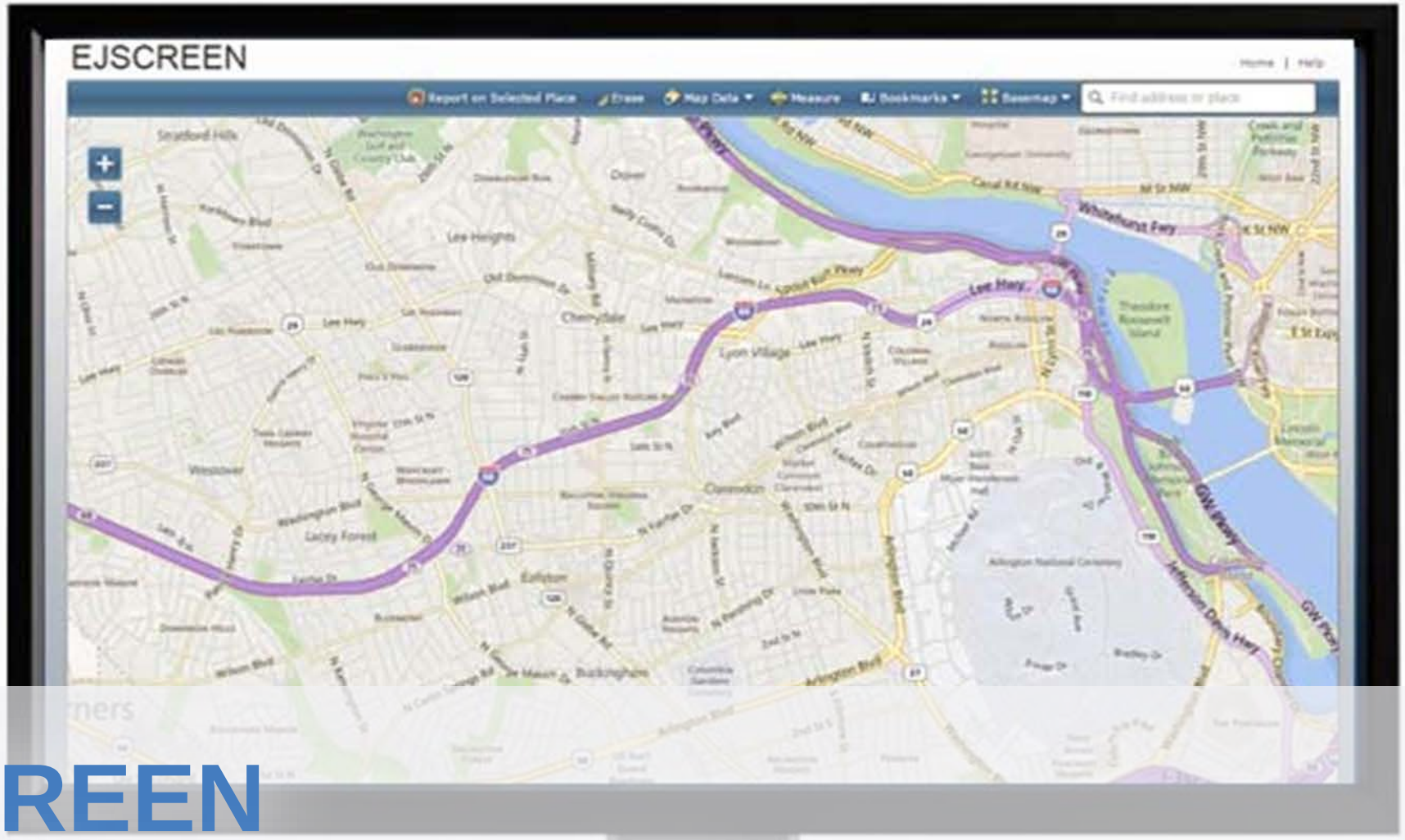
¿Qué puedes hacer?

https://danwahl.github.io/pipe-dream

Thank you!

¡Gracias!

- **Questions?**
- **¿Preguntas?**



EJSCREEN
EPA's Environmental Justice Screening Tool

Overview of the Presentation

EJSCREEN Background

Data in EJSCREEN

EJSCREEN Maps and Reports

How is EJSCREEN Used?

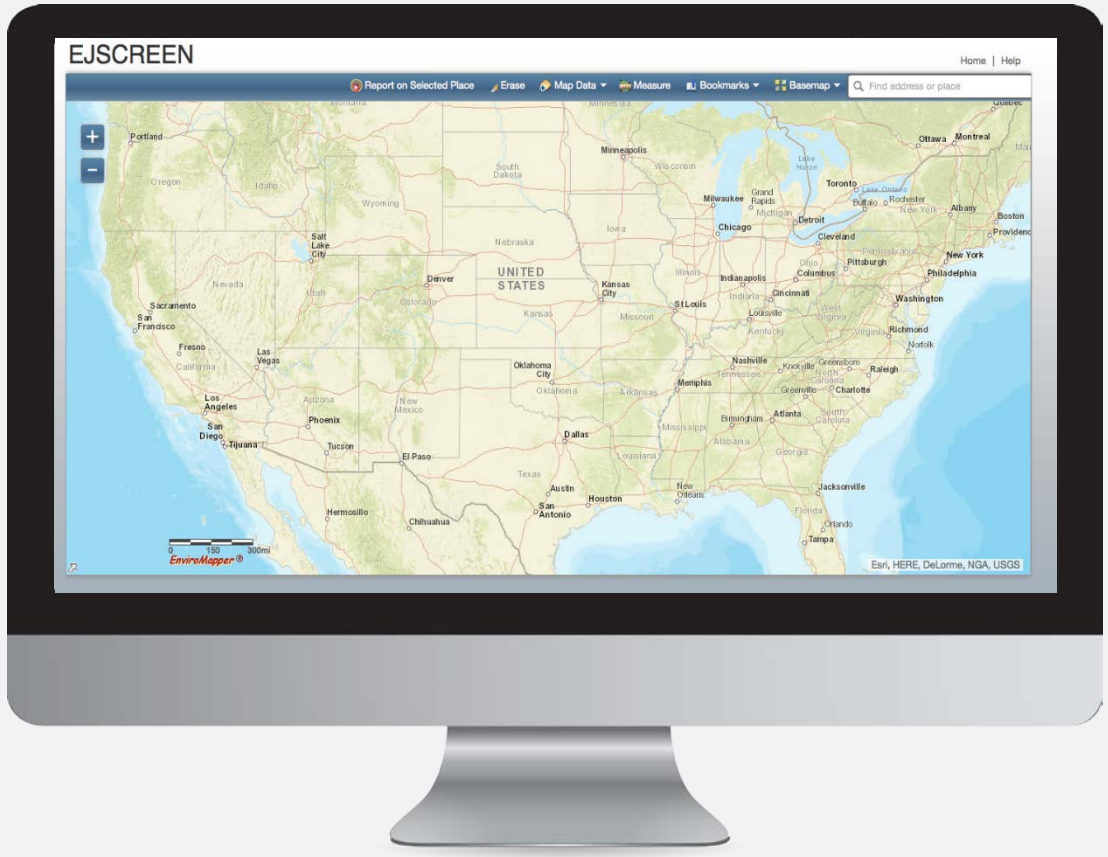
Future of EJSCREEN

Demonstration of Features in the Tool

EJSCREEN

EPA'S ENVIRONMENTAL SCREENING TOOL

EJSCREEN
Key Features



EJ Indexes

Combine demographic and environmental data to highlight vulnerable/susceptible populations

Annually Updated Data

from most recent U.S. Census Bureau American Community Survey (ACS).

Accessible and Intuitive

Standard printable reports, maps, and bar graphs

High Resolution Data

Census block group and tracts for units of analysis

Timeline on EJSCREEN Development

2010: EPA begins building nationally consistent EJ screening tool

2011: Commitment made in Plan EJ 2014

2011: National Environmental Justice Advisory Committee report released on EJ screening methods

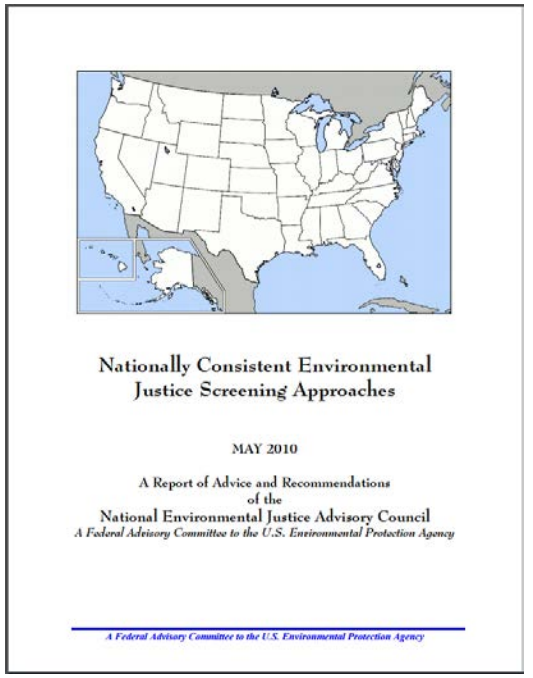
2012: EPA begins using EJSCREEN internally

2013: Peer reviewed by experts

2015: Interim version released to public

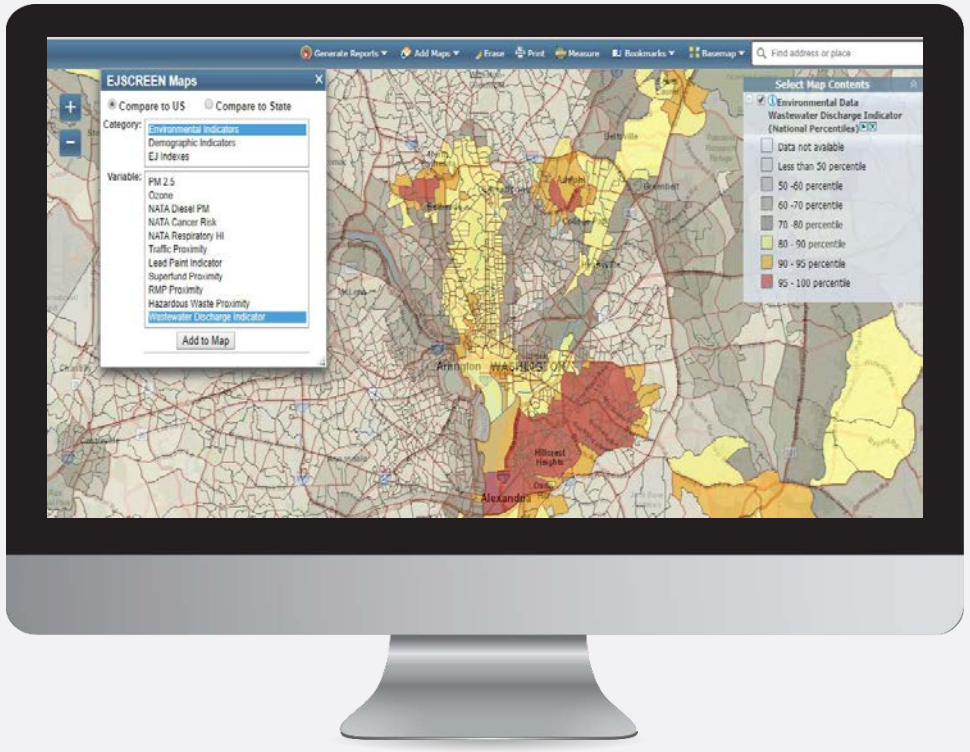
2016: Full version released to public

2017: Annual update



Click to read the full NEJAC report

New Features in EJSCREEN



Wastewater discharge indicator

- A revised water indicator that vastly improves user ability to screen for potential for surface water pollution
- The ability to look at municipalities as identified areas
- Revised map layers of schools
- New map layers on public housing and prisons
- Changes to underlying proximity calculations

Understand these caveats before using

- Environmental indicators are mostly screening-level proxies for actual exposure or risk.
- Indicators vary in vintage. Estimates are based on historical data. and may not reflect current or future conditions.
- EJSCREEN does not cover all environmental issues.
- EJSCREEN does not identify “EJ communities.”

EJSCREEN Data

UNITS OF ANALYSIS

United States

State

Primary governmental divisions of the United States.

County

Largest divisions within states.

Census Tract

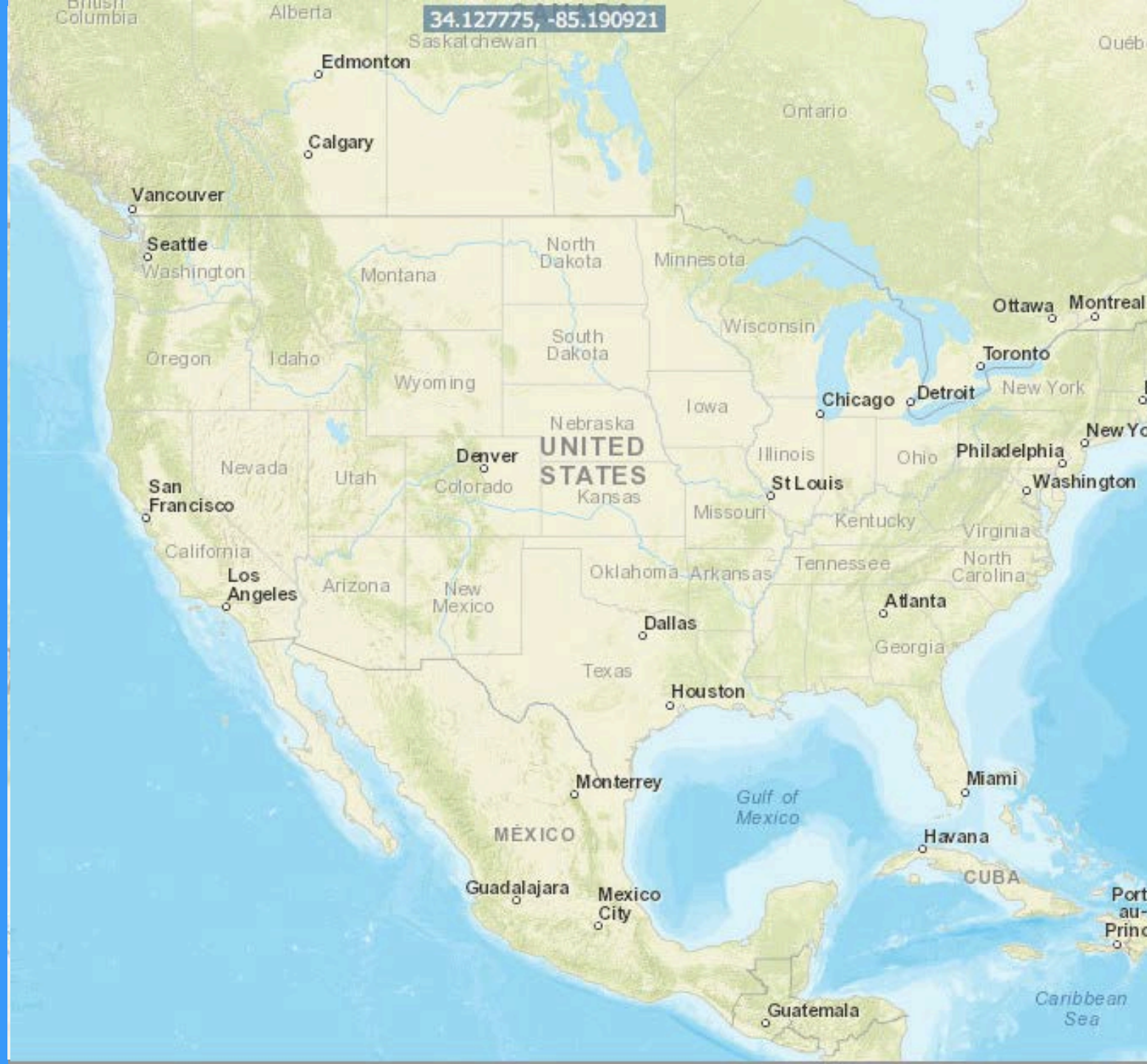
Collection of Census block groups, mostly between 1,200 and 8,000 people.

Block Group

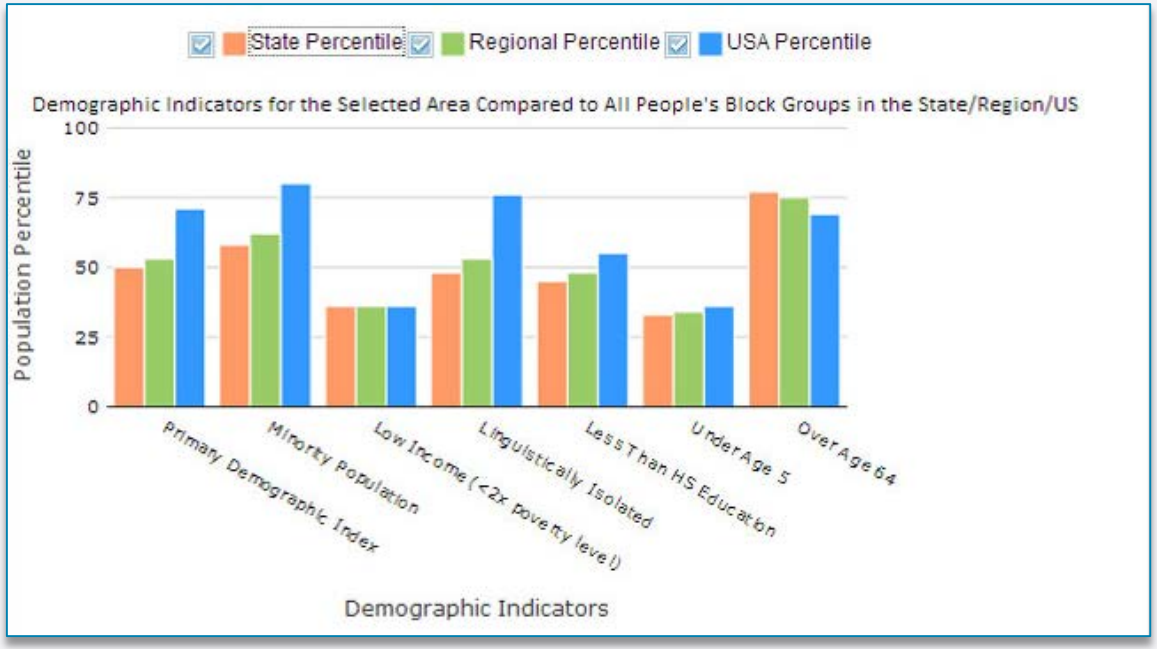
Collection of residential blocks, mostly, between 600 and 3,000 people.

Block

Residential block, bounded on all sides by streets.



Results are ranked as percentiles



- Percentiles put indicators into common units of 0 – 100.
- For example, a place at the 80th percentile nationwide means 20% of the US population has a higher value.
- Ranking values as percentiles allows comparison of indicators measured with different units. <u>It does not mean the risks are equal or comparable</u>.

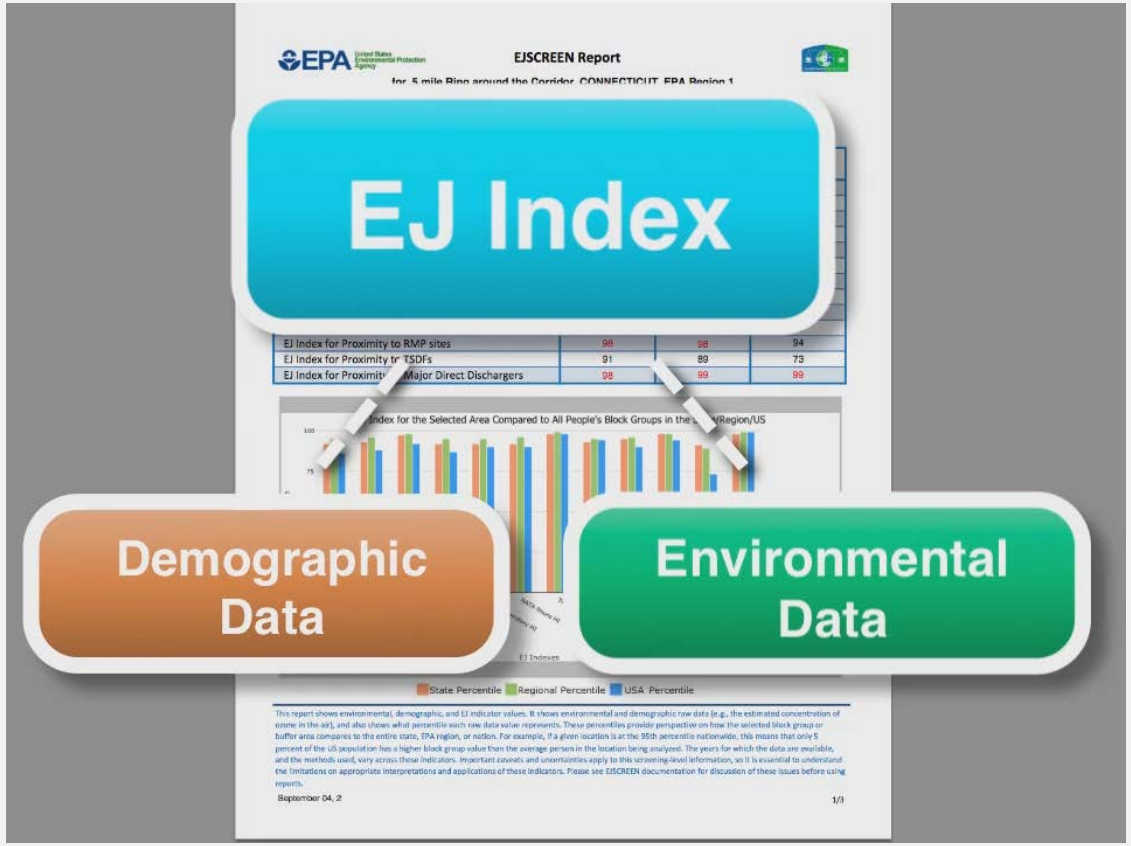
Demographic Indicators

Demographic Indicator	**Description** (Source: 2011 - 2015 ACS Estimates)
Low-Income	Percentage of block group population at or below twice the federal “poverty level”
Minority	All people other than non-Hispanic white-alone individuals
Less than high school education	Percentage of people age 25 or older without a high school diploma
Linguistic isolation	Percentage of people in household in which all members over age 14 years speak English less than “very well”
Individuals under age 5	Percentage of people under the age of 5
Individuals over age 64	Percentage of people over the age of 64

Environmental Indicators

Environmental Indicators	Year of Data
Particulate Matter (PM 2.5)	2013
Ozone	2013
NATA Diesel Particulate Matter	2011
NATA Air Toxics Cancer Risk	2011
NATA Respiratory Hazard Index	2011
Lead Paint Indicator	2011-2015
Traffic Proximity	2014
Proximity to Superfund (NPL) Sites	2016
Proximity to Risk Management Plan (RMP) Facilities	2017
Proximity to Treatment Storage Disposal Facilities (TSDFs)	2017
Wastewater Discharger Indicator	2017

EJ Indexes

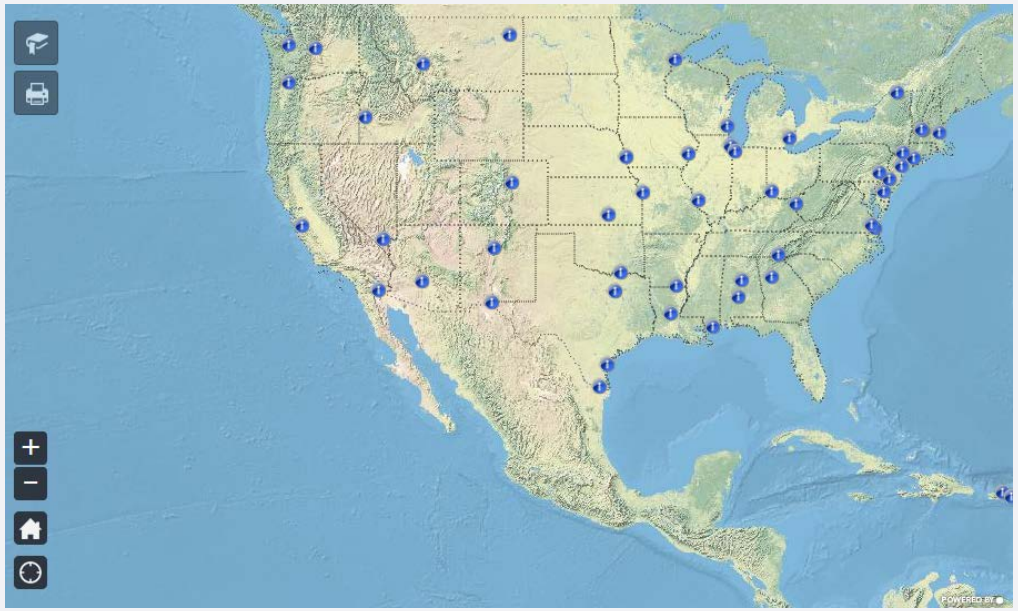


EJ indexes combine **environmental** and **demographic** data to highlight areas where vulnerable/susceptible populations may be disproportionately impacted by pollution.

Click here to watch a 5 minute video on how the EJ Indexes are constructed.

EJSCREEN in Action

- EJ analyses
- Community outreach
- Prioritization
- Evaluating areas for place-based work
- Education and research
- Retrospective reports



Click to see the locations of the 50 MVD communities

The Future of EJSCREEN

Future of EJSCREEN

- Continued public engagement and evaluation
- Continue incorporating into EPA programs, activities, resources
- Support partners looking to use EJSCREEN to consider environmental justice
- Improved training and access to learning materials
- Addition of map layers relevant to EJ communities
- Improved usability and accessibility

Contact Information

Question?

Demonstration

messersmith.mark@epa.gov

(312) 353-2154

Community-Focused Exposure and Risk Screening Tool (C-FERST)

Introduction and Demonstration

Kathy Triantafillou

EPA Region 5 – Office of Enforcement and Compliance Assurance

Overview

- Who, What and Why C-FERST?
- View the C-FERST Homepage & Discuss Limitations
- Map Services and Map Layers
- View A Community Map
- Additional Data Tools
- Explore an Environmental Issue Profile
- Community Data Tables

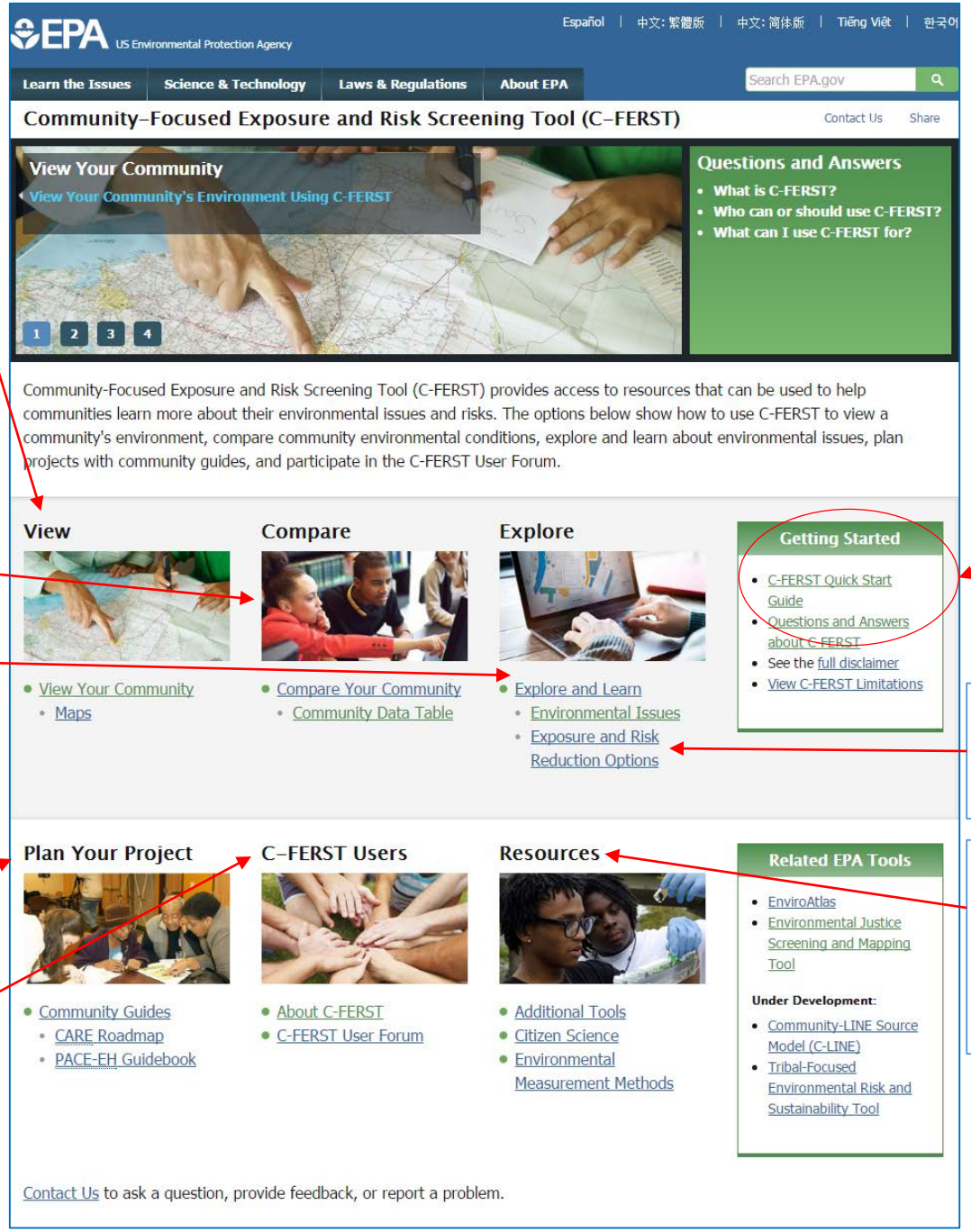
Who, What and Why C-FERST?

- **What is C-FERST?** *An online tool that gives communities access to resources and information about their environmental issues and exposures.*

- **Why C-FERST?** *Empowers communities with online resources to help them identify and learn more about their environmental issues, and explore exposure and risk reduction options.*

- **Who Should Use C-FERST?** *Government (Local, State & Federal), Professionals & Academics, and Public Leaders & Organizations.*

http://www.epa.gov/c-ferst



What's it look like in our community? View Maps

How does my community compare with County and State conditions?

Explore Those environmental issues

Plan Your Project Using Community Guides with C-FERST

C-FERST Users Information About C-FERST Connect with the User Forum

Where to Start? Quick Start Guide shows the basics

What can we do about it? Exposure and Risk Reduction options

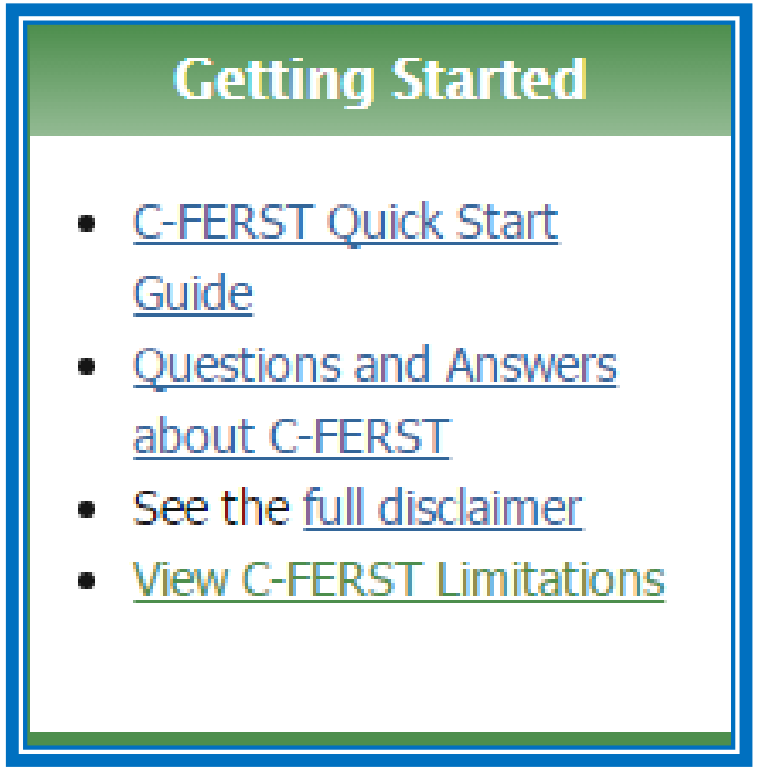
More Resources Other Tools, Citizen Science, Environmental Measurement Methods

Limitations

- C-FERST is intended for screening purposes, and should not be used as the sole basis to characterize risk or make decisions regarding public health

Limitations

- Does not show every risk
- Geographic coverage
- Accuracy and time frame
- Does not calculate or modify risk estimates



Map Services and Map Layers

- EPA Registered Facilities (Sites)
- National Emissions Inventory by Pollutant (2011)
- Water Quality Inventory Report (305b)
- BEACH Environmental Assessment and Coastal Health
- Permitted Water Discharge Sites (NPDES)
- STORET Water Monitoring Sites
- Impaired Waters with TMDLs
- Schools

- Neighborhood Boundaries
- Tribal Boundaries
- Federal and State Boundaries
- Demographic Data 2008-2012
- National Air Toxics Assessment (NATA) 2011
- Nonattainment Areas of Air
- Air Quality Predictions 2012
- EPA Smart Location Database
- AIRNow Air Quality Index

https://www.epa.gov/c-ferst

View

- View Your Community
  - Maps

Additional Tools to Complement C-FERST

- Additional Tools from EPA

- EJSCREEN: Environmental Justice Screening and Mapping Tool
- EnviroAtlas
- Environmental Dataset Gateway
- Environmental Health Resources for Community Members
- EPA for State and Local Governments
- EXPOsure toolBOX (EPA ExpoBox)
- Healthy Schools, Healthy Kids and Creating Healthy Indoor Air Quality in Schools
- MyEnvironment
- Methods, Models, Tools and Databases
- National Air Toxics Assessment (NATA)
- National Environmental Policy Act - NEPAssist
- Pollution Prevention (P2)
- Predictive Models and Tools for Assessing Chemicals under the Toxic Substances Control Act (TSCA)
- Risk-Screening Environmental Indicators (RSEI) Model
- Risk Assessment
- Smart School Siting Tool
- Smart Growth
- Toxics Release Inventory (TRI) Program
- Water Data and Tools

- Additional Tools from Other Federal Agencies
- Additional Tools from Other Organizations

Additional Resources

- Additional Tools
- Citizen Science
- Environmental Measurement Methods

General Information

- EPA Lead Homepage
- Lead Air Pollution and Lead Trends
- Basic Information about Lead in Drinking Water
- Water Topics
- Learn about Lead
- Indoor Air Quality: Lead in Older Homes
- Check Your Home

Sources

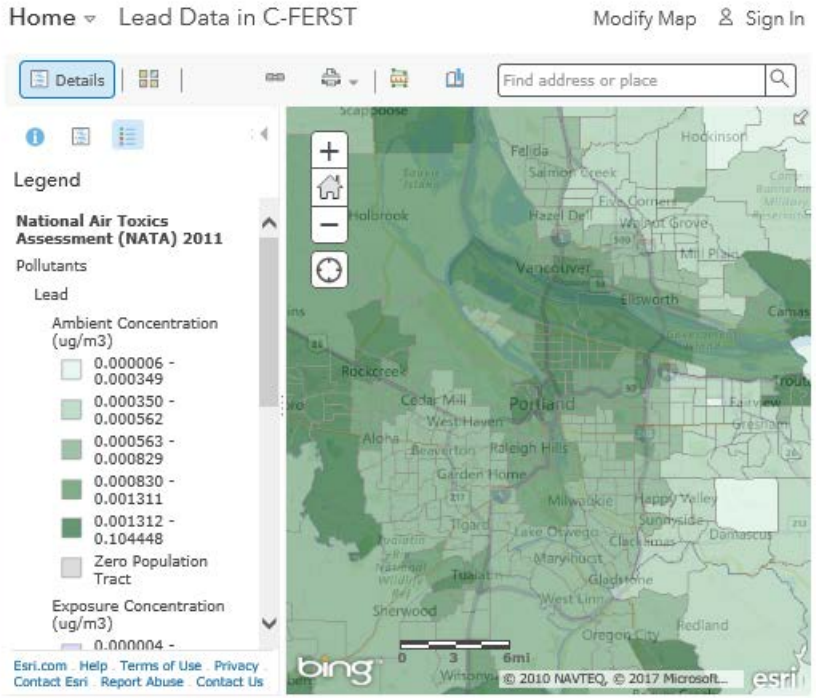
- Sources of Lead at Home
- Basic Information about lead in Drinking Water
- Private Drinking Water Wells
- Lead in Outdoor Air
- Search TRIExplorer for Reports on Lead Releases from Stationary Sources
- EPA Report on the Environment: Lead Emissions
- ToxTown: National Institute of Health: Lead
- U.S. Department of Health and Human Services Household Products Database: Prod
- Centers for Disease Control and Prevention's Lead Tips: Sources of Lead

Explore

- Explore and Learn
  - Environmental Issues
  - Exposure and Risk Reduction Options

Environmental Concentrations, Human Exposures and Health Risks

Interested in learning more about a specific location? Type an address, city or ZIP code into the box on the right side of the map below. Click on the map to see a pop-up with information about ambient concentration, exposure concentration and cancer risk for the chosen location(s). Navigate to the next feature by clicking the small arrow(s) on the top right side of the pop-up.



- Integrated Risk Information System (IRIS): Lead and Lead Compounds Summary
- Health Effects of Lead
- Hazardous Air Pollutants: Lead Compounds Summary (PDF) (4 pp, 155 K, About PDF)
- Agency for Toxic Substances & Disease Registry's Toxic Substances Portal: Lead
- NTP 14th Report on Carcinogens Substance Profile: Lead and Lead Compounds (PDF) (4pp, 161KB, About PDF)
- EPA Report on the Environment: Ambient Lead Concentrations
- EPA Report on the Environment: Blood Lead Levels
- Centers for Disease Control and Prevention's (CDC) Childhood Lead Poisoning Data, Statistics, and Surveillance
- CDC Environmental Public Health Tracking: Childhood Lead Poisoning and the Environment
- CDC: Lead Information

Exposure and Risk Reduction Options

- Protect Your Family from Lead
- Real Estate Disclosure: Know Your Rights before you Buy, Rent, Sell or Lease
- Evaluating and Eliminating Lead-Based Paint Hazards: Lead Abatement, Inspection, and Risk Assessment
- Guidance and Tools for Reducing Lead in Drinking Water in Schools and Child Care Facilities
- Documents and Outreach Materials
- Renovation, Repair and Painting Program
- Lead Home Danger Zone Finder
- New Bioavailability Testing Methods for Lead and Arsenic in Soil (4th option under GEMS: Great Environmental Moments in Science)
- Soil Bioavailability at Superfund Sites: Guidance
- Centers for Disease Control and Prevention (CDC) Lead Prevention Tips
- CDC Lead Prevention Tips for At Risk Populations
- CDC Childhood Lead Poisoning Prevention Program Community Awareness Project (CLPPP CAP)
- CDC's HHLPSS: Healthy Homes and Lead Poisoning Surveillance System
- US Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

Strategies Implemented By Other Communities

- Colorado: Groundwork Denver / Healthy Air for Northeast Denver - Fact Sheet and Final Report
- Massachusetts: Boston Public Health Commission - Final Report
- Michigan: Muskegon County Environmental Coordinating Council - Final Report
- Montana: Montana Indian Country CARE Project - Final Report
- New York: Center of Environmental Information - Fact Sheet and Final Report
- Arizona: Community Assist of Southern Arizona and the Sonora Environmental Research Institute - Final Report
- Michigan: West Michigan Environmental Action Education Foundation - Summary
- Texas: City of Laredo Health Department - Summary
- Georgia: Harambee House, Inc. / Citizens for Environment Justice - Fact Sheet and Final Report
- Alaska - Nunakauyarmiut Tribe Protecting our Health - Summary
- Colorado: Citizens for Clean Air in Pueblo - Final Report
- Indiana: Gary CARE Partnership Project - Final Report
- Michigan: Healthy Homes-Healthy Business Project - Summary
- Kansas: Environmental Sustainability for the Salina Community - Summary
- The Fishbone Project for a Lead-Safe community: West Oakland Lead Cleanup (PDF) (2pp, 215KB, About PDF) EXIT
- Tribe-to-Tribe: The Quapaw Tribe of Oklahoma and The Tar Creek Project (PDF) (33pp, 1MB, About PDF) EXIT
- Tribe-to-Tribe: St. Regis Mohawk Tribe Metals Air Quality EXIT

Compare

- Compare Your Community
  - Community Data Table

Indicators and Indices	Tract 401300	Madison County	Illinois	Data Info/Notes
▼ Environmental Concentration Estimates				
Outdoor Air - Acetaldehyde (µg/m³)	2.3	2.2	1.8	2011 NATA
Outdoor Air - Acrolein+ (µg/m³)	0.02	0.02	0.01	2011 NATA
Outdoor Air - Arsenic (µg/m³)	0.0003	0.0001	0.0001	2011 NATA
Outdoor Air - Benzene (µg/m³)	0.6	0.5	0.5	2011 NATA
Outdoor Air - Butadiene (µg/m³)	0.04	0.04	0.03	2011 NATA
Outdoor Air - Chromium (µg/m³)	0.0002	0.0001	0.0001	2011 NATA
Outdoor Air - Diesel PM (µg/m³)	0.8	0.9	0.7	2011 NATA
Outdoor Air - Formaldehyde (µg/m³)	1.79	1.76	1.29	2011 NATA
Outdoor Air - Lead (µg/m³)	0.009	0.002	0.001	2011 NATA
Outdoor Air - Naphthalene (µg/m³)	0.05	0.04	0.02	2011 NATA
Outdoor Air - PAH (µg/m³)	0.002	0.002	0.002	2011 NATA
▶ Human Exposure Estimates				
▶ Health Risk Estimates				
▶ Demographic, Social and Economic Indicators				

For Questions

www.epa.gov/c-ferst

Contact us

- C-FERST User Forum

Kathy Triantafillou

Triantafillou.Kathy@epa.gov

312-353-4293

Flint Water Crisis
Lessons Learned

Lauren Eiten
Public Affairs Specialist
Office of the Regional Director
U.S. Department of Health and Human Services
September 26, 2017

Congressional Aid

- At the end of December, Congress passed an aid package that provides funding to Flint and other cities with lead issues.
- Funding for Flint supports:
  - Safe Water Drinking Act State Revolving Loan Fund
  - Water Infrastructure Finance and Innovation Act loans
  - Lead exposure registry
  - Childhood Lead Poisoning Prevention Program
  - Healthy Start Program

CDC Registry

Registry tracks impacts of lead exposure on Flint residents throughout their lifetimes.

- CDC announced at the end of July that Michigan State University will receive over $14 million over the next 4 years

- This funding will help the community monitor health outcomes among registrants for years to come and will be extremely valuable in evaluating the effectiveness of available health, educational, environmental, and community services.

Healthy Start

At the end of June, HRSA awarded nearly $15 million for the Genesee County Healthy Start Program

- Provides health and social services for women, infants, and their families who have had, or are at risk, for lead exposure in Flint and the surrounding community.

- In partnership with other community organizations including the school district, the local health coalition, federally qualified health centers, hospitals, higher education institutions, and the City.

SAMHSA Mental Health

To help respond to the emotional distress

- SAMHSA awarded a $475,194 Emergency Response Grant
- ASPR provided psychological first aid training, including train-the-trainer sessions in February 2016.

To help build resiliency

- SAMHSA awarded a nearly $5 million ReCast grant to the City of Flint to help the community recover from and build resiliency from this trauma.

Outreach

Care for Flint Campaign

- HHS organized NGOs, state, and local government to launch informational campaign called “Care for Flint.”

Joint EPA-HHS Public Engagement Team

- In an effort to jumpstart outreach, 4 HHS employees, a number of rotating EPA staff, and two USDA-FNS worked in the community for 8 weeks during the summer.
- Attended over 30 community events to speak with and listen to almost 4,000 residents

Messaging

Sometimes overlooked but crucial element to any community program

- Words matter
  - Targeted Case Management ➡ Family Support Services
- Special Populations
  - Really important for everyone to get info at the same time
- Community Communication Group/Vetting Group
  - Ensure representation from special populations
  - Helps instill trust in the documents
- The Basics
  - Infographics are your friend
  - Keep it between a 3rd-5th grade reading level
  - Know your target audience
  - Double check your phone numbers

THANK YOU

Lauren Eiten
Lauren.eiten@hhs.gov
312-886-2896
Public Affairs Specialist
Office of the Regional Director
U.S. Department of Health and Human Service

- Recent Blog Posts
- All Blog Posts
- Grant Opportunities
- Federal Register Documents
- FNCS Recipe Box
- Food & Nutrition RSS Feeds
- USDA Press Releases
- FNS Infographics
- Media Center

Federal Nutrition Programs: Reducing the Impact of Lead Exposure

Print

Lead exposure – via water, soil, or another medium – is a public health problem affecting people across our nation. Exposure to unsafe levels of lead can cause serious health effects, especially among children. Immediate and widespread action is critical. The nutrition assistance programs administered by USDA's Food and Nutrition Service (FNS) may help lessen the negative impacts of lead exposure by using nutrition as a tool which may mitigate lead absorption.

In the fact sheets below, you will find tips for State and local governments, agencies, and community leaders on how FNS programs can be leveraged in the event of a lead crisis in two major ways: 1) Promoting balanced diets featuring key nutrients and 2) helping ensure access to safe drinking water.

- Promoting Balanced Diets Featuring Key Nutrients
- Helping Ensure Access to Safe Drinking Water

In addition, other Federal and State government sources have existing materials on preventing and/or mitigating lead exposure available in several languages. Check out:

- Michigan Department of Health and Human Services
- Environmental Protection Agency
- Centers for Disease Control and Prevention

Nutrition and Lead – Critical Connection

- Overall healthy diet emphasizing:
  - Vitamin C
  - Iron
  - Calcium
- May help mitigate lead absorption

SNAP and Lead Exposure Response

- Participants – especially in affected areas – encouraged to purchase nutritious foods
  - Farmers Markets
- Nutrition education for participants and families
- SNAP-Ed funding for policy, systems, and environmental interventions that increase access to foods containing the key nutrients
- SNAP-Ed Connection: Lead Poisoning and Nutrition


SIGN UP
HERE!


FRESH


DOUBLE UP FOOD
BUCKS VENDOR

For more information…

- FNS Fact Sheet - Leveraging Federal Nutrition Programs: Reducing the Impact of Lead Exposure
- MSU Extension Fact Sheet – Fight Lead with Nutrition
  - Also available in Spanish, Mandarin, and Arabic
- United Dairy Council's Lead & Nutrition Resources Webpage
- Fuel Up to Play 60
- Great American Milk Drive
- Michigan Government: Taking Action Resource Guide
- Well Fed Means Less Lead
  - Also available in Spanish, Arabic
- CDC - Lead and Pregnancy
- EPA Lead and a Health Diet – What You Can Do to Protect Your Child
- WIC Works – Lead Poisoning Prevention
- MDHHS Childhood and Lead Poisoning Prevention Program
- CDC Lead Exposure in Pregnant and Lactating Women
- Michigan Breastfeeding Network – Breastfeeding and Lead Exposure
- Michigan Government: Breastfeeding and Lead Exposure: FAQs
- Michigan Nutrition Network
- Michigan Fitness Foundation Recipes

THE IMPACT OF HOUSING QUALITY ON HEALTH

Office of Lead Hazard Control and Healthy Homes
U.S. Department of Housing and Urban Development
Paul Diegelman, Healthy Homes Representative
Regions V

What is OLHCHH?

- The Office of Lead Hazard Control and Healthy Homes (OLHCHH) is an office within the Department of Housing and Urban Development (HUD) that protects children and families from health and safety hazards in housing.
- The Office was established in 1991 as the Office of Lead-Based Paint Abatement and Poisoning Prevention.
- The Office began its healthy homes programs in FY 1999.
- The Office currently has 4 divisions, plus front office staff:
  - Programs Division
  - Grants Services Division
  - Policy and Standards Division
  - Program and Regulatory Support Division

Why Does the OLHCHH's Work Matter?

- It helps children and other vulnerable populations reach their full potential by:
  - Preventing injuries and diseases;
  - Lowering healthcare costs;
  - Increasing school and work performance; and
  - Decreasing the number of school and work days missed due to injuries and diseases.

- It frees up family expenses that would have been spent on healthcare for other critical needs, such as rent or nutritious food.

- It saves money and lives.
  - Studies have shown that lead and healthy homes interventions are *effective* and are more *cost-effective* than conventional maintenance.

(*See* Maqbook et al., 2015; Gould, 2009)

Lead

- Lead poisoning is entirely preventable through remediation.
- Once a child has been poisoned, the impairment it causes may be irreversible:
  - Reduced IQ
  - Behavioral problems
  - Learning disabilities
- There is no safe blood lead level.

(*See* Gould, 2009; CDC, 2015)

Healthy Homes

- Lead is a major public health problem, but focusing **only** on addressing lead hazards is not the best use of resources.
- Many housing-related health hazards share common problems.
- Overall health and wellness is based on many factors.
- Prevention requires identifying and correcting those causes of illness to increase overall health and wellness.

***Healthy Homes Model, from* Advancing Healthy Housing: A Strategy for Action**

(*See* Office of the Surgeon General, 2009)

Return on Healthy Homes Investments

Inputs	Return on Investment (ROI)	Outcomes
*For every $1 spent on **asthma reduction** programs*[1]	*…there is a return of between $5.30 and $14.00.*	• Reduced healthcare costs • Increased school attendance • Increased employment attendance • Increased income due to attendance • Fewer deaths
*For every $1 spent on **lead hazard control** programs*[2]	*…there is a return of between $17 and $221.*	
*For every $1 spent on **radon mitigation** programs*[3]	*…there is a return of $4.95.*	

1. Nurmagambetov et al., 2011
2. Gould, 2009
3. Healthy Housing Solutions, 2014

What Does OLHCHH Do Now?

Grants for Producing Lead-Safe and Healthy Housing Units

- OLHCHH provides and monitors funding to states and local governments to produce lead-safe and healthy low-income privately-owned housing units

Technical Studies Grants (a.k.a. Research Grants)

- OLHCHH provides and monitors funding to grantees to research methods, costs, and health benefits of making homes safe and healthy

Enforcement

- OLHCHH enforces the Lead-Based Paint Disclosure Rule and works with HUD program offices on compliance with the Lead Safe Housing Rule

Guidance and Performance Criteria

- OLHCHH develops and promotes development of healthy homes guidance and performance criteria

Outreach

- OLHCHH provides education and resource materials to homeowners, tenants, and stakeholders on how to make homes safe and healthy

OLHCHH Grant Programs

- **Grants for Producing Lead-Safe and Healthy Housing Units**
  - 2 grant programs:
    - Lead Based Paint Hazard Control Grants
    - Lead Hazard Reduction Demonstration Grants
  - Grantees (“Lead & Healthy Homes Grantees”)
    - Grantees of these programs are state, local, or tribal governments.

- **Technical Studies Grants (a.k.a. Research Grants)**
  - 2 grant programs:
    - Healthy Homes Technical Studies Grants
    - Lead Technical Studies Grants
  - Grantees (“Technical Studies Grantees”)
    - Grantees are academic institutions, research firms, and state, local, and tribal governments.

ILHHU0029-15	Sinai Health System	2015	11/1/2017
ILLHB0590-14	City of Kankakee	2014	11/30/2017
ILLHB0595-15	County of Peoria	2015	10/14/2018
ILLHB0625-16	Winnebago County	2016	10/16/2019
ILLHD0270-14	City of Chicago	2014	12/14/2017
ILLHD0301-16	Cook County Department of Health	2016	
INHHU0026-14	Purdue University	2014	12/31/2017
MILHB0573-14	County of Muskegon	2014	12/14/2017
MILHB0596-15	State of Michigan	2015	10/14/2018
MILHB0609-16	City of Grand Rapids	2016	10/16/2019
MILHD0266-14	City of Detroit	2014	11/30/2017
MILHD0302-16	City of Lansing	2016	12/14/2019
MNLHB0581-14	City of Minneapolis	2014	11/30/2017
MNLHD0279-15	Hennepin County	2015	11/15/2018
OHHHU0027-14	University of Cincinnati	2014	11/30/2017
OHLHB0582-14	City of Cincinnati	2014	3/1/2018
OHLHB0597-15	State of Ohio	2015	11/1/2018
OHLHB0599-15	Cuyahoga County	2015	11/15/2018
OHLHB0610-16	Mahoning County	2016	10/2/2019
OHLHB0616-16	County of Erie (OH)	2016	10/16/2019
OHLHB0619-16	Summit County	2016	10/16/2019
OHLHD0272-14	City of Columbus	2014	11/30/2017
OHLHD0276-15	City of Cleveland	2015	11/1/2018
OHLHD0282-15	City of Akron	2015	10/14/2018
OHLHD0299-16	City of Columbus	2016	10/16/2019
WILHD0265-14	City of Milwaukee	2014	11/30/2017
WILHD0267-14	Kenosha County	2014	11/30/2017
WILHD0290-16	City of Milwaukee	2016	10/31/2019

2017 GRANTEES

Indiana	State of Indiana	$3,400,000
Michigan	Charter County of Wayne	$2,900,000
	City of Jackson	$2,900,000
Minnesota	City of Minneapolis	$2,900,000
	Hennepin County	$3,400,000
Ohio	City of Cincinnati	$3,400,000
	City of Cleveland	$3,400,000
	City of Toledo	$2,900,000
	Cuyahoga County	$2,900,000
Wisconsin	Kenosha County	$3,300,000

Technical Studies Grants: Some Key Results

Asthma: U. of Cincinnati researchers found that mold exposure at 1 yr. of age was associated with the development of asthma by age 6.

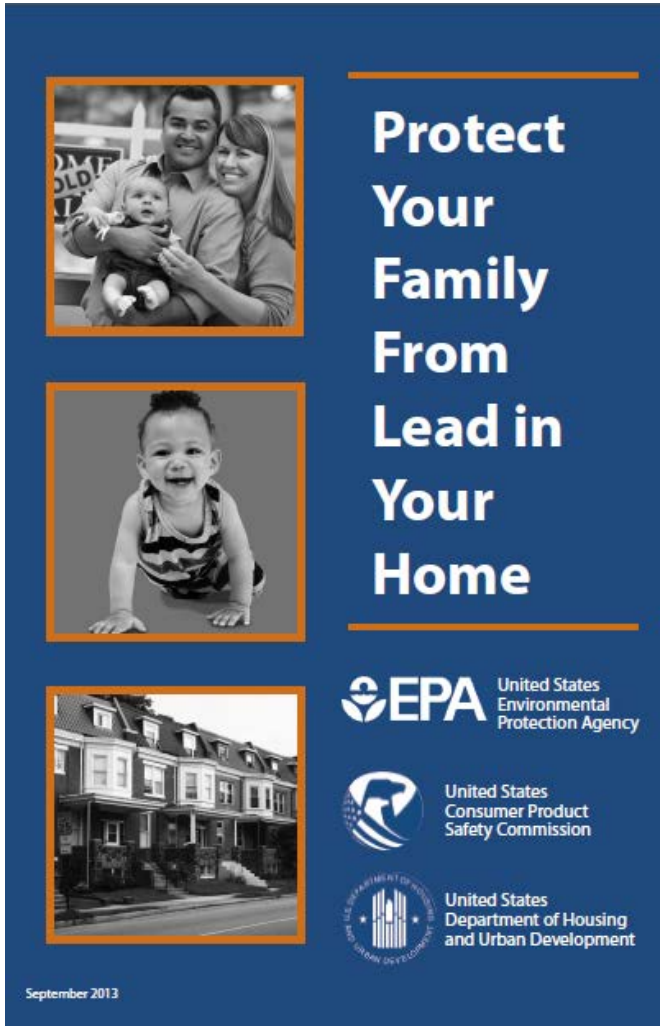
Fall prevention: Washington U. researchers showed that select low-cost home interventions reduced falls among high risk, low income seniors

Green construction: Harvard U. investigators reported lower levels of IAQ contaminants and reduced “sick building syndrome” among residents in units that had undergone green rehab.

Technical Studies Grants: Some Key Results

- Weatherization + Healthy Homes Interventions: National Center for Healthy Housing showed that combined Weatherization / Healthy Homes interventions improves children's asthma control and caregivers' quality of life.
- Lead Hazard Control: NCHH demonstrated long-term value of window replacement in reducing dust-lead levels and importance of conducting post-intervention clearance on attached porches.

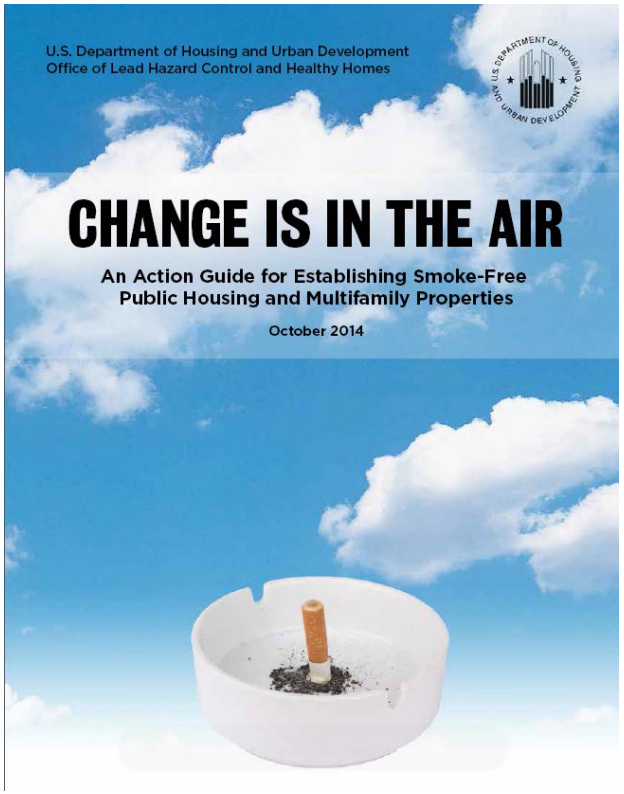
Lead Regulatory Enforcement



- The Program and Regulatory Support Division:
  - Enforces the **Lead-Based Paint Disclosure Rule** re sale or lease of pre-1978 housing
  - Works with units HUD program offices on **Lead Safe Housing Rule** compliance in pre-1978 HUD-assisted housing
- OLHCHH's enforcement efforts have resulted in:
  - Over **188,000** made lead-safe
  - Almost **$1.5 million** in penalties
  - In at least **20** states since **1999**

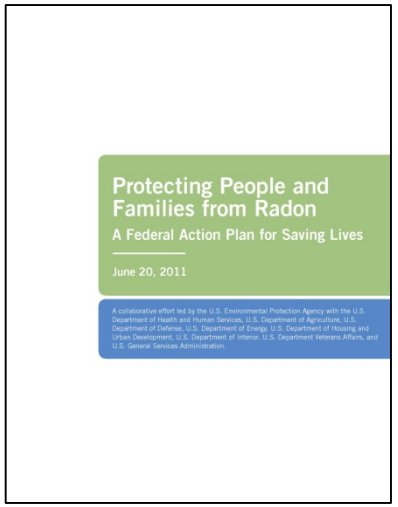
Cross-Cutting Initiatives

- **Smoke-free Public Housing**
  - OLHCHH and HUD's Office of Public and Indian Housing are working together to promote smoke-free public housing, with guidance since 2009.
  - PIH proposed a rule on 11/17/2015 to make public housing smoke-free (comments due 1/19/2016).
  - OLHCHH and PIH developed smoke-free tool kits for public housing agency management and residents.
  - OLHCHH-PIH "Change is in the Air" Action Guide:
- **Medicaid Reimbursements for Lead Poisoning Follow-Up and Home-Based Asthma Assessments**
  - Partnership to expand Medicaid services and private insurance to cover healthcare financing for lead poisoning follow-up and for housing-based asthma services.
  - OLHCHH is conducting local asthma summits to promote insurance reimbursements for asthma home assessments and interventions.



Cross-Cutting Initiatives (Cont.)

- **Implementation of the Federal Radon Action Plan**
  - OLHCHH is working to more explicitly include radon testing and intervention in HUD's programs.
  - OLHCHH worked to develop and implement new radon testing and mitigation requirements by the Office of Multifamily Housing
  - OLHCHH is encouraging OLHCHH grant recipients to test for and mitigate radon hazards



- **Participation on Federal and Interagency Workgroups**
  - OLHCHH chairs the Steering Committee of the Federal Action Plan to Reduce Asthma Disparities
  - OLHCHH participates in HHS' Healthy People 2020 Federal Interagency Workgroup, the Children's Environmental Health Task Force, and many other interagency groups

What's Next?

- Continue implementation of activities that will fulfill the goals outlined in the federal *Strategy for Action*
- Continue to providing funding for grant programs (research grants, and grants for producing lead-safe & healthy units)
- Continue to monitor enforcement and compliance with the Lead Safe Housing Rule, Lead Disclosure Rule, and EPA's Renovation, Repair, and Painting (RRP) Rule, which covers work in pre-1978 HUD-assisted (and unassisted) housing
- Expand the Office's Healthy Homes Grants Management System (HHGMS) to include a more robust evaluation and review of outcomes

THANK YOU!

Paul Diegelman

Paul.diegelman@hud.gov

216-357-7656

OFFICE OF
LEAD HAZARD CONTROL
AND HEALTHY HOMES
Healthy Children | Healthy Families | Healthy Communities

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

HEALTHY CHICAGO

CHICAGO DEPARTMENT OF PUBLIC HEALTH

Lead in Chicago

US EPA Lead Workshop for Communities
September 26, 2017

Cort Lohff, MD, MPH
Medical Director for Environmental Health

Lead Poisoning Prevention Program

- Conduct surveillance for childhood lead poisoning
- Provide case management services to lead-poisoned children
- Inspect homes for lead-based paint hazards
- Ensure property owner addresses any hazards
- Provide funding to help address hazards

Lead in Drinking Water

- Local response:
  - Chicago Public Schools
  - Chicago Park District
  - Chicago Dept. of Water Management
  - Chicago Dept. of Public Health

Lead-Based Paint Hazards

- Lead-based paint remains the primary source of lead exposure
- Low-income and minority communities disproportionately impacted

Lead-Based Paint Hazards

- New focus on identifying and remediating hazards before children are exposed:
  - Big data and predictive analytics
  - Visual inspections by community-based agencies

Collaborations

- Support community-based agencies:
  - Support lead abatement efforts
  - Educate the community
  - Conduct visual inspections
- Participate in strategic planning efforts:
  - Governor's Children's Cabinet
  - Lead Safe Housing Task Force
  - Proactively Addressing Substandard Housing

HEALTHY CHICAGO

CHICAGO DEPARTMENT OF PUBLIC HEALTH

@ChiPublicHealth /ChicagoPublicHealth

HealthyChicago@CityofChicago.org www.CityofChicago.org/Health

Community-Based Lead Poison Prevention

September 26, 2017

Presented by Theresa Heaton MPH, BSN

Kane County Healthy Places Coalition

&

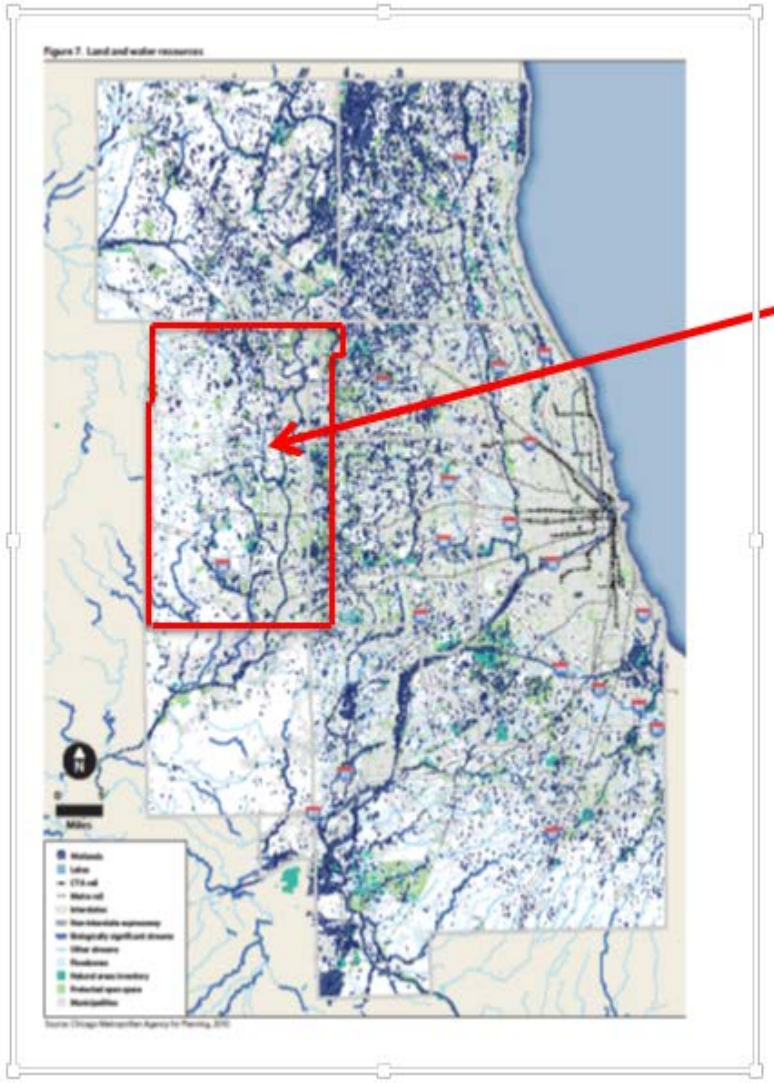
Kane County Health Department

Healthy Places Coalition of Kane County

Your Health, Our Commitment

Kane County Health Department

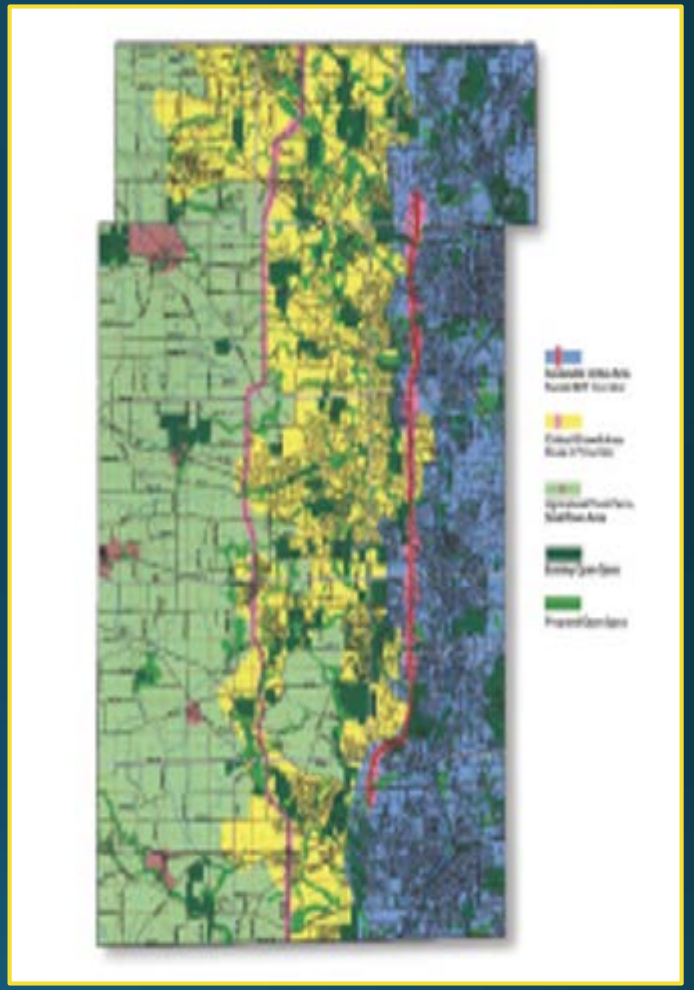
Kane County



Population of 535,521 people.

Kane includes Aurora, Elgin, and 35 other municipalities.

49% of housing is pre-1978



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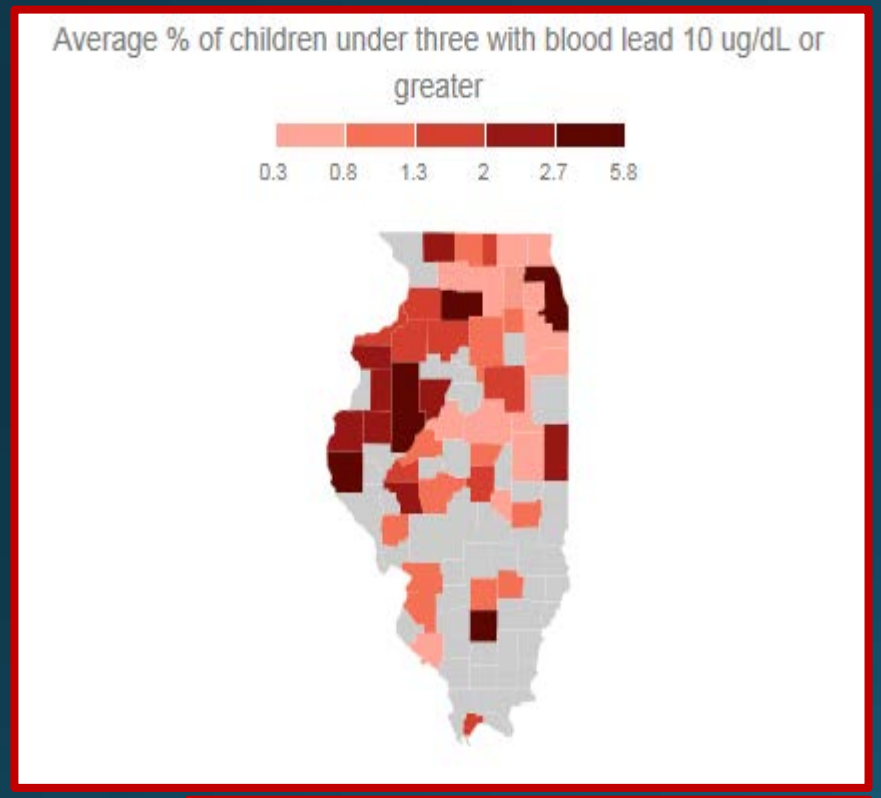
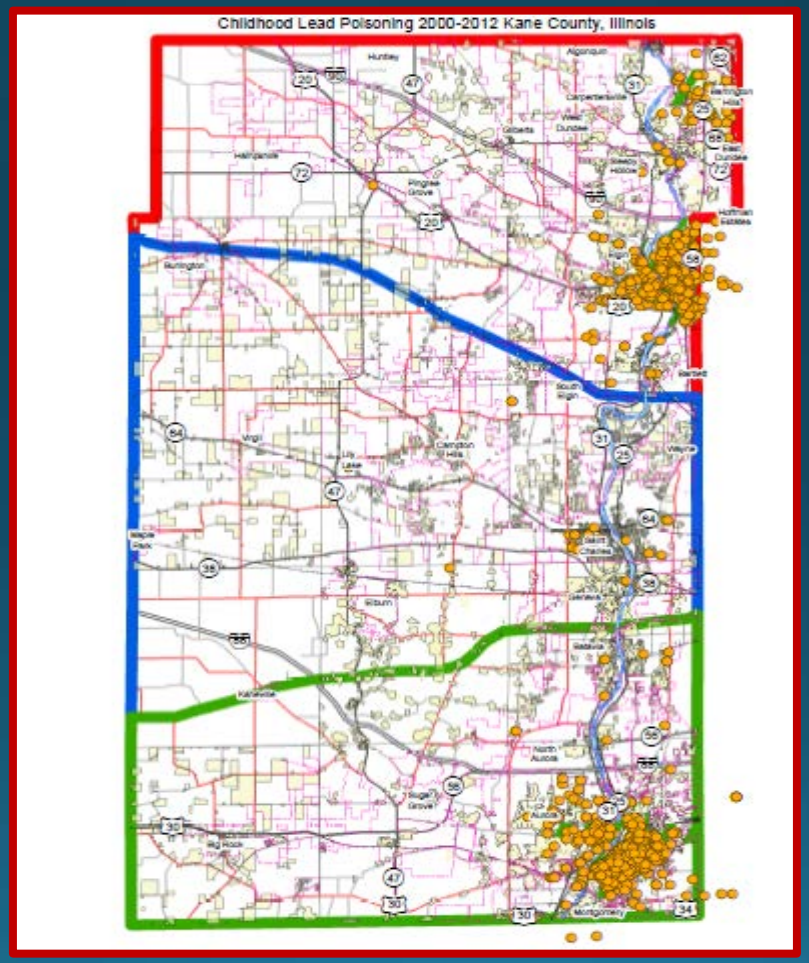
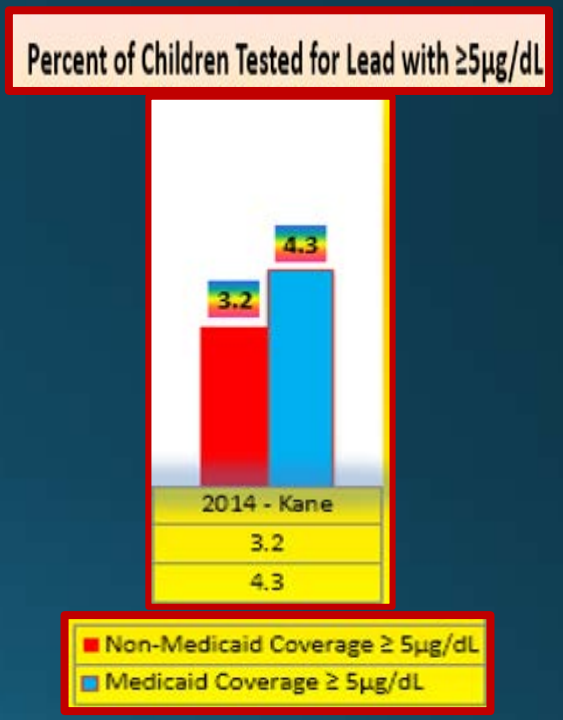
Lead in Kane County



Kane County Average (10 ug/dL or more): 1.1%

- Illinois average: 0.8%





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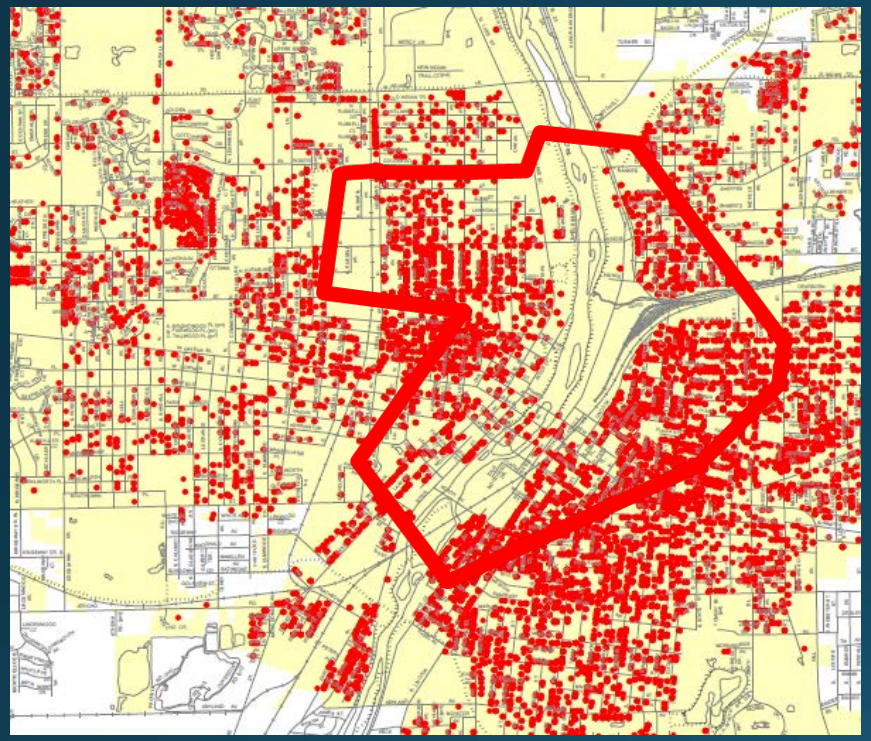
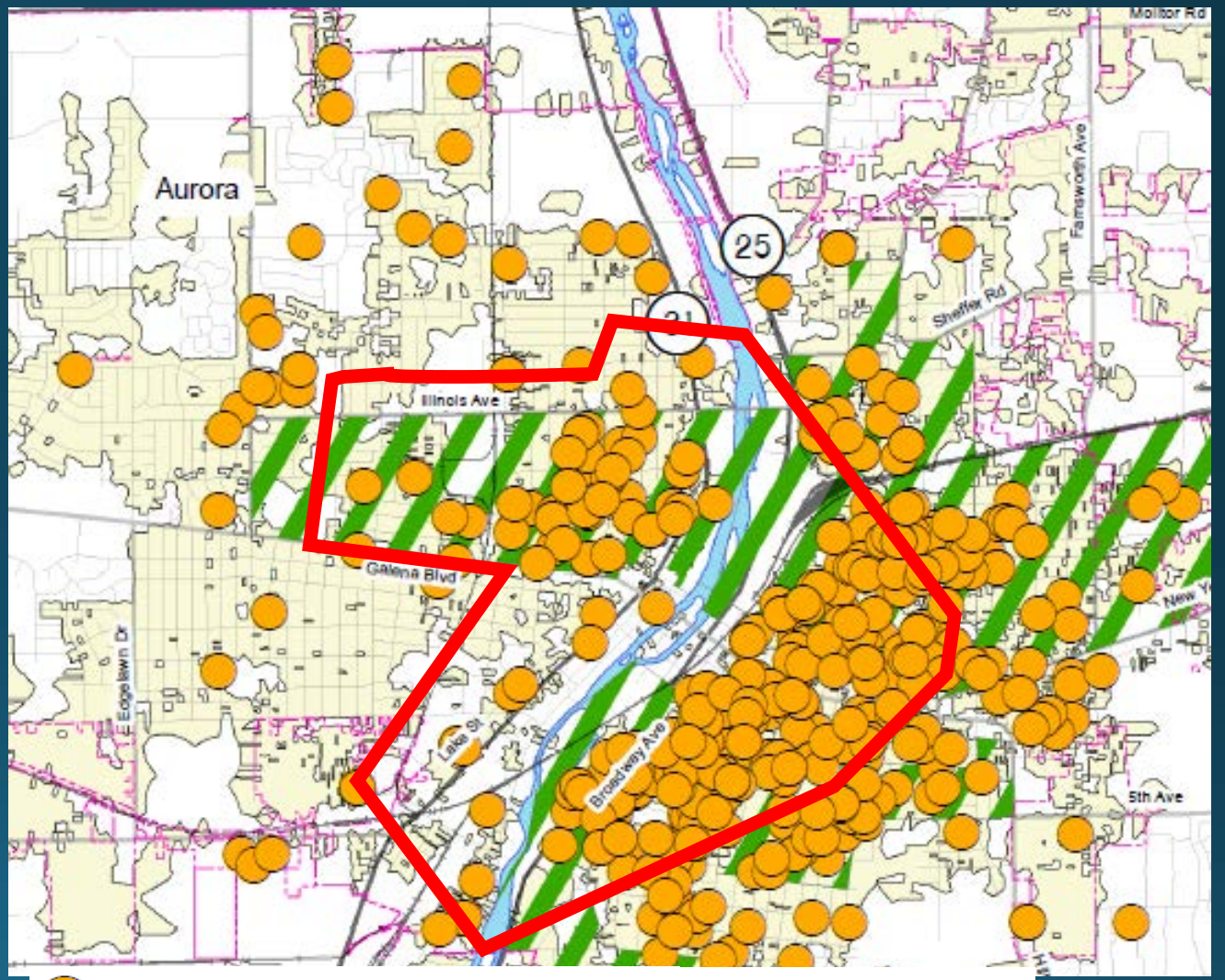
Aurora

The Gravity of our Lead paint problem





Despite knowledge of the problem and the techniques to prevent lead poisoning, our housing related lead burden is high.

Additionally a high percentage of properties in the area with the highest Lead Poisoning Concentration are Rental Properties.

Key Focus

Community Engagement
&
Collaboration

Healthy Places Coalition of Kane County

Your Health, Our Commitment

Kane County Health Department

Kane County Healthy Places Coalition (HPC)

- An essential health partnership to reach the 2030 Kane County vision: **"To have the healthiest residents in Illinois!"**

- Our **mission** is to engage all interested community members in assessing interest and issues for improving overall community health.

- **HPC partners are from diverse community sectors:** housing agencies, hospitals and health providers, fire departments, child care providers, community groups, non-profits, private corporations, home improvement stores, and governmental agencies-**since 2011!**

Kane County & US EPA Partnered on RRP Training

FREE LEAD-SAFE TRAINING FOR CONTRACTORS!

The **Kane County Healthy Places Coalition** wants to inform contractors and renovators that if you work on homes, schools or day-care centers built before 1978, you **MUST COMPLETE**
EPA Accredited Lead-Safe Training to continue working legally.

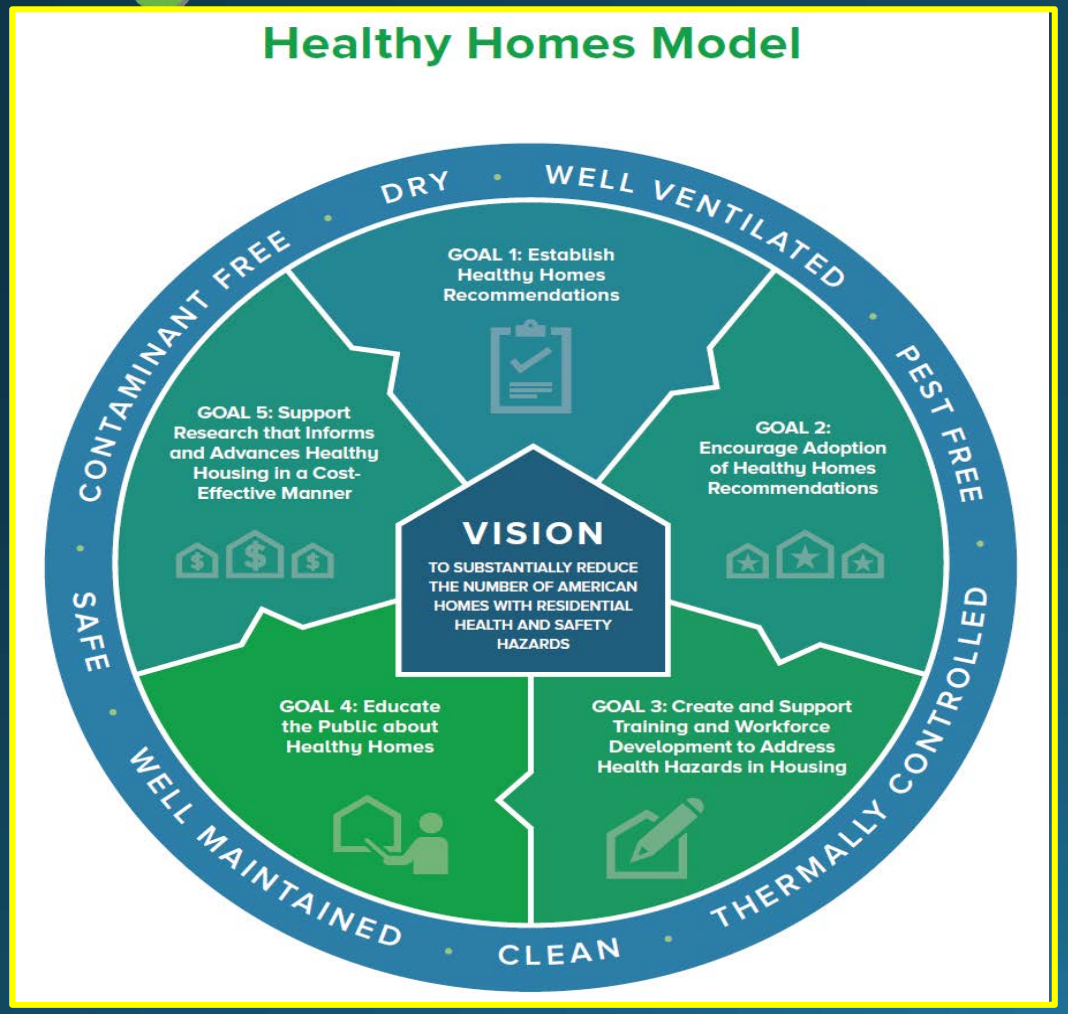
Who?

- Contractor - Renovators, Painters, Window Installers, Maintenance Staff, Electricians, HVAC Specialists, Plumbers, Floor Finishers, and more:

Healthy Places Coalition of Kane County

Your Health, Our Commitment
Kane County Health Department

Kane County Healthy Places Coalition (HPC)

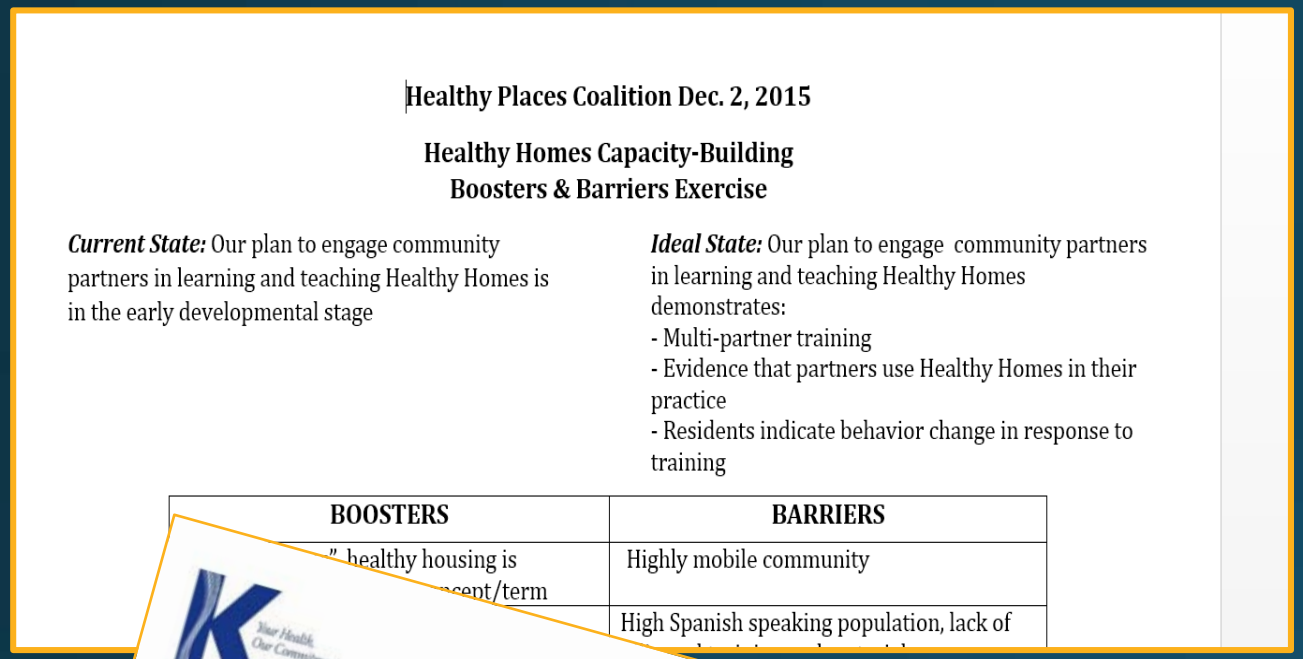


In 2015 we began to integrate our efforts using the Healthy Homes model and the 7 principles of Healthy Homes:

Keep Your Home:

- Dry, Clean, Safe
- Ventilated
- Pest-free
- Contaminant-free
- Maintained

Kane County focus on Healthy Homes Model



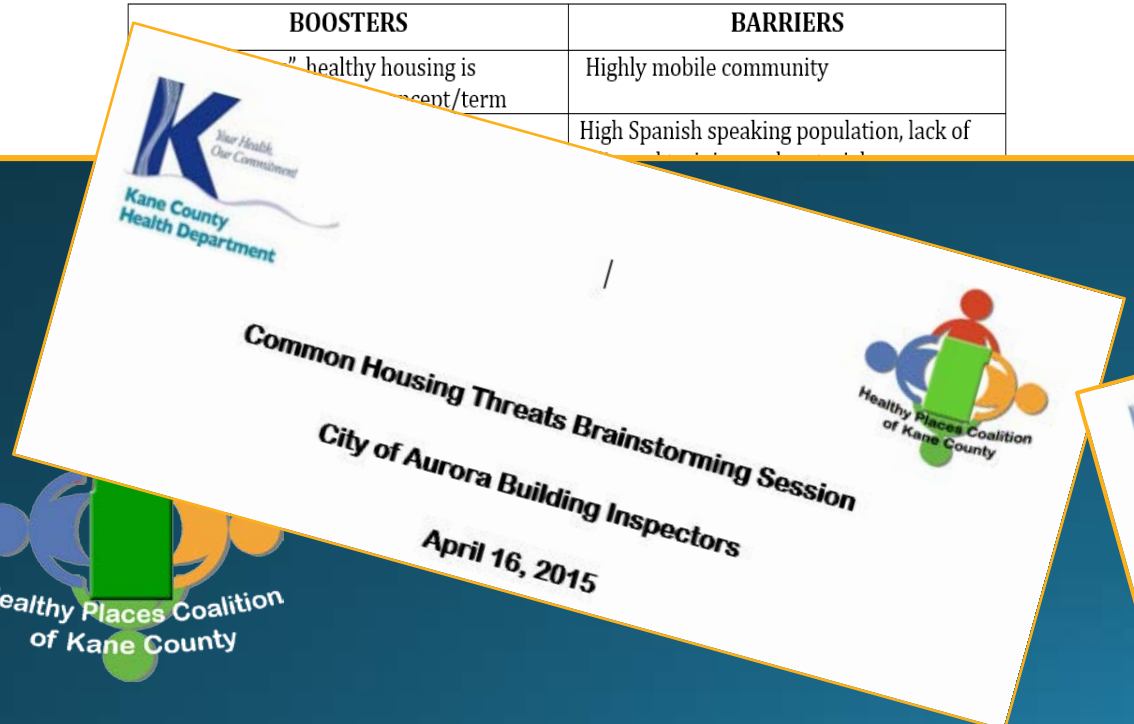
Healthy Places Coalition Dec. 2, 2015

Healthy Homes Capacity-Building
Boosters & Barriers Exercise

Current State: Our plan to engage community partners in learning and teaching Healthy Homes is in the early developmental stage

Ideal State: Our plan to engage community partners in learning and teaching Healthy Homes demonstrates:
- Multi-partner training
- Evidence that partners use Healthy Homes in their practice
- Residents indicate behavior change in response to training

BOOSTERS	BARRIERS
". healthy housing is ...cept/term	Highly mobile community
	High Spanish speaking population, lack of



Kane County Health Department

Common Housing Threats Brainstorming Session

City of Aurora Building Inspectors

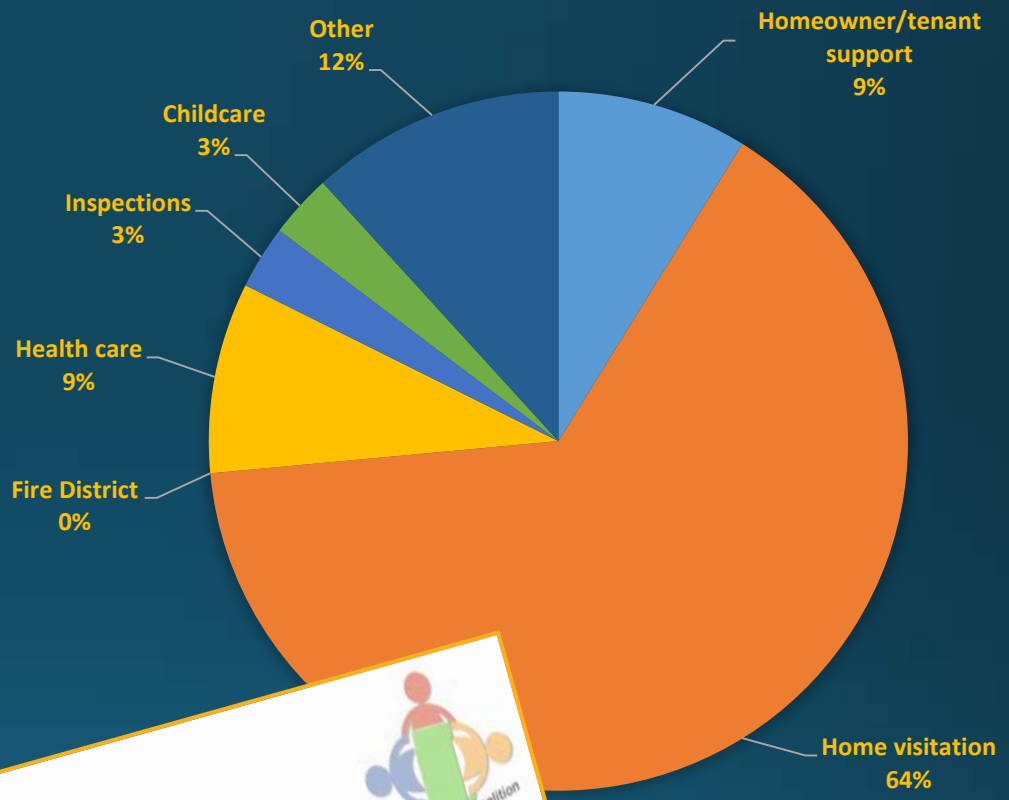
April 16, 2015

Healthy Places Coalition of Kane County

Kane County Health Department

July 29, 2015
Healthy Homes Brainstorming Session with City of Elgin inspectors

Healthy Places Coalition of Kane County



Healthy Places Coalition of Kane County

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Kane County Health Department

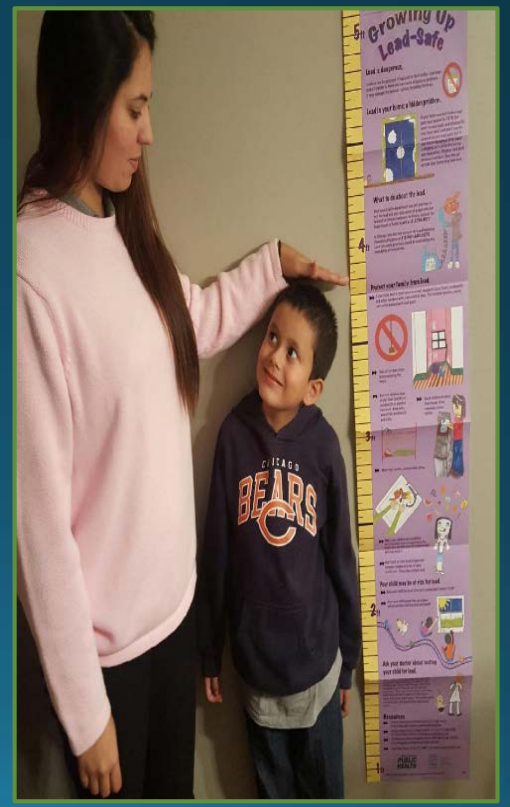
Early L earning Partners

Bookmarks & Lead Growth Charts posted

by our ELEMENTARY SCHOOLS/SCHOOL DISTRICTS 131, 300, 131, 129

- HEAD STARTS CENTERS
- SPARK
- NURSES OFFICES
- COMMUNITY CONTACTS (CCI)
- NHS of Fox Valley
- HOSPITAL: Presence Saint Joseph

OUR PARTNERS POSTED 32 LEAD "GROWTH CHARTS" in ENGLISH & SPANISH AT DIFFERENT LOCATIONS THROUGOUT KANE COUNTY



We want our Kane kids to measure up Lead-free!

Healthy Homes Tutorial Created by Aurora University Student Nurses

https://www.youtube.com/watch?v=qObXgmXSPiw

Healthy Places Coalition of Kane County

Your Health, Our Commitment

Kane County Health Department

Medical Community

Kane County Health Department — Your Health, Our Commitment

Agenda Item/ *Handouts*	Discussion/Opportunities	Recommendations/ Actions Needed
3. Brainstorm: best ways to get to our goal—how do we "dive into this pool?"	• Approach through nurses, outreach workers, child care centers • Get on agendas of local and state medical associations and in their newsletters (HPC did attend the Kane County Medical Society meeting and placed an article in their newsletter about radon in Jan 2014) • Get into the AAP, AFP, ACOG newsletters • Approach the public with awareness so that they talk to their doctors about the topics e required to read and write synopses of articles, this may be an duce environmental health articles—especially since the ACOG n Opinion on Environmental issues ….with the development of next action step. already collaborating on a project for environmental exposures: write ups of the articles leading to certification. mmittee on Environmental Health which could be an opportunity s and nurse practitioners who do more patient education rather than doctors oined group through Grand Rounds community that Edward described (methamphtimine exposure a multi-year Grand Rounds plan champions in the community s just starting their practices in Kane County onversations with nurses and keep them in mind for CEU; partner ts pportunities (PEHSU has been working to get "blanket" permission to offer RN CEU's); also nurses are key to prenatal exposure to lead, especially when a child in the home has had an elevated lead level. •	

Healthy Places Coalition of Kane County

Kane County Healthy Places Coalition

PEHSU Physician Conversation Agenda

October 21, 2014

8:00 am.

Rush-Copley Medical Center Conference Room 4 Lower Level

Goal for today's meeting: Explore the environmental health consultation and continuing education needs and interests of local Kane pediatric and obstetric providers.

October 28, 2015

American Academy of Pediatrics
Illinois Chapter

ICAAP-lets

... | Projects | Advocacy | Subscribe |

Kane County Healthy Places Coalition Declares Kane Kids Run Better Unleaded

Kane County Healthy Places Coalition

Why educate the parents of your pediatric patients who test positive for lower levels (≥ 5 µg/dL) of lead? Because **Kane Kids Run Better Unleaded!**

- There is no safe level of lead in blood.
- Even low levels of lead in blood have been shown t... and academic achievement.
- Lead poisoning affects Kane County children ... race, gender, and Medicaid/non-Medicaid cov...
- 48% of Kane County homes were built before ...
- In 2013, 5.7% of all children tested in Kane Cou...
- 42% of children who test positive for lead are bet...
- The AAP recommends that health care providers ... parents of all infants and toddlers because of norm... between the ages of 6 months and 3 years.
- Parents may not be aware that their homes, work an... hazard for their children.
- Frequent risk assessments and education is vital to kee...

For more ...ion about the Kane County Healthy Places Coa... website or ...man at RomanTerry@co.kane.il.us.

...ease visit the

Why Educate Parents of Pediatric Patients Who Test Positive For Lower Levels of Lead?

The Kane County Healthy Places Coalition

Nearly half a million children living in the U.S. have elevated blood lead levels that may cause significant damage to their health, estimates the Centers for Disease Control and Prevention (CDC). In 2012, one in every 14 Illinois children (10%) tested had a confirmed venous lead level of 5 micrograms per deciliter or greater. Major sources of lead exposure to Illinois children include lead-based paint and lead-contaminated dust in deteriorating buildings. Children can also be exposed to lead from additional sources including contaminated drinking water, take-home exposures from a workplace, and lead in soil. Despite the continued presence of lead in the environment, lead poisoning is entirely preventable. Kane County Healthy Places Coalition has:

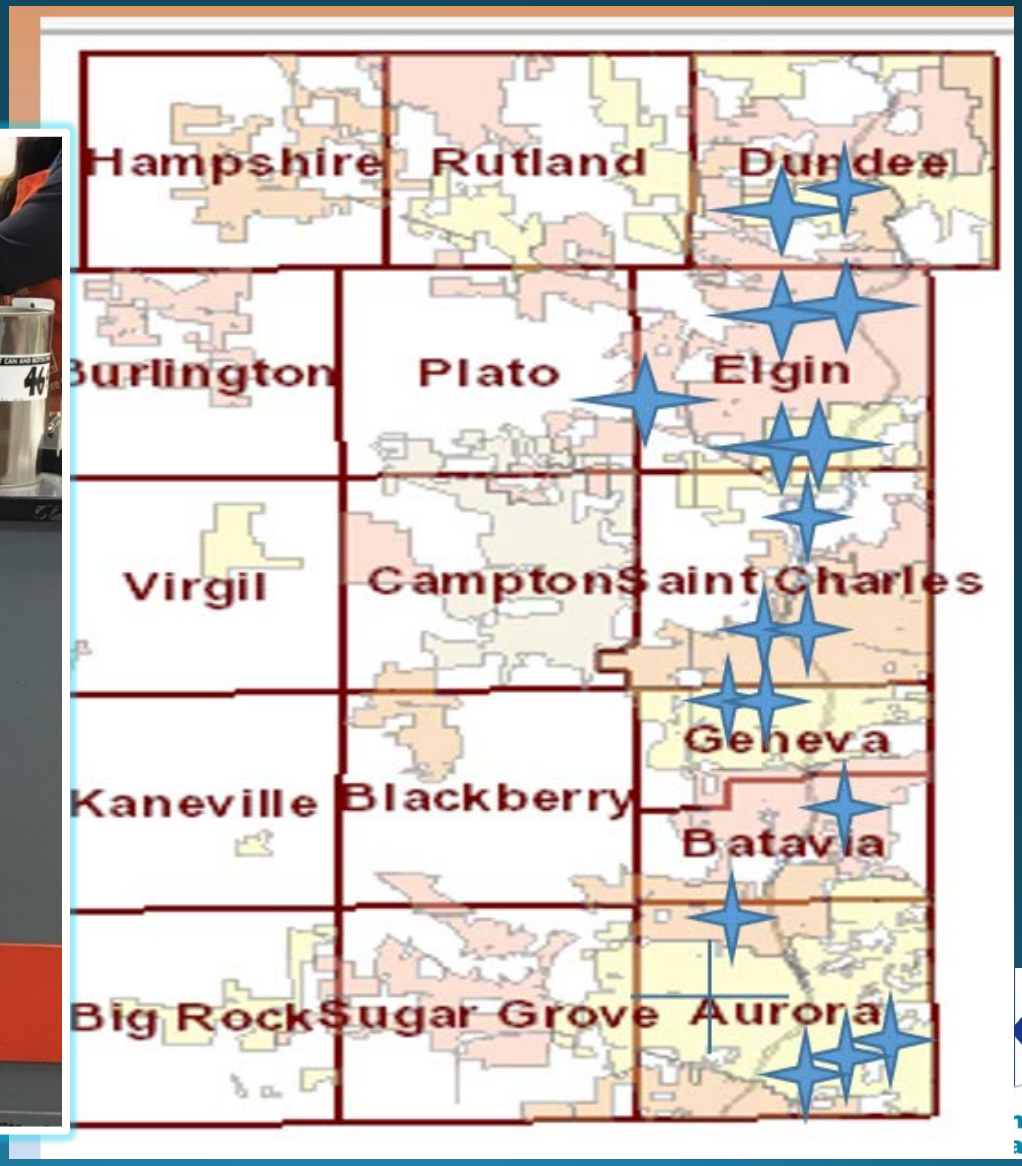
Healthy Places Coalition of Kane County

Your Health, Our Commitment

Kane County Health Department

Kane County Business Partners

Risk	Partners
Lead	15
Carbon Monoxide	13
Radon	12
Eco-Friendly Lawn Care	10



Healthy Places Coalition of Kane County

Your Health, Our Commitment

ne County
alth Department

Municipal Project to Increase RRP Awareness

Action Plan for RRP Municipal Improvements

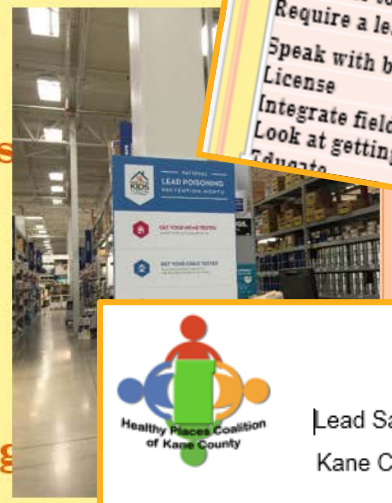
Actions Taken:

1. HPC completed our municipality survey and made recommendations on 12/2/2015.
2. Consulted with Elgin & Aurora on the recommendations.
3. Secured a slot to present at the Illinois Association of Code Enforcement.

Actions To be Taken

1. Present at the Fox Valley Association (southern Kane area) Support municipalities in making system chang
2. Seek resources to help contractors who need to be RRP certified.

Track any new RRP policy or procedures



What action can you take in the next six months to improve RRP compliance in your jurisdiction?

Educate our public and get management on board
Communication/pamphlets
Would be a joint effort to work with Permits Dept. to provide this info to contractors and resource
certification to an extent for remodeling projects. Educating contractors the public and requiring
proper certification from contractors would improve lead prevention.
Combine with permit approval process
Permit process application/building department
Had little to do with topic info, but it was fun. Need handout ideas
Require a lead paint test before work is being done
Speak with building department to see if they will incorporate into permit places
License
Integrate fields into applications and forms
Look at getting information to residents

Lead Safe Work Practices & RRP Awareness, October, 2017
Kane County Healthy Places Coalition Key Informant Survey

Permit Department: _____ Date: _____

Key Informant: _____

Interviewer: _____

1. Do you identify if work is to be done on a pre-1978 building? *If so, how? If not, could you?*

Healthy Places Coalition of Kane County

Your Health, Our Commitment
Kane County Health Department

How Can We Be Proactive?

- Make sure parents, contractors, homeowners, property owners and renters know how to protect families from lead hazards

- Educate contractors on RRP rule requirements

- Make sure contractors follow lead-safe work practices and keep job sites clean

The Gravity of our Lead paint problem

What can Illinois Muni's do?

- **Education** – Links & Pamphlets (contractors, day-care operators, homeowners, landlords, tenants)
- **Program Compliance** for CDBG, HOME, & ALL City Funded Projects
- Contractor **RRP Certification verification** www/EPA.gov
- **Mitigation Programs** - G. L. O.

Community Engagement
&
Collaboration

Lesson learned…it is a journey and it takes time to get everyone on the same road and going in the same direction….so much to learn along the way!

Healthy Places Coalition of Kane County

Your Health, Our Commitment
Kane County Health Department

Questions? Comments?

Thank you!

heatontheresa@co.kane.il.us

Lead Workshop for Communities
US EPA – Region 5
Tuesday, September 26, 2017

U.S. EPA Lead-based Paint Program

U.S. EPA Lead-based Paint Program

- Regulations under which the Lead-based Paint program operates
  - 40 CFR Part 745
    - Subpart E. Renovation, Repair and Painting Rule (“RRP” and “PRE”)
    - Subpart F. Disclosure (“1018”)
    - Subpart L. Abatement (“Activities”)

U.S. EPA Lead-based Paint Program

Work most closely with States

- All Region 5 States (IL, IN, MI, MN, OH, WI) have authorized abatement programs
- MI and WI have authorized PRE programs
- WI has an authorized RRP program
- Bois Forte Tribe has authorization for RRP, PRE, and abatement programs

U.S. EPA Lead-based Paint Program

How the program has worked with communities to reduce lead exposures:

- Coordinated, targeted inspections and enforcement actions
- Partnering with building departments
- Funding RRP Training in EJ areas (e.g., coordination)
- Work with City of Chicago and Lead Safe Illinois
- Provide technical assistance and outreach materials

U.S. EPA Lead-based Paint Program

Actions with communities that lead to increased awareness of lead *and/or* contributed to reduced lead exposures:

- Ongoing:
  - Implementation of RRP and abatement, coordinated with states
  - Coordination with local building departments
  - Resources: outreach/education

U.S. EPA Lead-based Paint Program

Informational resources, websites, contacts

- https://www.epa.gov/lead
- National lead hotline: 1-800-424-LEAD (5323)
- Regional lead number: 1-800-621-8431, ext. 6-6003
- Tony Martig, Chief, Toxics Section
  - Martig.anton@epa.gov
  - 312-353-2291

Drinking Water Overview

U.S. EPA, Region 5

September 26, 2017

Regulating Contaminants
(All Three Conditions Must be Met)

- ☑ Contaminant may have an adverse effect on the health of persons
- ☑ Contaminant is known to occur or there is a high chance that the contaminant will occur often enough at levels of concern
- ☑ Regulation presents a meaningful opportunity for health risk reduction

Setting Limits for Contaminants

- Develop Maximum Contaminant Level **Goal** (MCLG) at which there is no known or anticipated risk, with a margin of safety
- Develop an Maximum Contaminant Level (MCL) as close to the MCLG as possible, taking cost, and treatment/analytical capabilities into account
- Where it is not feasible to set an MCL, develop a 'Treatment Technique' (TT) to lower contaminant(s) as close to MCLG as possible.

Setting Limits for Contaminants

- Considerations
  - Can we reliably measure the contaminant?
  - Is there effective treatment that public water systems can use to reach regulatory limit?
  - What is the cost of regulating the contaminant at different levels?

Difference Between Max Contaminant Levels And Max Contaminant Goals

- EPA has set the MCL at the MCLG for 41 of 71 regulated contaminants
  - No known or anticipated risk, with a margin of safety
- EPA has set the MCL higher than the MCLG for 30 of 71 contaminants
  - Some risk **IF** contaminants are present but water is considered ‘safe’
- EPA uses Treatment Techniques for 4 chemical contaminants including lead, as well as all microbial contaminants.

Issues with Lead Service Lines and Drinking Water

- Typically, lead is not coming from the water source, water treatment plant, or water mains
- Lead comes from service lines and home plumbing, which means it cannot be removed at the plant like other chemicals that are found in the source water

Issues with Lead Service Lines and Drinking Water

- Available centralized treatment (at water plant) cannot achieve 100% reduction in lead
  - —*Cannot achieve zero risk*
- To achieve zero risk, must remove lead service lines and associated galvanized iron pipe and all leaded plumbing components in home

Available Tools are Limited

- **Centralized corrosion control treatment**
  - pH/Alkalinity adjustment
    - Alter water chemistry at the treatment plant to make water less corrosive
  - Corrosion inhibitors
    - Add corrosion inhibitor at the treatment plant to coat pipes with orthophosphate or silicate

Available Tools are Limited

- **Certified Point-of-use water filters**
  - Very effective at lead removal
- **Removal of lead-bearing plumbing**
  - Lead service lines and associated galvanized iron pipe, leaded brass, leaded solder

Basis for POU Filter Recommendation

- **Corrosion control treatment can significantly reduce lead levels, but…**
  - Significant variability from home to home
  - Available centralized treatment (at water plant) cannot achieve 100% reduction in lead
  - Physical disturbances to LSLs can cause elevated, variable lead even when treatment is effectively managed

How to Eliminate Lead Exposure

- **Permanent Solution:** Replacement of any lead service line connected to the home as well as any other lead-containing pipes or plumbing fixtures associated with the home.
  - Cost for removing lead service line can be $3,000 to $10,000, but may increase home value
  - Cost for removing internal lead sources will vary

How to Eliminate Lead Exposure

- Temporary Solution: **Until lead service lines** and other lead-containing components are removed, the next best approach is for a homeowner to properly install, use and maintain a certified lead filter at the tap, which can remove up to 99% of lead from a home's tap water
  - Cost is approximately $8 per month

SUPERFUND COMMUNITY LEAD APPROACHES

Joe Dufficy—Land Revitalization Branch

September 2017

SUPERFUND AND LEAD RESPONSE

The Superfund Program has 4 main activity areas—all deal with lead.

1. Remedial or long-term response/cleanup—large abandoned wastes sites. Approximately 360 in Region with an annual budget of 150M.
2. Removal/Emergency Response—spills, accidents and environmental emergencies. Approximately 50-60 new responses per year with an annual budget of 20M
3. Brownfields/Land Revitalization—land and property reuse. We are working with approximately 100 communities at any one time with annual budget of 20 to 25M.
4. Community Involvement and Outreach—covers all areas. Direct community contact.

We will briefly cover 5 examples: Pilsen Soils, Chicago, Cleveland Smelter Investigation and Cleveland Background Soils Investigation, Urban Agriculture Guidelines and Residential Demolition

SUPERFUND AND LEAD RESPONSE

Pilsen Soils Investigation and Cleanup → *https://www.epa.gov/il/pilsen-area-soil-site*

Project started with a meeting request from PERRO and LVEJO in 2011 seeking assistance in determining potential environmental impacts from the Fisk and Crawford Power Stations.

But expanded over the course of sampling and frequent meetings to it's current form: a Removal Action addressing nearly 180 residential properties and at least 5 industrial sites.

The average soil concentration is 1400ppm.

SUPERFUND AND LEAD RESPONSE

EPA conducted over 80 community outreach activities in the first 12-18 months of this effort.

find out if a cleanup is needed. Turning in your signed access a access a *box, left*) during January and February will help the Agency be gency be the first signs of spring arrive.

Agreement reached

In December, EPA finalized a legal document that requires H. quires H. to sample soil lead levels in the 25-acre area of the Pilsen neigl sen neigl will oversee the sampling process. There are about 178 residen 8 residen within the boundary area. About 121 of these properties have yes have y soil, grass or gravel and are eligible for sampling.

Sampling process

Here is a general outline of the steps EPA follows when samplien sampli

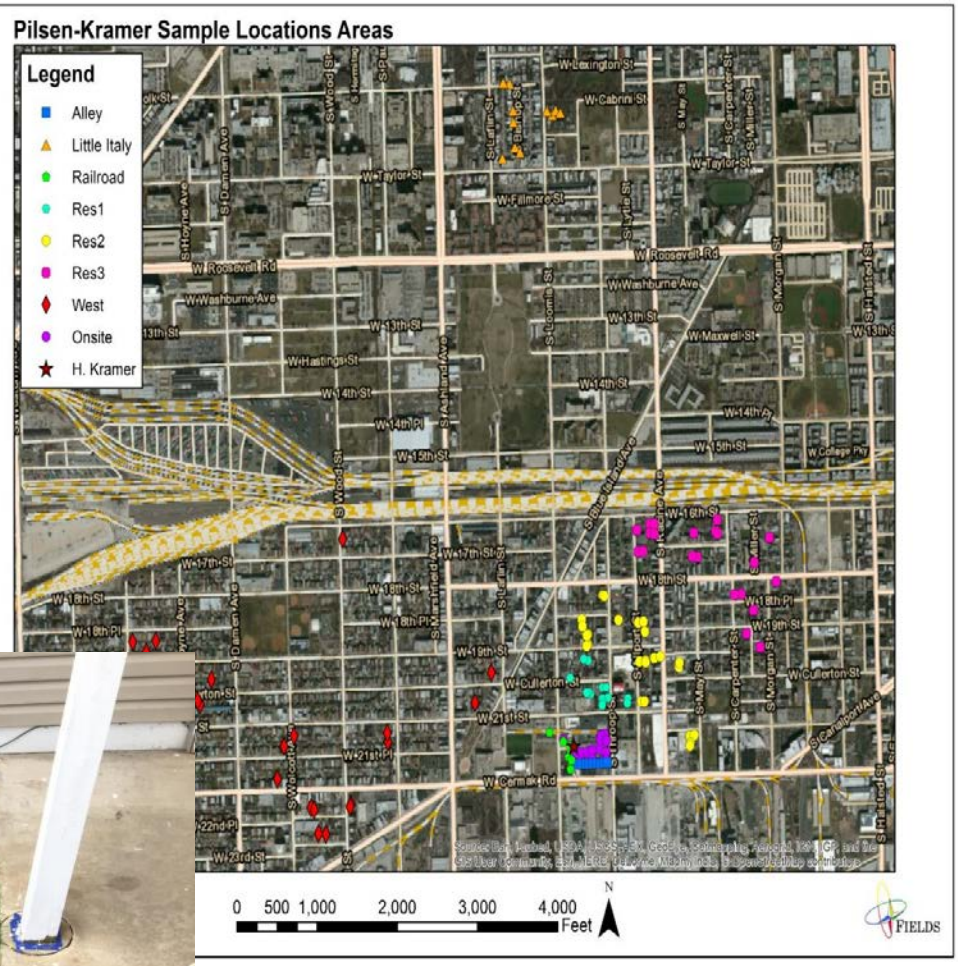
- Get a signed access agreement from the property owner. wner.
- Have public meetings to explain the project to everyone in tryone in t
- Develop a sampling schedule for the work in the neighborheighborh
- Contact the owner to set the time and date of the work. ork.
- Collect soil samples, inventory the landscape and get informget inform physical features and conditions of the property.
- Send samples to a laboratory for analysis.
- Communicate with the owner after EPA receives the laboratahe laborat

About the Pilsen Area Soils site

EPA has been investigating lead contamination in C neighborhood since 2011, when it became involved former Loewenthal Smelter. Residents requested ad the area's long i

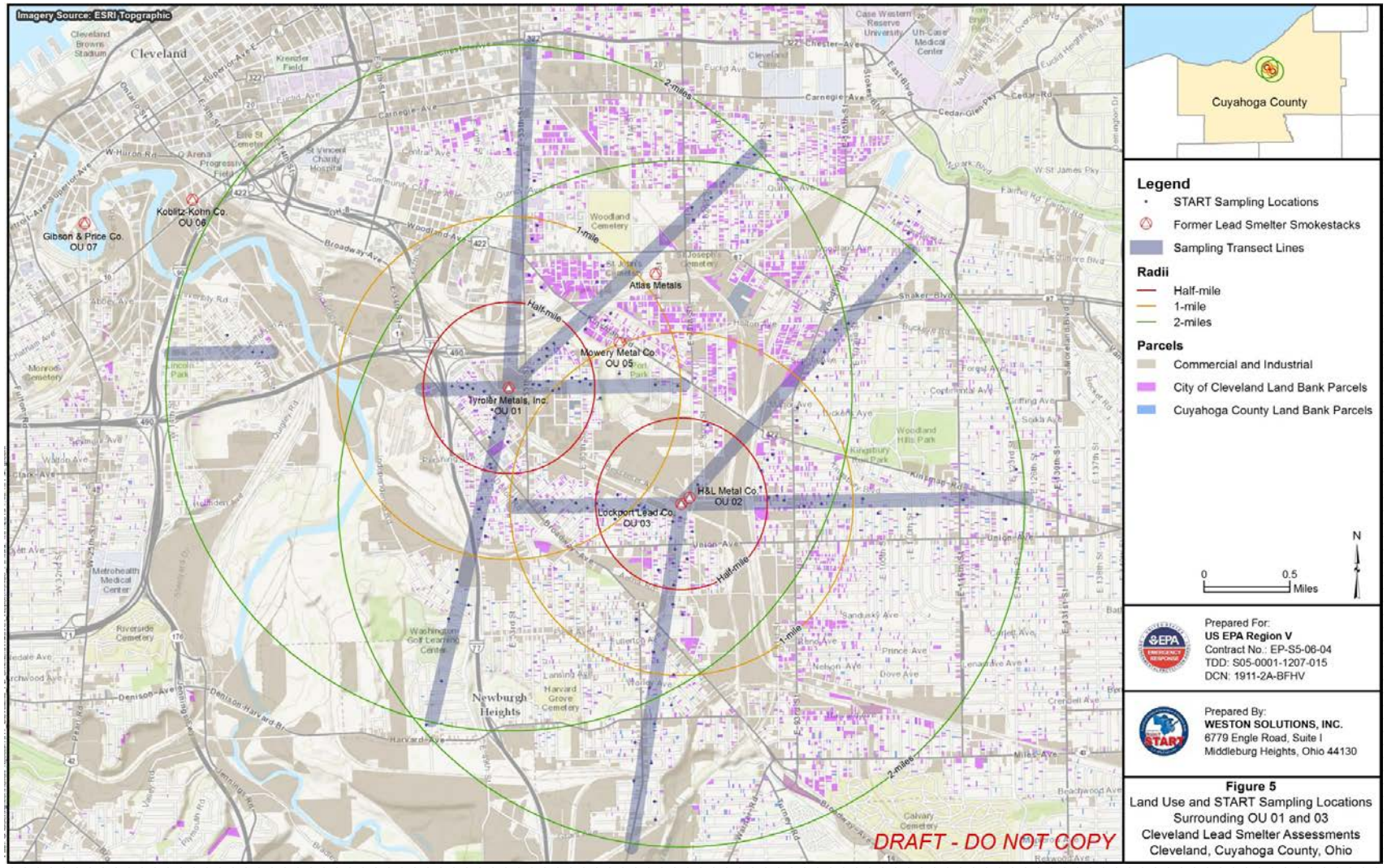
12 and 2013 and l areas, as well cility. Starting in a railway spur nd the excavati spur and alley b h asphalt or gra

As of 9/1/17, over 600,000 pounds of lead contaminated soil has been removed from 31 homes by the responsible party.



Getting to this point took substantial time and analysis. because we can not respond just to "lead."

SUPERFUND AND LEAD RESPONSE: CLEVELAND FORMER SMELTER INVESTIGATION



Question: can any environmental lead found be tied to a known industrial process and specific source?

Assessment strategy:

- Modeling of atmospheric deposition
- Upwind, downwind, and crosswind sampling transects
- Soil samples spaced at intervals along each transect
- Lead speciation analysis by the University of Colorado

Collection of Representative Composite Soil Samples

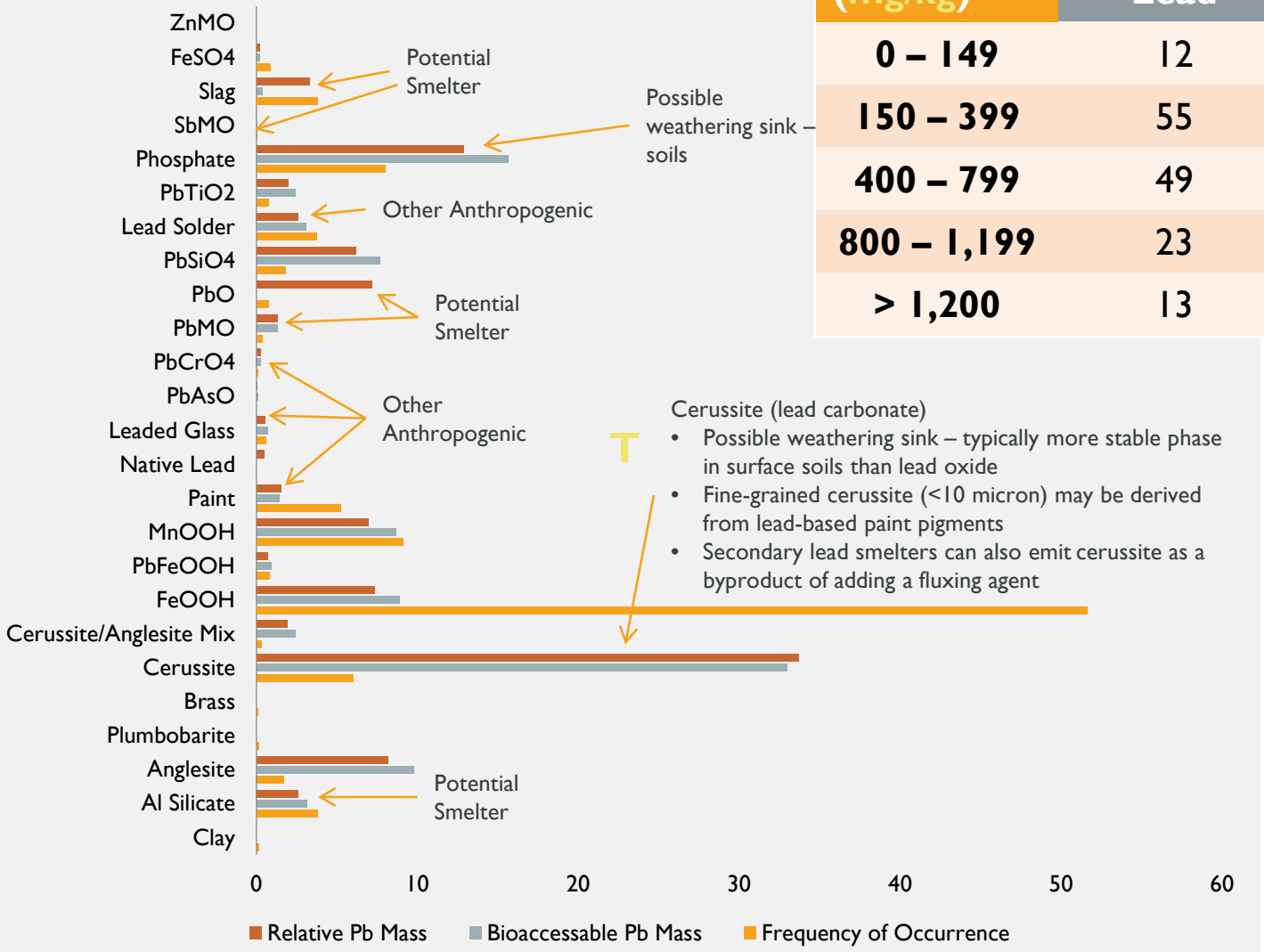
152 sampling locations selected including vacant land bank parcels

- City of Cleveland Land Bank
- Cuyahoga County Land Bank

- Targeted former back yards
- Avoided former building foundations and areas with disturbed surface soil

Speciation Results

Summary Site Soils



Cerussite (lead carbonate)

- Possible weathering sink – typically more stable phase in surface soils than lead oxide
- Fine-grained cerussite (<10 micron) may be derived from lead-based paint pigments
- Secondary lead smelters can also emit cerussite as a byproduct of adding a fluxing agent

Lead Ranges (mg/kg)	Number of Parcels: Fine-Grained Lead	Number of Parcels: Coarse-Grained Lead	Number of Parcels: Total Lead
0 – 149	12	21	21
150 – 399	55	60	58
400 – 799	49	54	52
800 – 1,199	23	9	14
> 1,200	13	8	7

Land Revitalization Community Lead Approaches

EPA United States Environmental Protection Agency

On the Road to Reuse:
Residential Demolition Bid Specification Development Tool

Report # 560K13002 September 2013

Communities Can Use this Tool for Planning and Procurement

This report identifies the environmentally sensitive activities associated with demolishing residenc pre-planning to demolition to site rehabilitation (e.g., hazardous materials abatement, fill selection and placement, material recycling or deconstruction). For each of the activities, th provides decision-making information and bid specification language suggestions to ass government officials in updating their bid specification documents. The report is not intended stand-alone bid specification. Local users should identify areas of improvement and then select to be inserted into their existing procurement document. Local procurement laws and practi conditions, materials markets, climate and even local vegetation needs can impact how a spec can be adapted for local use.

Note: This Residential Demolition Bid Specification Development Tool does not create a regulatory requirements or change any existing regulatory requirements. The document includes regulatory requirements along with best practices to consider while developing demoli specifications and contracts.

Future Application in Conjunction with Federal Partners

Demolition Practices Set Stage for Floodplain and Stormwater Management

The Milwaukee Metropolitan Sewer District is demolishing 83 homes along the Kinnickinnic River as part of a $50 million infrastructure project on floodplain and stormwater management. Improved demolition practices will avoid costs later in the project to widen the stream channel and eliminate flooding of adjacent neighborhoods. MMSD demolition contractors use improved fill materials to allow stormwater infiltration and are actually *deconstructing* the buildings in the floodplain. The demolition bid specifications identify the allowable soil materials as well as the percent, by weight, of the house demolition materials that should be kept out of landfills.

The HUD Neighborh Stabilization Program and 'Hardest Hit' program are sources of demolition f Region 5. This report high technical features in the d process that allows exp stabilization to occur thro site preparation for event

FEMA may utilize the re demolition bid specifica facilitate disaster mitiga recovery. FEMA and EP explore how demolition can enhance both storr infiltration and reduce flo illustrated by the MMSD

Contacts:

Jon Grosshans, Community Planner
Superfund – Community & Land Revitalization
U.S. EPA Region 5
77 W. Jackson Blvd., SM-7J
Chicago, IL 60604
312-353-5617
Grosshans.jon@epa.gov

Brooke Furio, Section Chief
Office of Enforcement and Compliance Assurance
Strong Cities Strong Communities, Community Solution Team
U.S. EPA Region 5
25089 Center Ridge Road, ME-W
Westlake, OH 44145
440-250-1705
Furio.brooke@epa.gov

Hazardous Materials Handling
MANAGING HARMFUL DUST

PURPOSE

This specification has been developed under a project funded by the United States Environmental Protection Agency (EPA) to provide additional guidance for residential demolitions. The goal of the Managing Harmful Dust specification is to provide requirements for the Contractor to prevent worker exposure to harmful fugitive dusts that may be generated during demolition activities. Specific hazards in this section include:

- Lead based paint (LBP)
- Polychlorinated biphenyls (PCBs)
- Other sources of hazardous dusts

REFERENCES

A. State Specific Residential Cleanup Criteria
B. State Specific Licensure Requirements for Lead
C. 29 CFR 1910 Subpart Z: OSHA General Industry Standards for Toxic and Hazardous Substances
D. 29 CFR 1926.62 – OSHA Construction Safety and Health Regulations for Lead
E. 40 CFR Part 761 – EPA Regulations for PCBs

CONTRACTOR REQUIRED SUBMITTALS

A. The Contractor shall include in the Work Plan a section detailing the planned procedures, controls, and methods to handle potential harmful dust. The inspection report, as discussed in the "Pre-Demolition Survey" specification, shall be used by the Contractor to develop procedures, controls, and methods for mitigating hazards associated with LBP and PCBs.

QUALITY ASSURANCE

A. All lead-related work must be performed by personnel with sufficient experience in conducting lead-related work in residences. When required by federal or state regulations, all lead-related activities must be completed by appropriately licensed or certified lead professionals and/or firms.

All lead removal and abatement work must be conducted in accordance with 40 CFR 1926.62 (OSHA Lead Standard), in addition to any state-specific regulations.

B. The Contractor shall confirm that all LBP or PCB removal operations and abatements have been completed prior to proceeding with demolition activities. If LBP in good condition remains on structure substrates, the Contractor must ensure that the demolition methods do not create hazardous dust in violation of this specification.

https://www.epa.gov/sites/production/files/2013-09/documents/road-to-reuse-residential-demolition-bid-specification-201309.pdf

Land Revitalization Community Lead Approaches

EPA

BROWNFIELDS AND URBAN AGRICULTURE:

Interim Guidelines for Safe Gardening Practices

Summer 2011

https://www.epa.gov/sites/production/files/2015-09/documents/bf_urban_ag.pdf

ine Whether Previous use is High or Low Risk to Site Soil and Water

s the site history suggest about the likelihood of contamination and potential site risks to food on?

acant parcels are alike. However, we can infer possible types of contamination based on the previous e property. For example, residential areas may have unsafe concentrations of lead where the presence housing stock or structures indicates lead-based paint was present. Polycyclic aromatic hydrocarbons a group of chemicals formed during the incomplete burning of coal, oil, gas, wood, garbage, or other ubstances, can be found at former residential properties as well as commercial and industrial properties or combustion processes. PAHs stick to soil particles and are found in coal tar, crude oil roofing tar, wood ehicle exhaust, and asphalt roads. Sites previously used for parking may have high concentrations of from leaking oils and fuel, and gas stations may have had leaking underground storage tanks that can ntaminated groundwater and soils, or poor indoor air quality. Even greenspace or agricultural uses may spots from over-fertilized ground, pesticides, or animal feed spills. The table below presents some example ants of concern found on brownfield sites.

se	Common Contaminants
ture, green space	Nitrate, pesticides/herbicides
sh, parking lots, road and maintenance vehicle services	Metals, PAHs, petroleum products, sodium, solvents, surfactants
aning	Solvents
commercial or industrial building res	Asbestos, petroleum products, lead paint, PCB caulks, solvents
rds	Metals, petroleum products, solvents, sulfate
e shops and metal works	Metals, petroleum products, solvents, surfactants
ntial areas, buildings with lead-based paint, coal, oil, gas or garbage was burned	Metals, including lead, PAHs, petroleum products creosote
vater drains and retention basins	Metals, pathogens, pesticides/herbicides, petroleum products, sodium, solvents
ground and aboveground storage tanks	Pesticides/herbicides, petroleum products, solvents
preserving	Metals, petroleum products, phenols, solvents, sulfate
al manufacture, clandestine dumping, ous material storage and transfer, industrial s and pits, railroad tracks and yards, h labs	Fluoride, metals, nitrate, pathogens, petroleum products, phenols, radioactivity, sodium, solvents, sulfate

(Adapted from Boulding and Ginn, 2004)

Each of the above constituents may be present at levels that pose no risk or, if present in high concentrations, may be harmful to those doing the initial site preparation, to the gardener, or to the quality of the plants that you are hoping to grow.

Once you feel you have an understanding of the previous uses of the site, determine whether that use is high or low risk for agriculture reuses, the likely crops or garden design, and sample the site accordingly. As a rule

of thumb, recreational or residential previous uses are typically lower risk while commercial and industrial uses can be considered higher risk, although you may find information in your research that suggests otherwise for your particular site. Consult with your state environmental agency, local health department, or county's USDA Cooperative Extension office to determine what kinds of samples you should take to accurately represent the conditions at your site.

Finding your ag extension

The USDA National Institute of Food and Agriculture funds the Cooperative Extension System – a nationwide educational network staffed by experts in agriculture working to identify and address current issues and problems. Extension offices are located in each US state and territory at its land-grant university, as well as in local and regional networks often in each county. Find your local Extension office at: *http://www.csrees.usda.gov/Extension*.

2. Perform Sampling

What additional information is needed to determine soil quality? What additional information is needed to identify or rule out potential contamination risks?

Two types of soil quality sampling are recommended for every site: soil as a growing medium, and soil contaminant concentrations for safety. Because each parcel of land is unique, each sampling approach should be considered individually. However, given that not all previous uses are created equal, we can make some assumptions about the relative risk of the previous use, and this will guide our sampling strategy. Low risk previous uses like residential areas, green space, traffic corridors and parking areas generally have a narrow band of likely contamination that allows for a basic sampling strategy. High risk uses, like manufacturing or railyards, open up the possibility of many types of contamination over a wide area of the site, and requires a more rigorous sampling strategy. Some organizations can provide technical assistance for soil testing, including the EPA and state brownfields programs, and USDA Natural Resources Conservation Service (EPA 2009).

Sampling methodology

How do you decide where to sample and how deep to go? Sampling methodologies will vary slightly depending on what you are sampling for or the type of crop you are planning to grow because some plant root systems are deeper and more extensive than others. Refer to the University of Louisville's *Urban Agriculture and Soil Contamination: An Introduction to Urban Gardening* and Purdue University's factsheet entitled, *Collecting Soil Samples for Testing* for more information on sampling frequency, collection, location, and the best time to take your samples. Don't forget to call ahead of time to have utilities marked before digging anywhere on your site. Find your local "Call before you dig" service at *http://www.call811.com*.

Low risk uses – basic sampling

Sampling for soil quality should include a composite sample that represents the on-site soil structure and composition and reflects the preferred growing area. This type of sampling and analysis is simple to perform and relatively inexpensive to do. Sampling for pH, organic matter, nutrients (nitrogen, phosphorus, potassium), soil composition (sandy, clayey, etc) and texture will determine what types of improvements should be made or amendments added so that plants can thrive in your garden.

BACKGROUND SOIL DETERMINATION SUMMARY
FOR
THREE LOCATIONS IN CUYAHOGA COUNTY, OHIO

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region V
77 W. Jackson Boulevard
Chicago, IL 60604

AND

OHIO ENVIRONMENTAL PROTECTION AGENCY
Division of Environmental Response and Revitalization
2110 E. Aurora Road
Twinsburg, OH 44087

Prepared by:

WESTON SOLUTIONS, INC.
Region V Superfund Technical Assessment and Response Team

Table 2

Breckville-Cleveland Metroparks Site Background Upper Limits for Metals

2011 Sampling

Constituent*	Background Upper Limits (mg/kg)		
	0 to 2 ft. bgs	2 to 4 ft. bgs	0 to 4 ft. bgs
Aluminum	16,831	14,259	15,858
Arsenic	14.51	15.22	14.93
Barium	61.18	101.02	84.94
Beryllium	0.67	0.91	0.86
Calcium	1,108	8515**	1,458
Chromium	22.11	20.06	21.13
Cobalt	10.68	14.39	14.51
Copper	25.61**	26.86	26.36
Iron	35,934	35,903	35,796
Lead	18.99**	14.63	19.32**
Magnesium	3,710	6,318	4,711
Manganese	465.36	409.18	446.54
Nickel	29.4**	35.6**	35.28**
Potassium	1,533	2530**	2035**
Vanadium	30.54	26.55	28.77
Zinc	73.51	81.46	77.73

Lead (Pb) in Air

Sarah Arra

Lead Workshop for Communities

September 26, 2017

Lead monitors and nonattainment area in Region 5

Conemaugh lead monitor in St. Clair Township, PA

Pilsen monitor and H. Kramer

- **For questions or more information, contact:**
  - Air regulations for lead- arra.sarah@epa.gov
  - Lead monitoring- coughlin.justin@epa.gov
  - R5 Enforcement Tip Line- (312) 886-5870
  - https://www.epa.gov/lead-air-pollution

Perspectives from the Children's Health Program

Maryann Suero, PhD
Environmental Health Scientist
Children's Health Program Manager
US Environmental Protection Agency, Region 5

Our Authority - Executive Order 13045 (1997)

- **Requires all federal agencies to:**
  - assign high priority to addressing H/S risks to children
  - coordinate research priorities on CH
  - ensure that standards take into account special risks to children

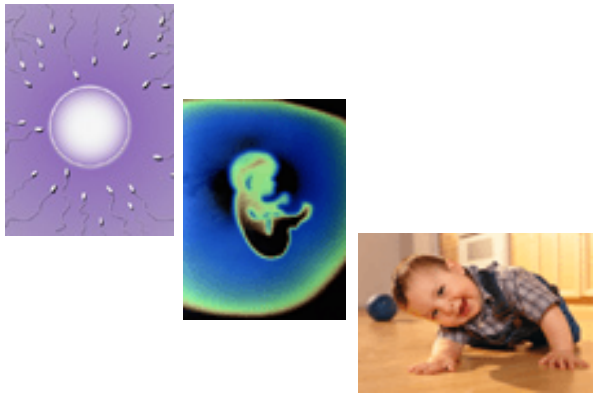
- **Created President's Task Force on Environmental Health Risks and Safety Risks to Children**
  - 17 Federal agencies
  - Past focus on lead (2002), asthma disparities (2012), healthy housing (2013)
  - Currently working on updating Fed Lead Strategy

Task Force Identified Lead as a Re-emerging Priority

2016: *Key Federal Programs to Reduce Childhood Lead Exposures and Eliminate Associated Health Impacts*

https://go.usa.gov/xRupc

Children Are Not Little Adults



Rapid Growth and Development

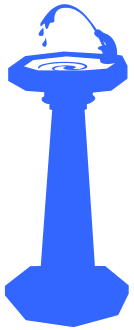
Differences in How Their Bodies Work

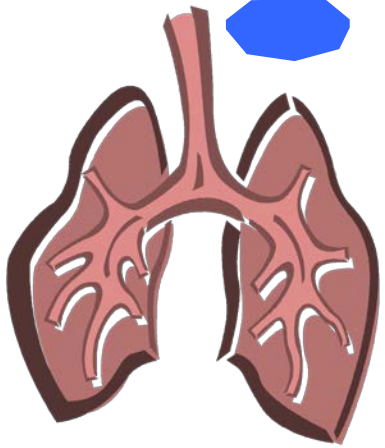
Differences in the Ways They Act

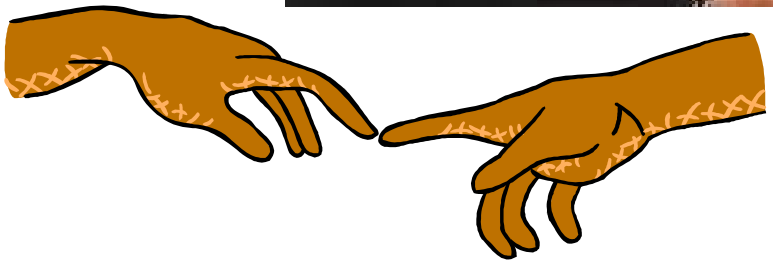
Children's Increased Vulnerability

A Child's Environment Is All Around Them

- Eating
- Drinking
- Breathing
- Touching







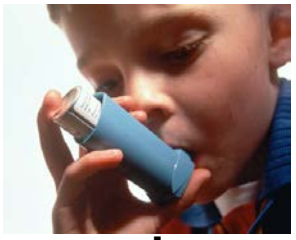
Children Spend About 90% of their time INDOORS

61%-76% **12%-33%** **6%-12%**

Structural Damage

Moisture

Mold



Asthma and Allergy Exacerbation

Adapted from CDC

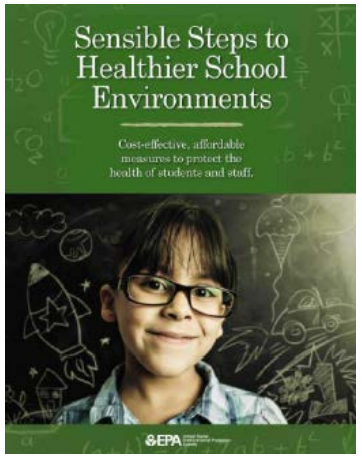
How Children's Health Program Works with Communities

- Identifying GREAT Local Champions
- Building capacity of Service Providers for healthy homes, learning environments
  - Technical Assistance, Tech Transfer
  - Train -the-Trainer Training
- Occasionally, Convener of "Stature"
- NO ONE SIZE FITS ALL
  - West Michigan / Grand Rapids
  - Fort Wayne, Allen County, IN
  - Kane County (IL)
  - Genesee County (MI) – in progress

Resources for Children's Environmental Health, Healthy Homes and Healthy Learning Environments

For more information, please contact:

Maryann Suero, PhD
Environmental Health Scientist
Children's Health Program Manager
(312) 886-9077
suero.maryann@epa.gov



http://go.usa.gov/v93Y

Holistic EPA CEH Resources

More information about many topics…

- **EPA Children's Health Website www.epa.gov/children**
- **EPA School Website , www.epa.gov/schools**
- **EPA On-Line Resources for Healthy Child Care www.epa.gov/childcare/**

Single Issue Resources

- **Lead www.epa.gov/lead**
- **Pesticides www.epa.gov/pesticides**
- **Radon www.epa.gov/radon**
- **Mercury www.epa.gov/mercury**
- **Asthma www.epa.gov/asthma**
- **Indoor Air Quality ww.epa.gov/iaq**
- **Mold www.epa.gov/mold**

Great Lakes Center for Children's Environmental Health

866-967-7337, 312-864-5526

Co-funded by EPA and ATSDR

Serves as a Regional resource, usually at no charge, to:

- **evaluate, treat and prevent environmental illness in children; consultation & referral**
- **train pediatricians and others in environmental health issues**
- **promote children's environmental health in communities**

More information at www.pehsu.net

http://www2.epa.gov/children/healthy-home-action-brochure-english

https://www.epa.gov/children/healthy-home-action-brochure-spanish

Please feel free to contact us for more information, or to suggest ways we may be able to partner in activities that will have a positive impact on children's health

Maryann Suero, PhD
Environmental Health Scientist
Children's Health Program Manager
US Environmental Protection Agency, Region 5
suero.maryann@epa.gov
312-886-9077

A NATIONAL CONVERSATION ON LEAD

David E. Jacobs, PhD, CIH

Chief Scientist, National Center for Healthy Housing
Adjunct Associate Professor, University of Illinois at Chicago School of Public Health
Director, Collaborating Center for Healthy Housing Research and Training (US) for the World Health Organization

Lead Workshop For Communities
EPA Region 5, Chicago IL
Sept 2017

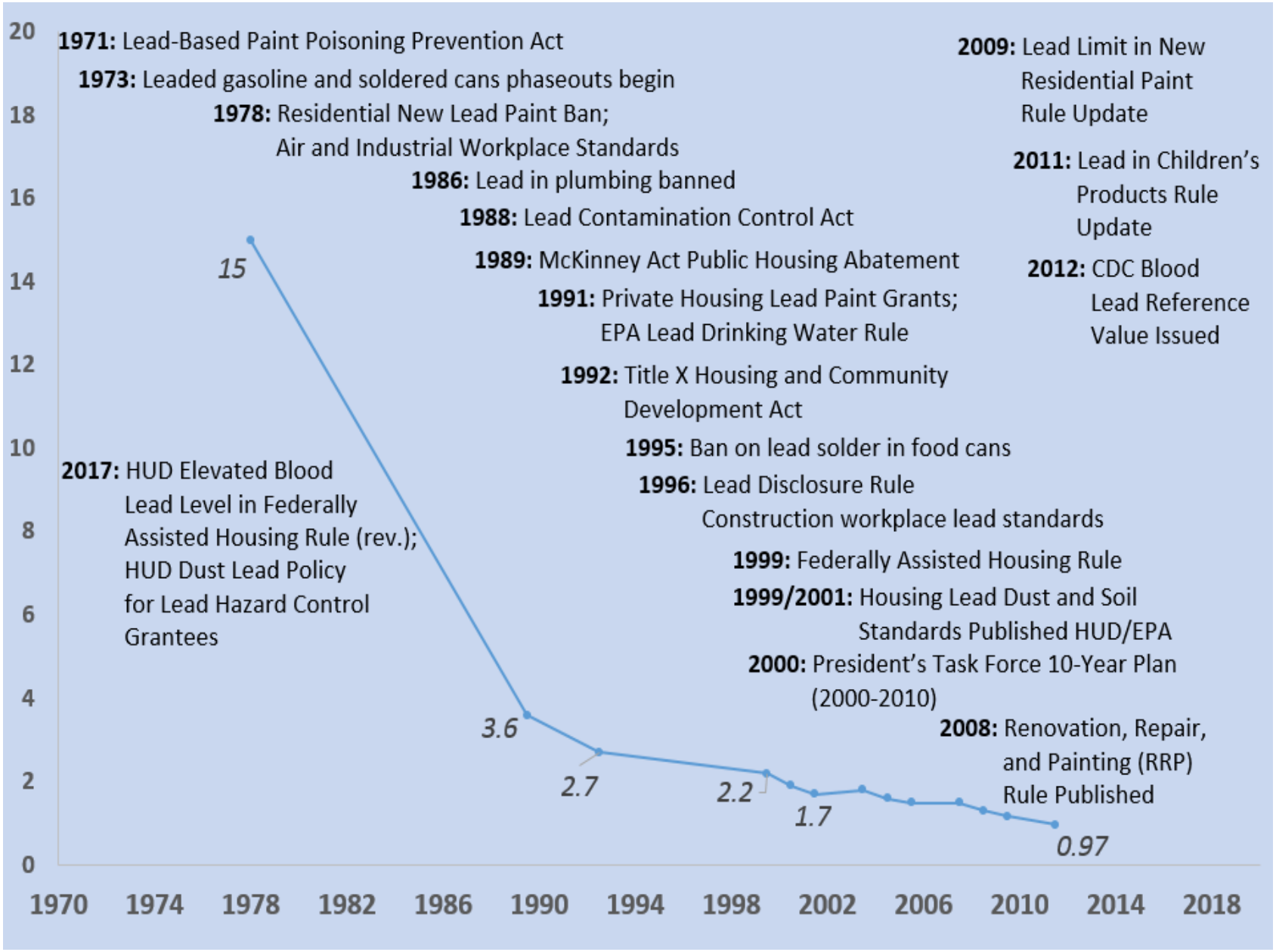
10 Policies to Prevent and Respond to Childhood Lead Exposure

An assessment of the risks communities face and key federal, state, and local solutions

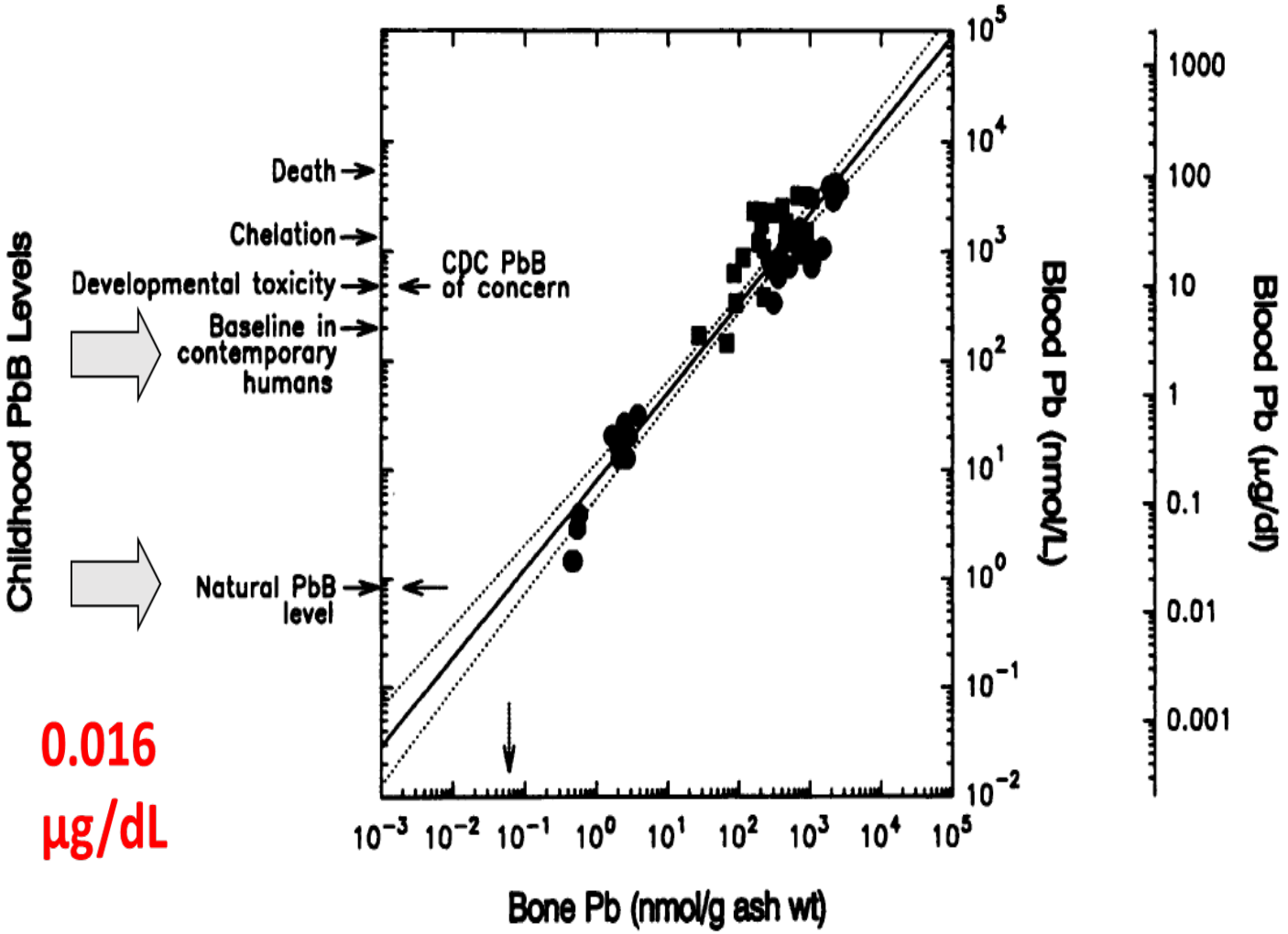
THE PEW CHARITABLE TRUSTS

Robert Wood Johnson Foundation

U.S. POLICIES VS. CHILDREN'S AVERAGE BLOOD LEAD



HAS THE LEAD PROBLEM BEEN SOLVED?



Source:
Smith, D. R., Flegal, A. R. (1992, November). The public health implications of humans' natural levels of lead. *American Journal of Public Health, 82*(11), 1565-1566.


ASPINALL'S ENAMEL
SURPASSES ALL OTHERS.
AVOID IMITATIONS.
THE FINEST COLORS IN THE WORLD
1837
LEAD
IS NOT MADE WITH LEAD AND IS NON POISONOUS
ASPINALL'S
OXIDIZED
ENAMEL
WORKS, NEW CROSS, LONDON
COLOURS PERFECT
SIXTY YEARS EVOLUTION IN DECORATIVE ART
1897
PARIS. 24 RUE ALIBERT
NEW CROSS LONDON. S.E.
NEW YORK. 98/100 BERKMAN

LEAD POISONING
AUSTRALIA, LATE 1800'S

EUROPEAN COUNTRIES THAT SIGNED THE BAN ON RESIDENTIAL LEAD PAINT (BY 1927)

Austria

Belgium

Bulgaria

Czechoslovakia

Estonia

France

Great Britain

Greece

Latvia

Poland

Romania

Spain

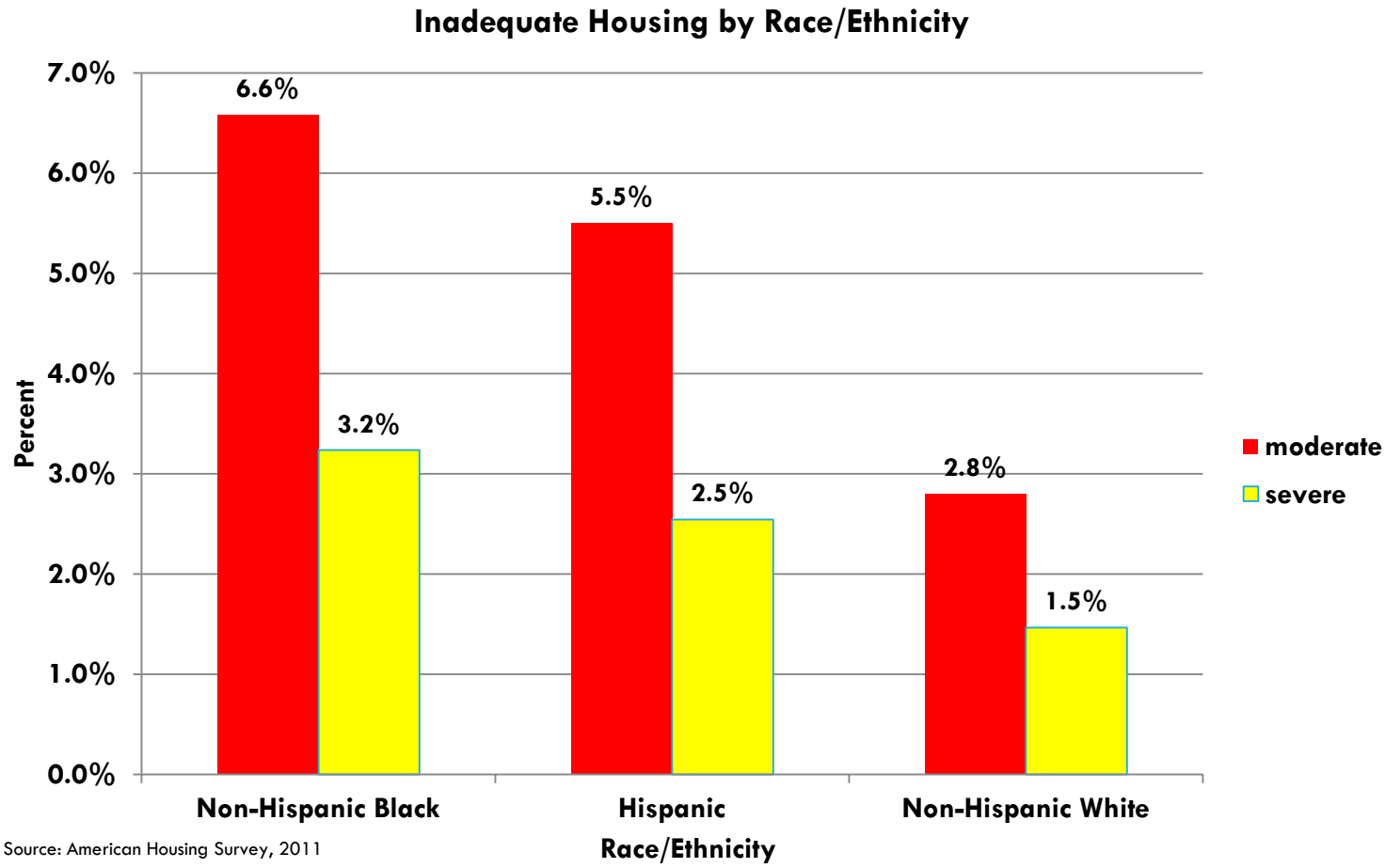
Sweden

Others

US Ban - 1978

Article 25(1) of the Universal Declaration of Human Rights

"Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control".



Source: American Housing Survey, 2011

PERSISTENT DISPARITIES IN HOUSING WITH SEVERE OR MODERATE PHYSICAL PROBLEMS

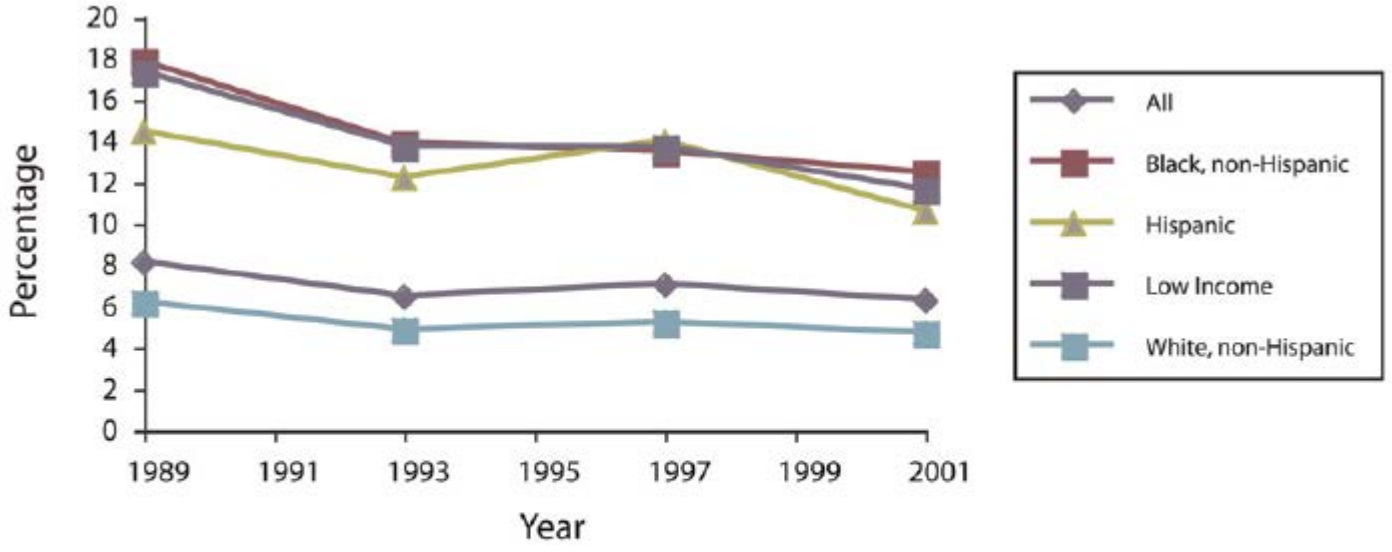
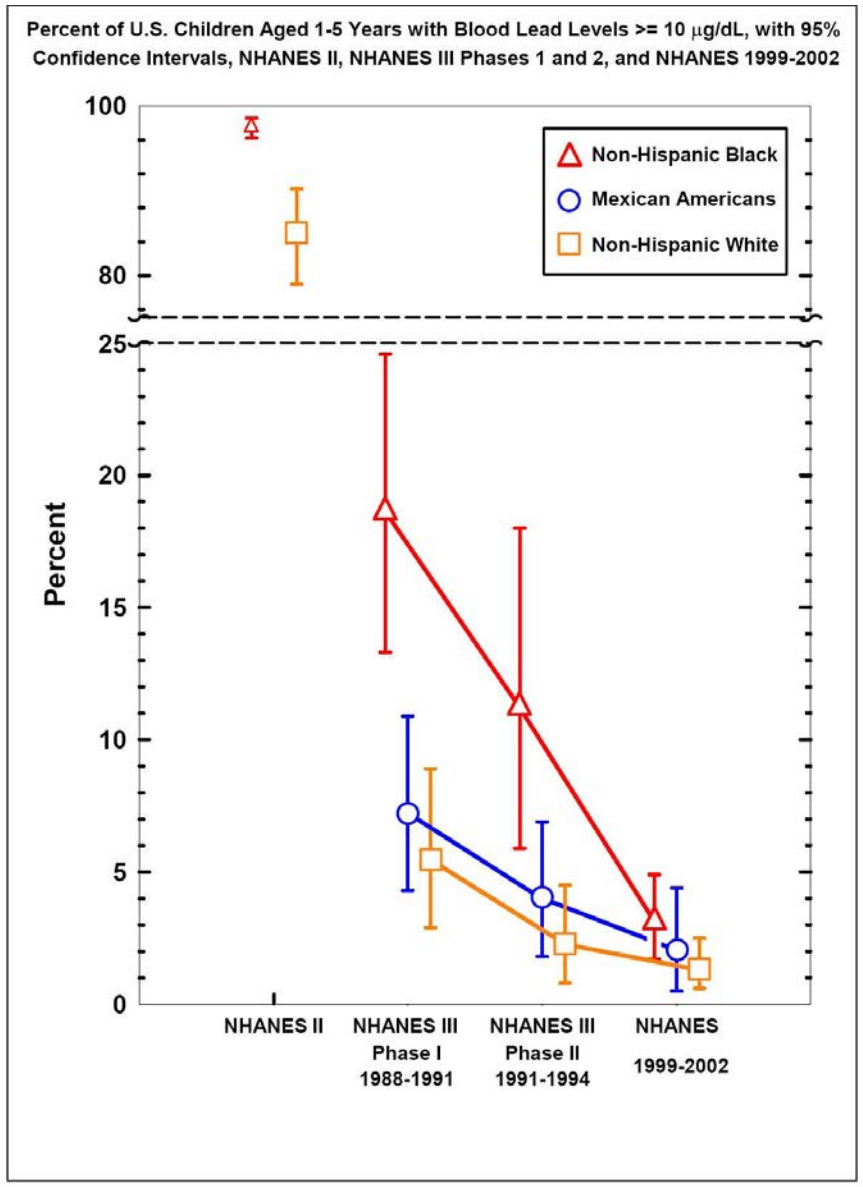
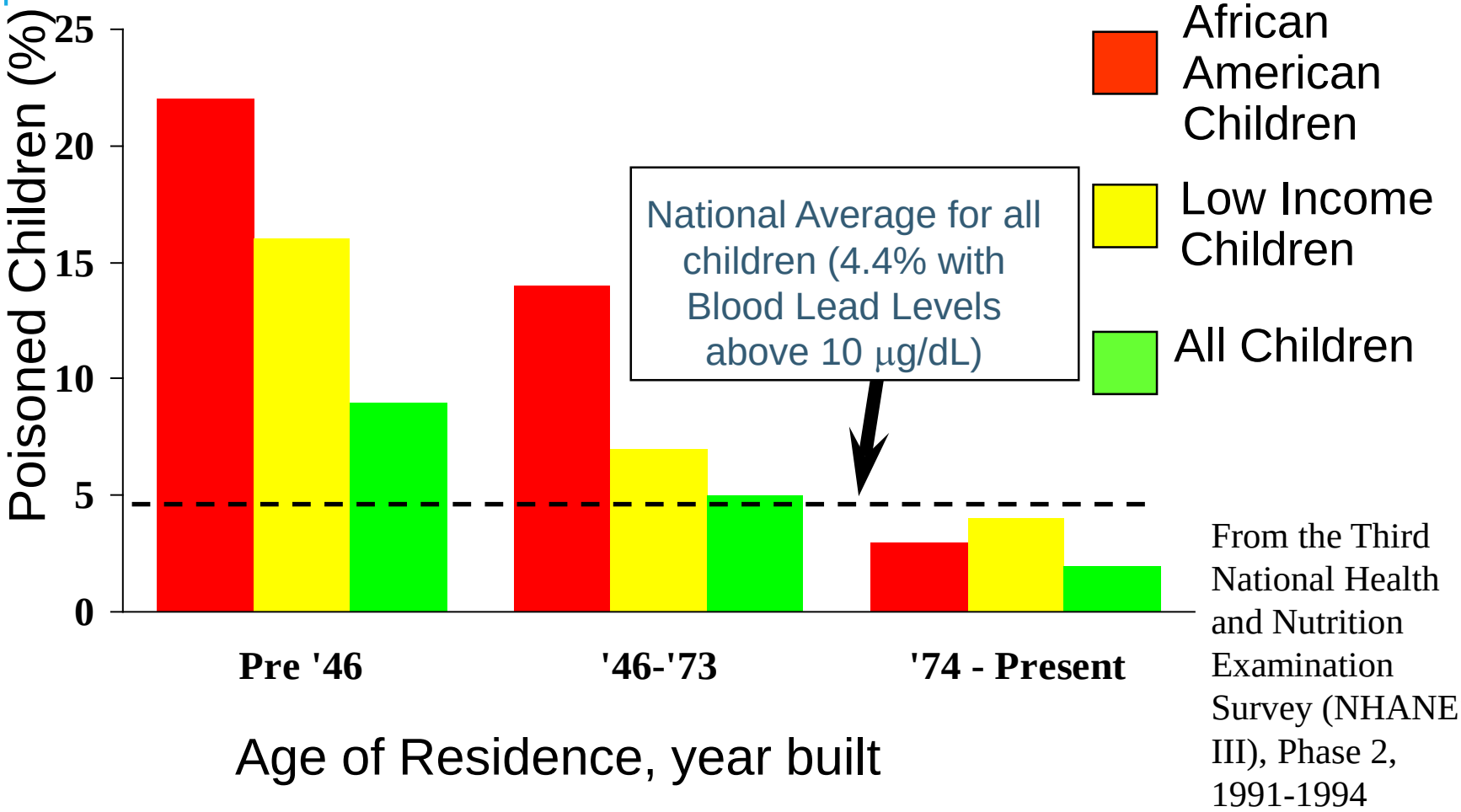


FIGURE 4—Percentage of housing with severe or moderate physical problems by race, ethnicity, and income: American Housing Survey, 1989–2001.


Percent of U.S. Children Aged 1-5 Years with Blood Lead Levels >= 10 µg/dL, with 95% Confidence Intervals, NHANES II, NHANES III Phases 1 and 2, and NHANES 1999-2002
Non-Hispanic Black
Mexican Americans
Non-Hispanic White
Percent
100
80
25
20
15
10
5
0
NHANES II
NHANES III Phase I 1988-1991
NHANES III Phase II 1991-1994
NHANES 1999-2002



From the Third National Health and Nutrition Examination Survey (NHANES III), Phase 2, 1991-1994

NET PRESENT VALUE

NPV compares the value of a dollar today to the value of that dollar in the future, taking inflation and returns into account. If the NPV of a prospective project is positive, it should be accepted. But if NPV is negative, the project may be rejected.

OFFICE OF MANAGEMENT AND BUDGET & NPV

The standard criterion for deciding whether a government program can be justified economically is the discounted monetized value of expected **net** benefits.

NPV assigns monetary values to benefits and costs, discounting future benefits and costs using an appropriate discount rate (3% or 7%), and subtracting the sum total of discounted costs from the sum total of discounted benefits.

Programs with **positive** net present value increase social resources and are generally preferred. Programs with **negative** net present value should generally be avoided.

LIMITATIONS

Intergenerational benefits not valued by discount rates

Who pays and who benefits

Costs are typically known but benefits often underestimated

REPORT

A report from the Health Impact Project | Aug 2017

HEALTH IMPACT PROJECT | Robert Wood Johnson Foundation | THE PEW CHARITABLE TRUSTS

10 Policies to Prevent and Respond to Childhood Lead Exposure

An assessment of the risks communities face and key federal, state, and local solutions

WHY CARE ABOUT ANOTHER LEAD REPORT?

Facts Are Stubborn Things, not “Alternative” Things

Science and Lead Poisoning Policy

Most of Human History and the Challenge to the Enlightenment

The first major lead report in 17 years

Qualitative Research

- 50 **interviews**
- 700 **research articles**
- 22 **case studies** (NCHH and TFAH)
- 5 national **listening sessions**
- 16 **Focus Groups:**

Quantitative

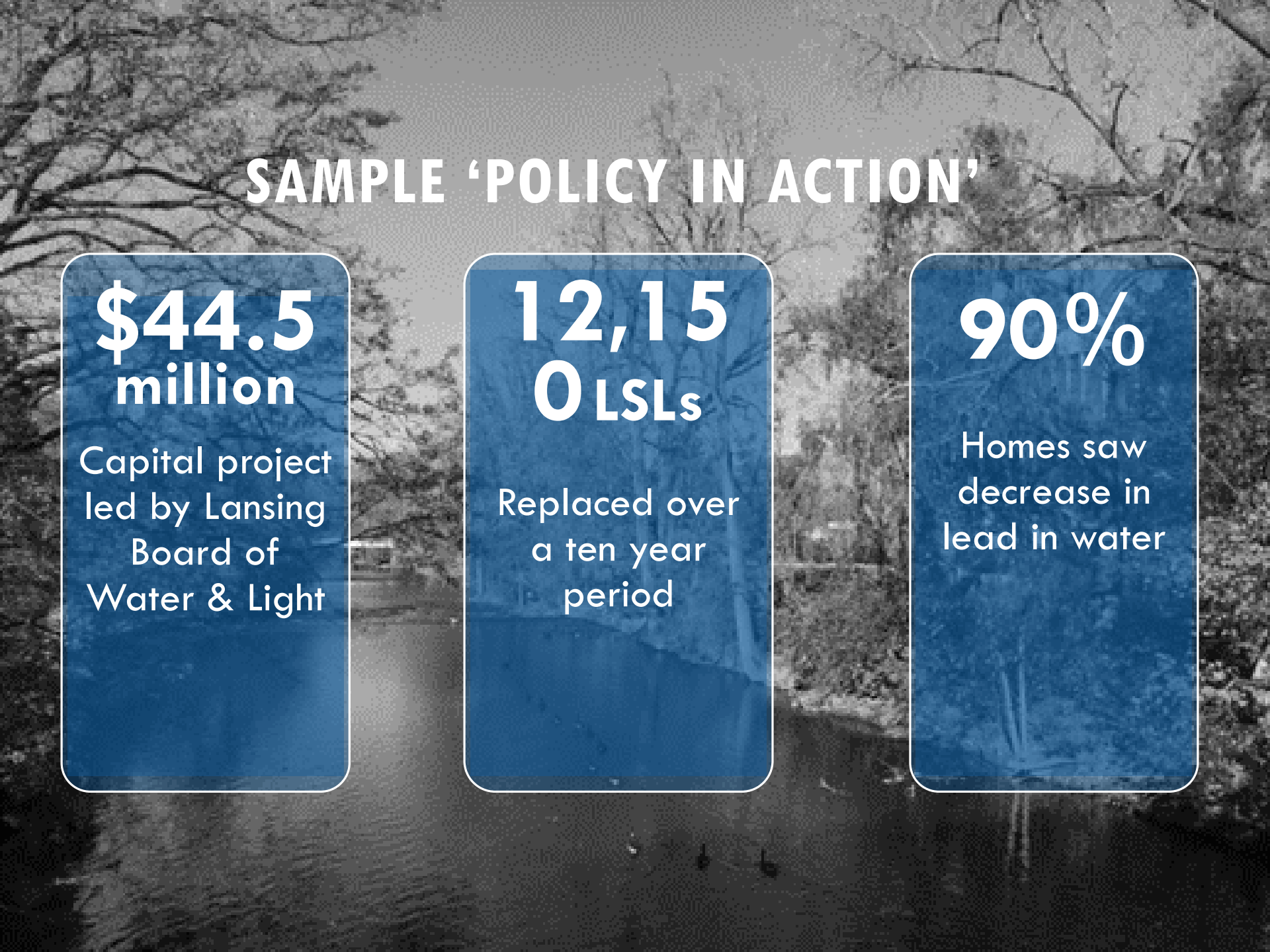
- Child Trends & Urban Institute, **Social Genome Model**
- Altarum Institute, **Value of Prevention Tool**

Project Oversight

- Subject matter experts
- Advisory committee
- Pew & RWJF

Funding

This report was funded by the Robert Wood Johnson Foundation with additional support from the Charles Stewart Mott Foundation



SAMPLE 'POLICY IN ACTION'

$44.5 million

Capital project led by Lansing Board of Water & Light

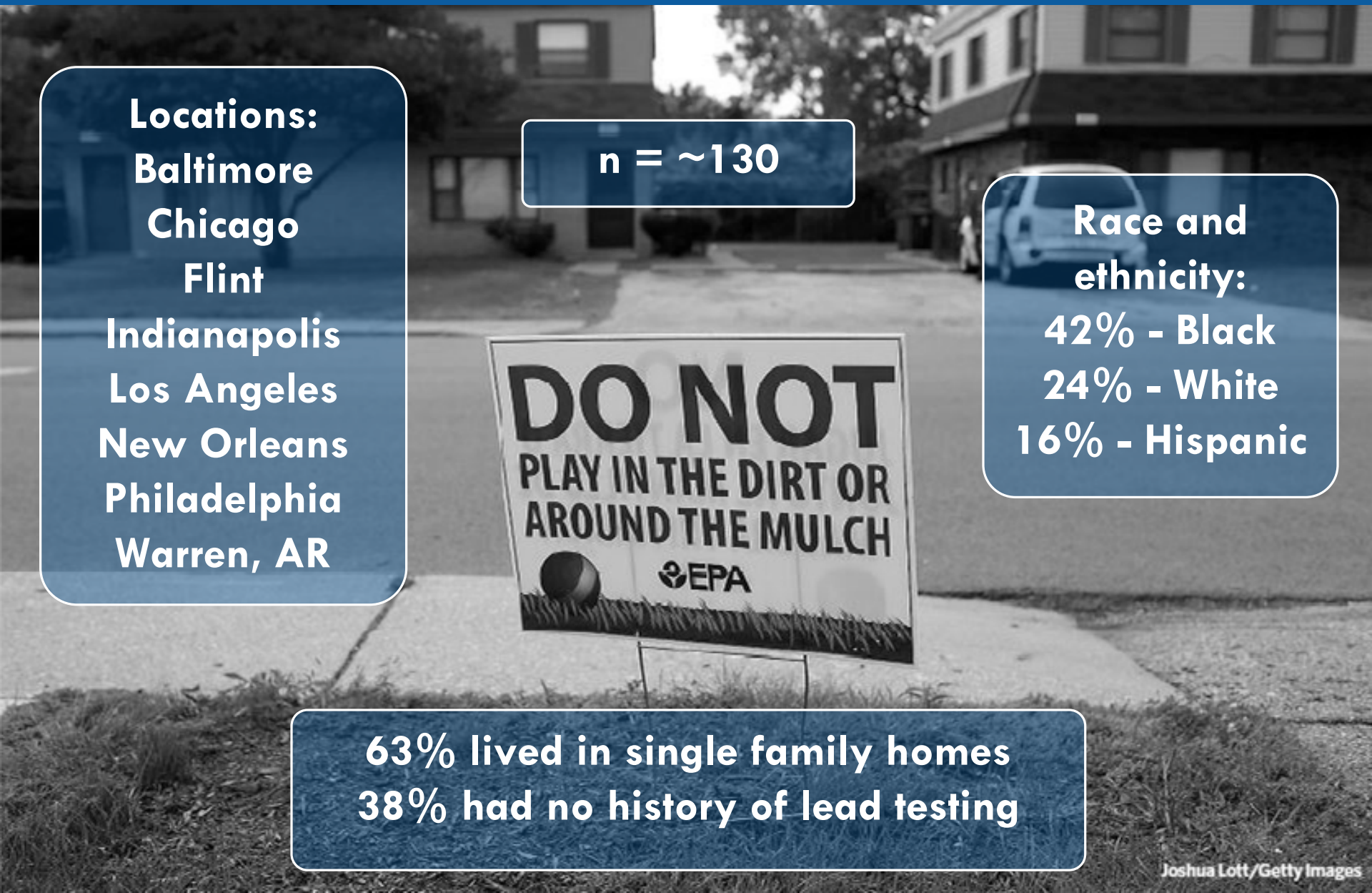
12,150 LSLs

Replaced over a ten year period

90%

Homes saw decrease in lead in water

Focus groups



Locations:
Baltimore
Chicago
Flint
Indianapolis
Los Angeles
New Orleans
Philadelphia
Warren, AR

n = ~130

Race and ethnicity:
42% - Black
24% - White
16% - Hispanic

63% lived in single family homes
38% had no history of lead testing

Joshua Lott/Getty Images

Social Genome Simulation Model

- Data from the BLS Children of the National Longitudinal Survey of Youth (CNLSY) and NLSY 79
- For each child, changes in reading and math scores, and behavior estimated for each 1 µg/dL of prevented blood lead from literature

Value of Prevention Tool

- Developed to measure nonclinical interventions on lifetime outcomes:
  - » Lifetime Earnings
  - » Health Spending
  - » QALYs
  - » Education Spending
- Earnings and Education impacts are modeled through impacts on IQ
- Health outcomes are modeled through increased risk for Hypertension and Cardiovascular disease

Comparison to Previous Cost-Benefit Analyses

- Includes the most recently available NHANES data on BLLs (2011-2014)
- Updated IQ/blood lead effect sizes
- Benefits of specific national policy interventions
- Measures an intervention for a single future birth cohort (4 million children in 2018)

Lead Paint Hazard Control in Older Homes

Assumptions for LHC models

Target population: Children in homes built either before 1960 or before 1978; 76% of pre-60 houses and 52% of pre-78 houses have LBP

Changes in Blood lead (effect size)

- Children's BLLs are 40% lower following lead hazard control
  - » Dust reduction - 12 yr HUD evaluation follow up
  - » Corresponding reduction in BLL from Dixon et al. 2009 using NHANES dust/blood study

Costs

- 100% of homes get inspection ($1K) and 76% or 52% (depending on housing age) get hazard control ($9K)

Safe Renovation, Repair, and Painting

Assumptions for RRP

Target population

- Children in a home with LBP and exposed to a renovation activity which would disturb this lead
  - » EPA estimates that 1.27 million children aged 0-5 are exposed to LBP and an RRP event each year
  - » 211,167 of a single cohort would be exposed

Changes in BLL (effect size)

- Exposure to a baseline (uncontrolled) RRP event results in an increase of **1.08 ug/dL** BLL relative to a controlled RRP event
  - » Derived from EPA Leggit model data for the Lead Renovation, Repair, and Painting Program Final Rule

Costs

- Additional costs per RRP event include training, additional labor, supplies and clearance testing after the event
  - » From Lead RRP Final Rule Economic Analysis: Increased cost per event of $302

Residential Full Lead Service Line Replacement

Assumptions for LSL replacement

Target population

- 6.9% of children, based on Cornwell et al. 2016 estimate of 22 million people with LSLs (6.9% of population)

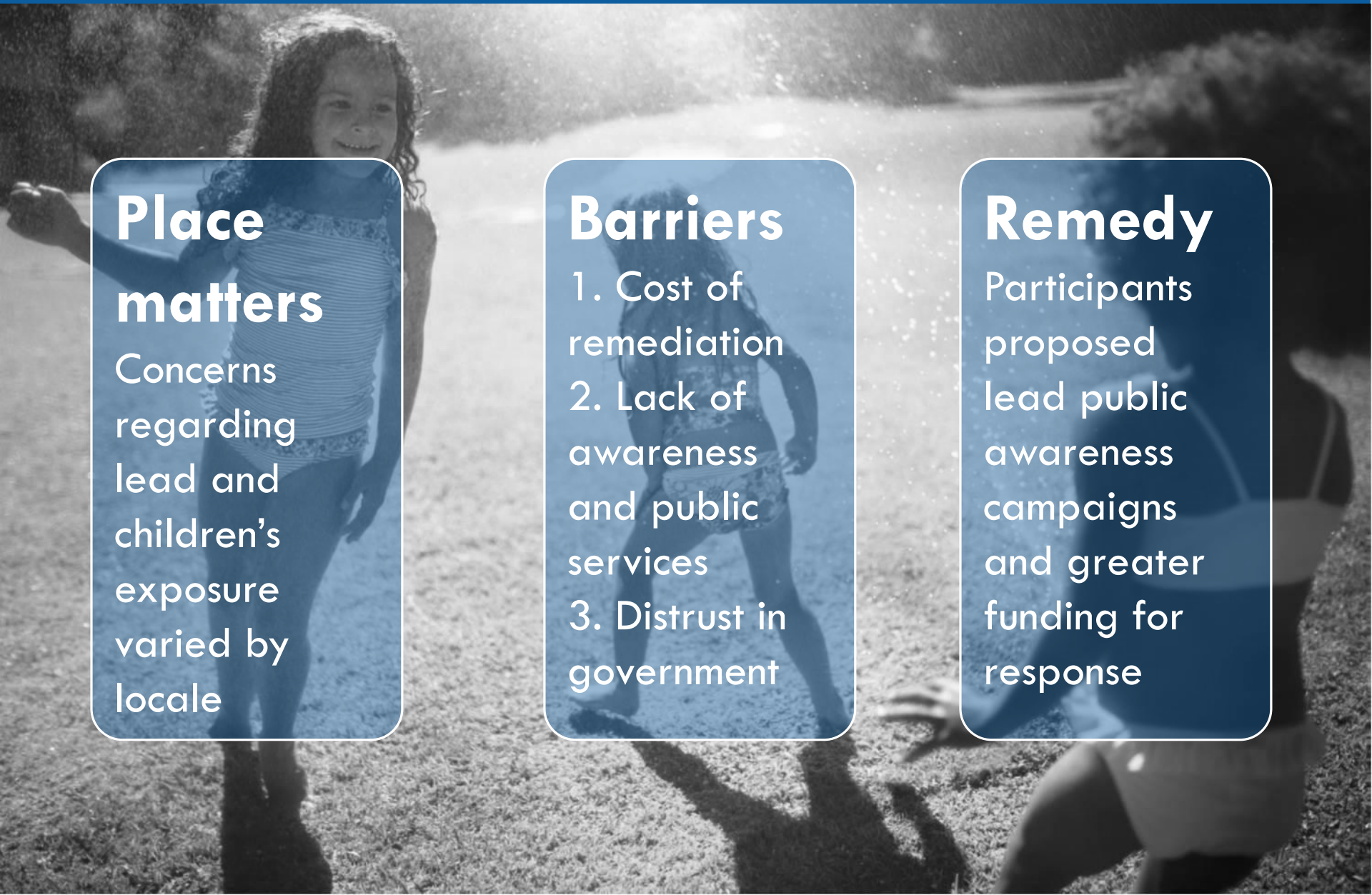
Changes in BLL (effect size)

- Replacing LSL leads to a 0.407 ug/dL decrease in BLL
  - » Reduces water lead from 11.6 ug/L to 2 ug/L (Deshommes and Provost).
  - » 1 ug/L change in water lead leads to a 0.04 ug/dL change in BLL, from updated IEUBK model estimates

Costs

- $6,000 to replace LSL (average)

Focus group findings



Place matters

Concerns regarding lead and children's exposure varied by locale

Barriers

1. Cost of remediation
2. Lack of awareness and public services
3. Distrust in government

Remedy

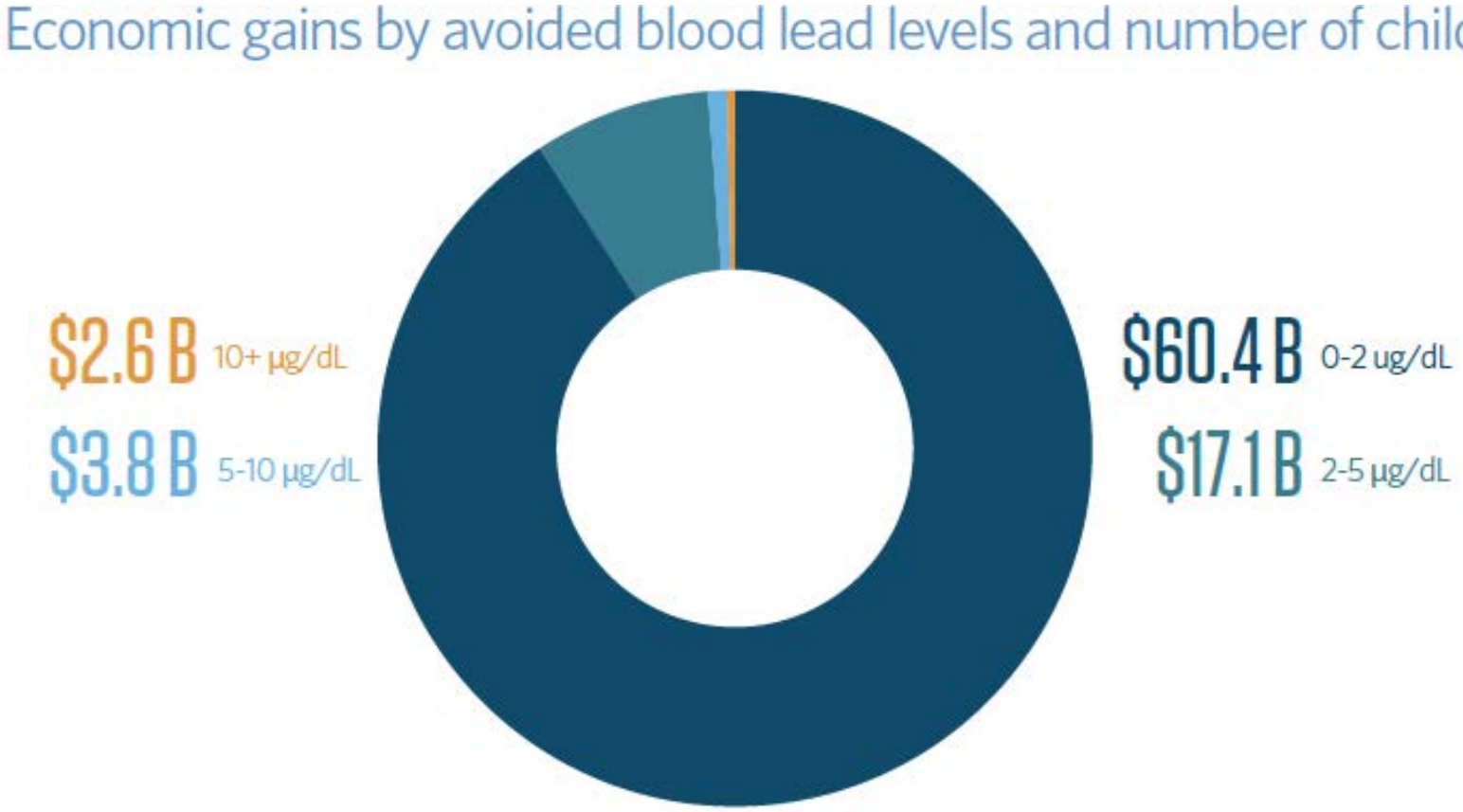
Participants proposed lead public awareness campaigns and greater funding for response

Every Dollar Invested in Full Lead Service Line Replacement Would Generate $.42 to $1.33 in Benefits

Cost-benefit analysis, for two initial water lead levels

Baseline estimates	Number and percentage of children born in 2018 into homes built before 1986 (1 child per unit)		2,352,000 (59%)	
	Percentage of those children in homes with potential lead service lines (LSLs)		6.84%	
	Average blood lead level for children without intervention		1.19 µg/dL	
	Starting level of lead in water (ppb)		11.4	5
Predicted impacts	Homes receiving lead service line replacement		272,000	
	Children affected (including future cohorts)		352,000	
	Expected decrease in water lead (ppb)		**9.4**	**3**
	Prevented blood lead level increase per child (µg/dL)		**0.40**	**0.13**
Gross future benefits	Initial cohort	Earnings	$2.0 billion	$640 million
		Health savings	$40 million	$10 million
		Education savings	$50 million	$20 million
		Quality-adjusted life years benefits	$80 million	$30 million
	Future cohorts (through year 10)		$550 million	$170 million
	Total gross future benefits		**$2.7 billion**	**$860 million**
	Share to federal government		**$480 million**	**$150 million**
	Share to state and local governments		**$250 million**	**$80 million**
	Share to households, the private sector, and other nongovernmental entities		**$2.0 billion**	**$630 billion**

Key Findings & Recommendations



- **Hypothetical "all blood lead levels at zero"**
  - Most gains are for children with blood lead levels under 2 ug/dL
  - Benefits are mainly derived from increased earnings, resulting from higher IQs
- **Modeled four primary prevention policies**
  - Lead-paint hazard control, lead service line replacement, enforcement of EPA's renovatio rule, and removal of lead from aircraft fuel

FINDING:

Eradicating lead paint hazards from ALL pre-1978 homes of children would provide $12.1 billion in future benefits, or approximately $1.17 per dollar invested, and protect more than 1.9 million children born in 2018 ALONE.

RECOMMENDATION:

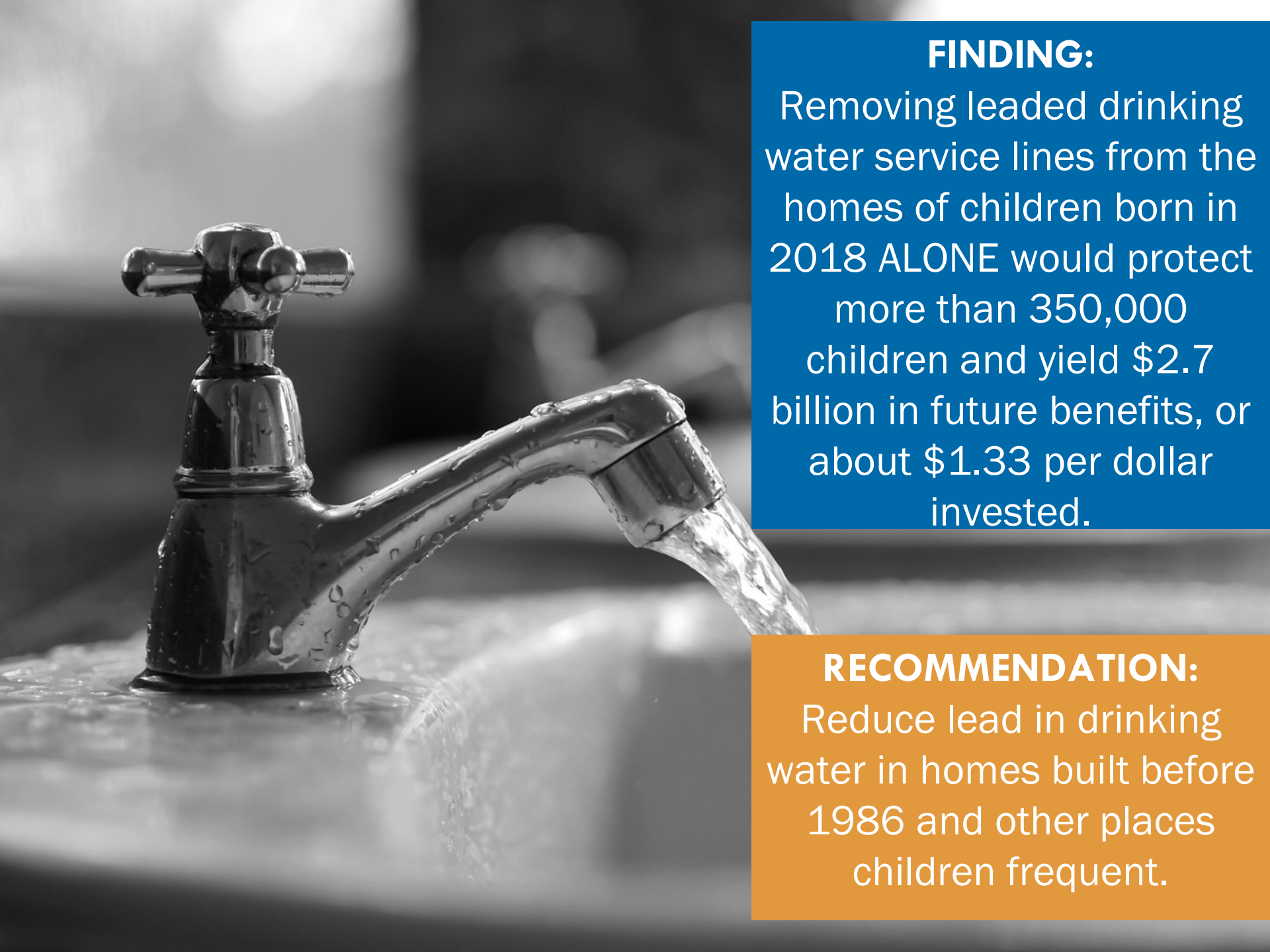
Remove lead paint hazards from housing before children are harme.

FINDING:

Eradicating lead paint hazards from **pre-1960** older homes of children from **low-income families** would provide $3.5 billion in future benefits, or approximately $1.39 per dollar invested, and protect more than 311,000 children born in 2018 ALONE.

RECOMMENDATION:

Remove lead paint hazards from low-income housing built before 1960 and other places children spend time.



FINDING:

Removing leaded drinking water service lines from the homes of children born in 2018 ALONE would protect more than 350,000 children and yield $2.7 billion in future benefits, or about $1.33 per dollar invested.

RECOMMENDATION:

Reduce lead in drinking water in homes built before 1986 and other places children frequent.

FINDING:

Ensuring that contractors comply with the Environmental Protection Agency's rule that requires lead-safe renovation, repair, and painting practices would protect about 211,000 children born in 2018 and provide future benefits of $4.5 billion, or about $3.10 per dollar spent.

RECOMMENDATION:

Increase enforcement of the federal renovation, repair, and painting rule.

ESTIMATED BENEFITS

Likely an underestimate:

Intangible Benefits (e.g. stress on parents and children, avoided lead paint litigation, special property maintenance, premature mortality from lead exposure in childhood, premature memory loss, treatment of dental caries associated with lead exposure, liver, kidney and other diseases associated with lead exposure, lead-associated criminal behavior costs beyond juvenile delinquency)

Discount Rate

Only counts children born in 2018

Other Recommendations

- Reduce lead in food and consumer products
- Clean up contaminated soil
- Improve blood lead testing among children at high risk of exposure and find and remediate the sources of their exposure.
- Improve public access to local data.
- Fill gaps in research to better target state and local prevention and response efforts

Read the report at www.pewtrusts.org/lead

A Few Recent Actions on Lead Poisoning Prevention

2012 – Declaration of the Lead and Environmental Hazards Association and the National Association of Lead and Healthy Homes Grantees

2016 – Declaration on Flint from LEHA, Grantees and the National Safe and Healthy Housing Coalition

2016 – Launch of Find It Fix It Fund It Campaign

2016 – Environmental Defense Fund Meeting

2016 – Lead Strategies Released

2016 – National Lead Summit

2017 – American Academy of Pediatrics Statement

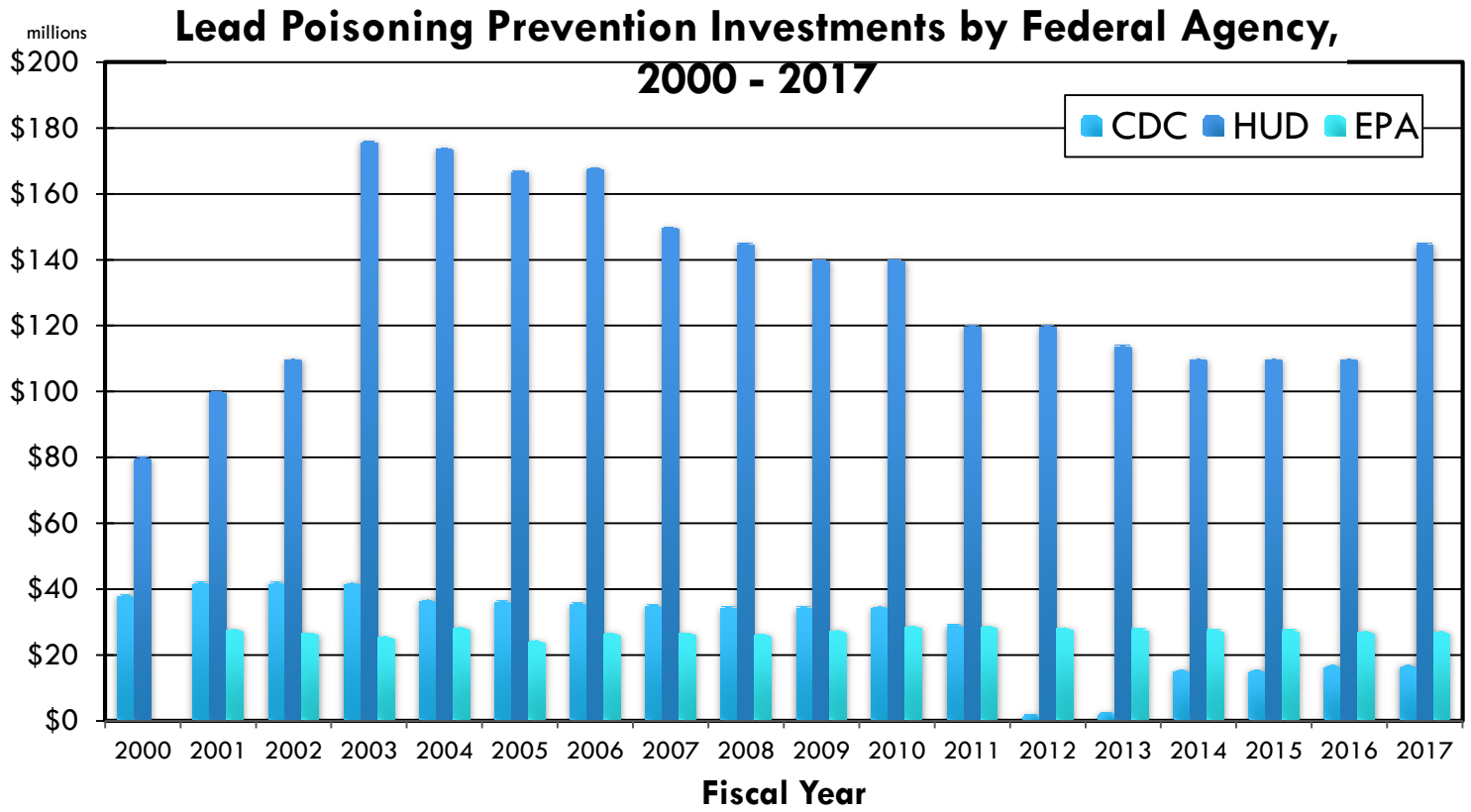
2017 – Testimony to EPA and HUD on Lead Regulations

2017 – Letter to Congress on Appropriations

2017 – 10 Policies to Respond to Childhood Lead Poisoning – Pew Report

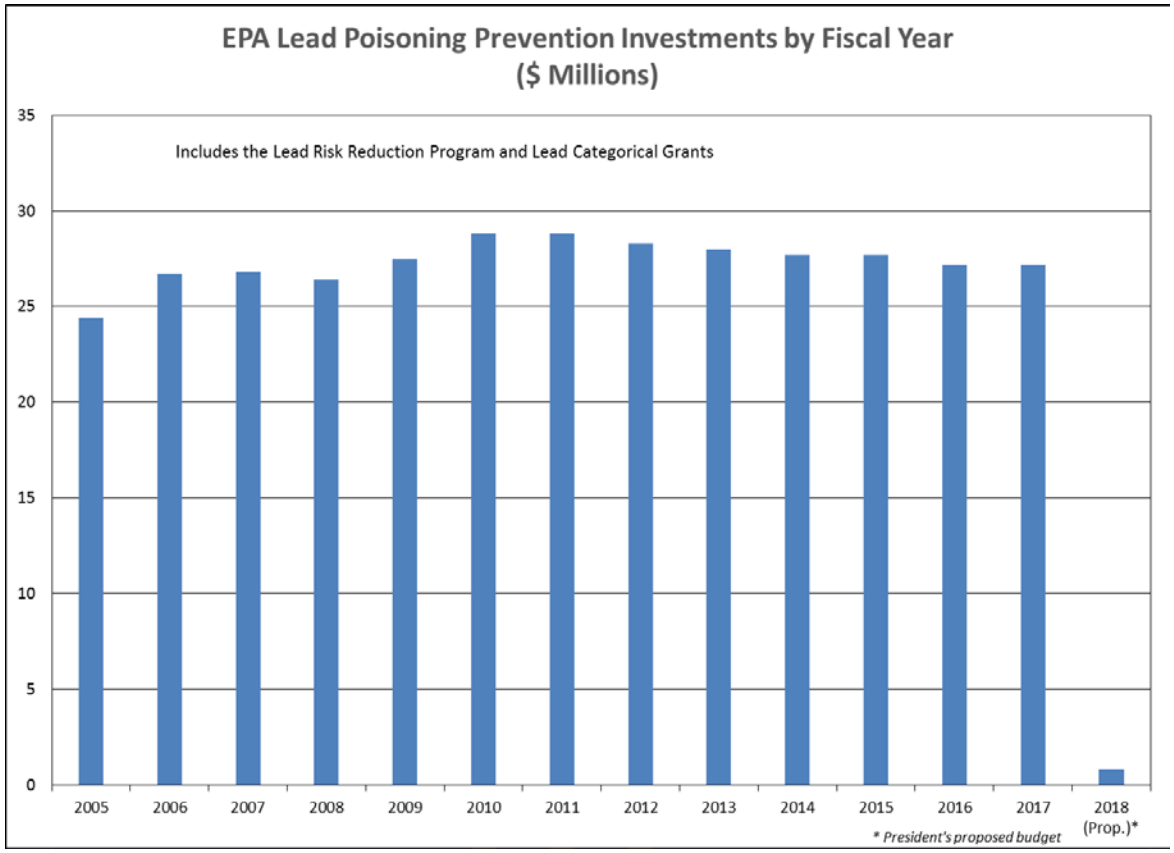
HUD, CDC AND EPA APPROPRIATIONS

National Safe and Healthy Housing Coalition



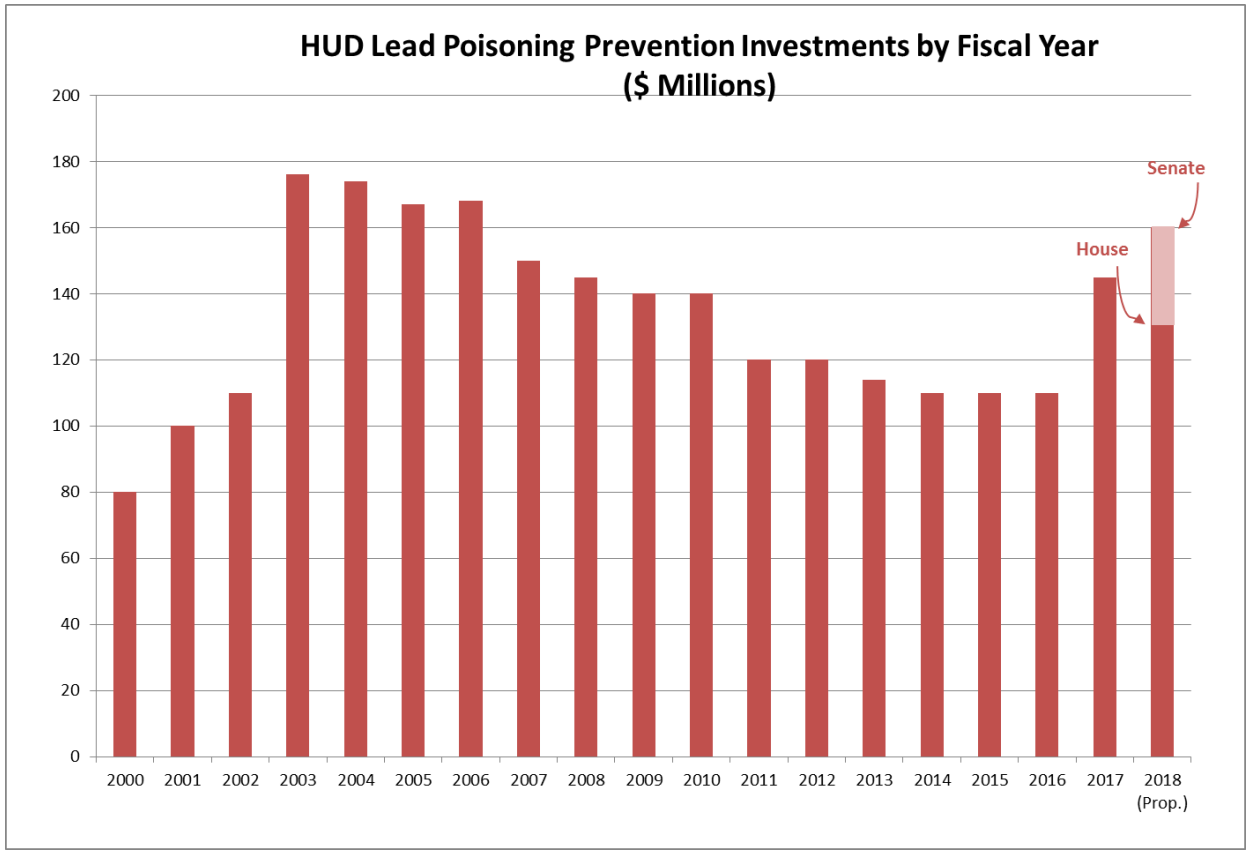
EPA

National Safe and Healthy Housing Coalition



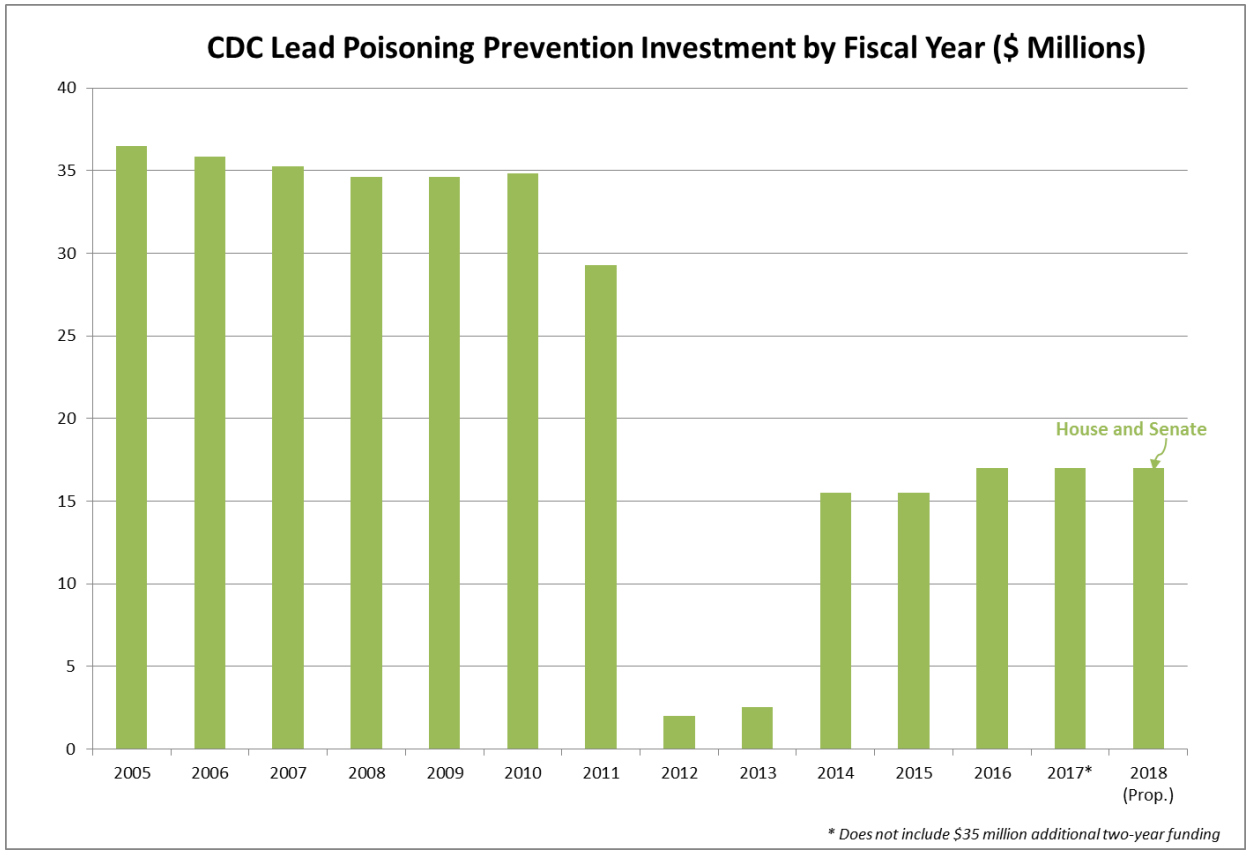
HUD

National Safe and Healthy Housing Coalition



CDC

National Safe and Healthy Housing Coalition



EPA

National Safe and Healthy Housing Coalition

Categorical Grants:	Appropriation								President's Budget	House	Senate	NSHH Coalition
	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 18	FY 18	FY 18
Lead	$14.564	$14.564	$14.512	$14.242	$14.049	$14.049	$14.049	$14.049	0	$14.049	TBA	$15
Radon	$8.074	$8.074	$8.045	$7.895	$8.051	$8.051	$8.051	$8.051	0	$8.051	TBA	$8.1

	Appropriation								President's Budget	House	Senate	NSHH Coalition
	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 18	FY 18	FY 18
Lead Risk Reduction Program	$14.329	$14.329	$13.798	$13.829	$13.745	$13.719	$13.275	$13.275	$.83*	Not included	TBA	$15
Indoor Air: Radon Program	$5.866	$5.866	$3.861	$3.875	$2.366	$3.055	$2.91	$2.91	0	Not included	TBA	$6
Reduce Risk from Indoor Air	$20.759	$20.759	$17.135	$17.288	$14.508	$13.552	$13.733	$13.733	0	Not included	TBA	$20
Children and Other Sensitive Populations	$7.1	$7.1	$7.481	$7.533	$6.548	$6.548	$6.548	$6.548	$2.081	$5.566	TBA	$7

HUD

National Safe and Healthy Housing Coalition

HUD OLHCHH Programs:	Appropriation								House	Senate	NSHH Coalition
	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 18	FY 18 Request
Lead Hazard Control and Demonstration Programs	$114.6	$94.11	$107.5	$101	$91	$93	$88	$110	$100	$125	$189
Healthy Homes Programs	$20	$23.253	$10	$10	$15	$15	$20	$30	$25	$30	$35
Technical Studies	$4	$1.199	$2.5	$3	$4	$2	$2	$5	$5	$5	$6
Total	***$140***	***$119.76***	***$120***	***$114***	***$110***	***$110***	***$110***	***$145***	***$130***	***$160***	***$230***

MAKING A DIFFERENCE

“Making a difference” or “having a social impact” can be measured by:

The number of people whose lives you improve, and how much you improve them.

Includes happiness, health and a lack of suffering.

Solving problems faster than they would have been solved otherwise.

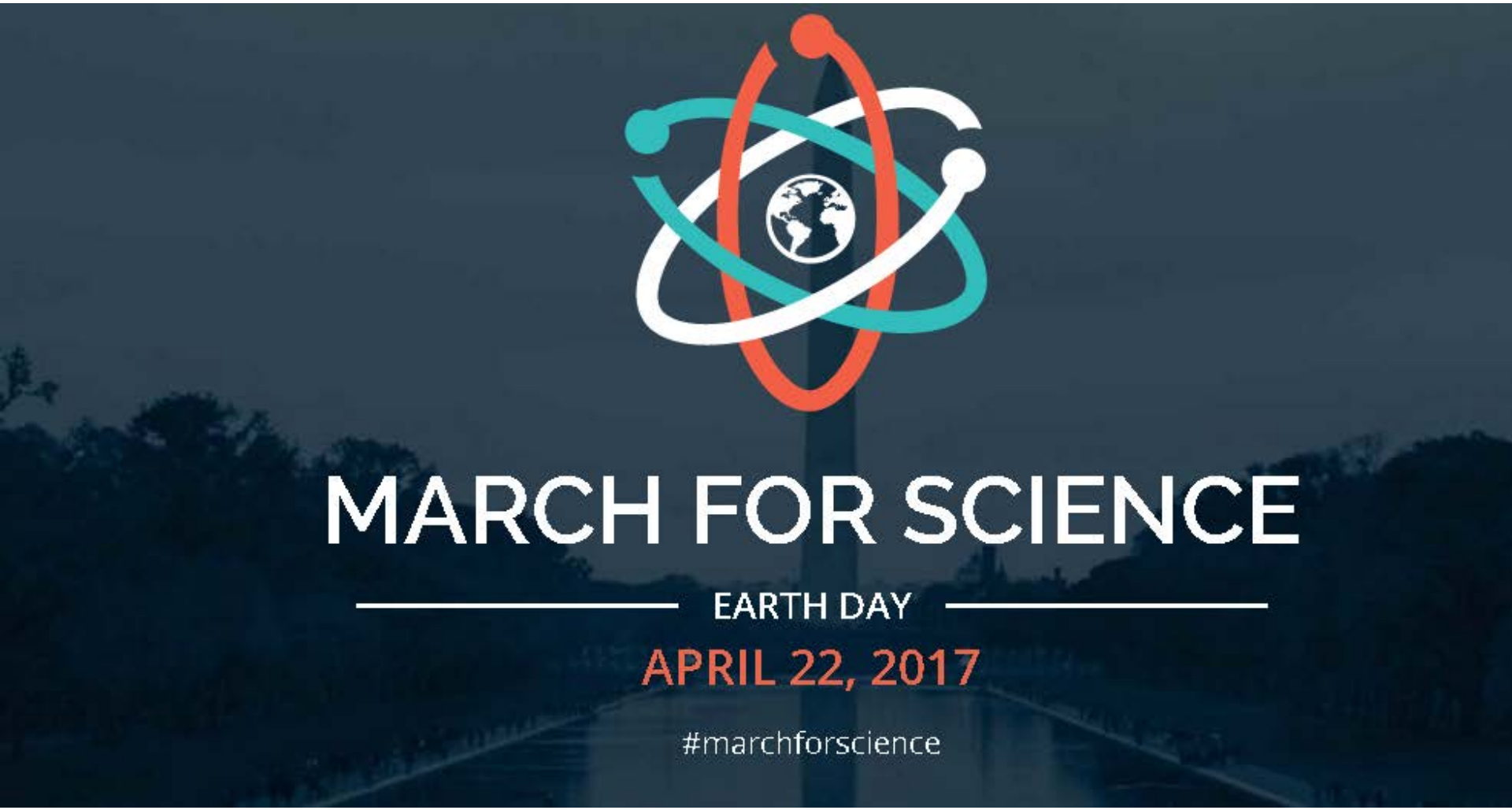
THE DUTCH BOY'S LEAD PARTY

A Paint Book for Girls and Boys

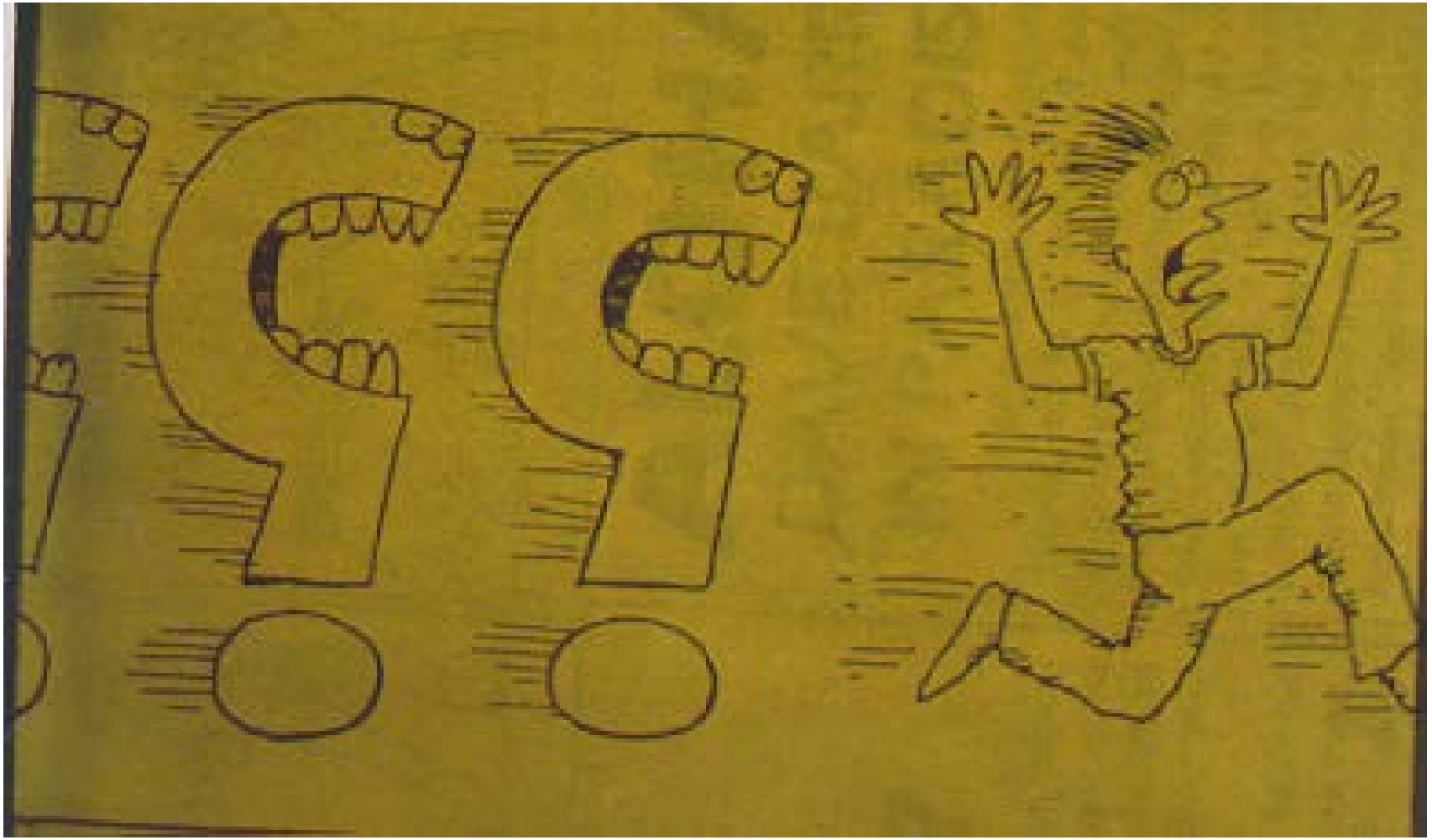
With which is bound

COLOR HARMONY IN THE HOME

A Booklet for the Grown-ups


MARCH FOR SCIENCE
EARTH DAY
APRIL 22, 2017
#marchforscience


Think
Like A
STAY



- National Safe and Healthy Housing Coalition http://www.nchh.org/Policy/National-Safe-and-Healthy-Housing-Coalition.aspx

www.nchh.org ♦ @NCHH ♦ facebook.com/HealthyHousing

National Center for HEALTHY HOUSING

Green & Healthy Homes Initiative®

EPA Region 5 Lead Work Shop

September 26, 2017

GHHI's History

Green & Healthy Homes Initiative®

1986
Parents Against Lead, a grassroots organization dedicated to fighting lead poisoning, is founded in Baltimore.

1993
The Coalition to End Childhood Lead Poisoning forms, with mission to end childhood lead poisoning in Baltimore.

1997 Began nation's first comprehensive healthy homes program

2000 Raises $50 million to fight lead poisoning in Maryland and creates Clean Hands legislation

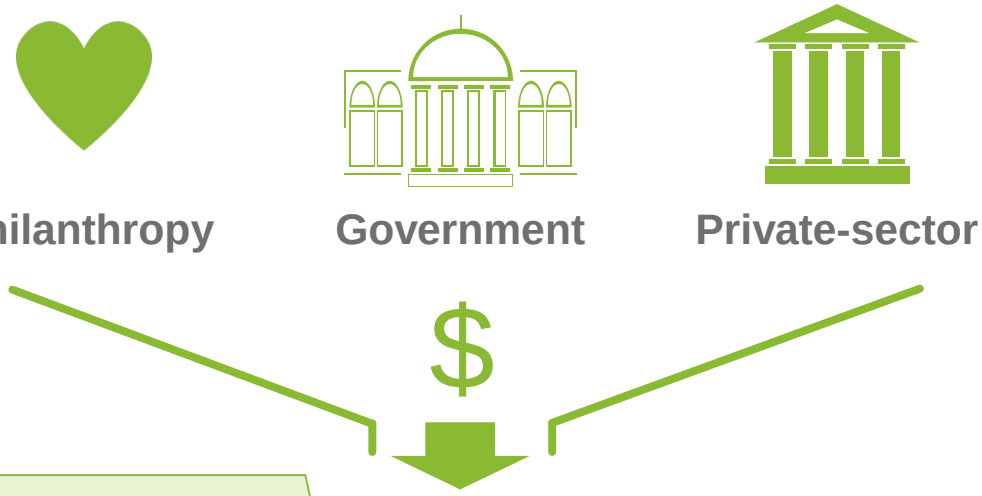
2009
Coalition rebranded as National Green & Healthy Homes Initiative, reaches 98% reduction in lead poisoning in Maryland

2016
Authors; *Strategic Plan to End Childhood Lead Poisoning: A Blueprint for Action* is published, holds Lead Summit, Declares 5 Year Plan to End LP

2017
Achieves Lead Safe Housing Rule, Launches Fund to End Lead Poisoning and Advances Social Impact and Policy Work.

Green & Healthy Homes Initiative®

Breaking the link between unhealthy homes and unhealthy families to improve health, economic, and social outcomes.



System
- Single intake system
- Comprehensive assessment
- Coordinate services
- Integrated interventions
- Cross-trained workers
- Shared data

Outcomes
- Lead-hazard reduction
- Asthma-trigger control
- Household injury prevention
- Energy efficiency
- Weatherization
- Housing rehabilitation

Accomplishments
- 98% reduction of lead poisoning in Maryland
- 35 pieces of legislation passed
- 25 GHHI-designated sites across the country
- Over $300 million raised
- Over 500,000 integrated healthy homes, lead hazard reduction, and energy efficiency units in partnership with HUD

Source(s): GHHI

- **Passed first law in the nation in 1994** requiring mandatory proactive rental inspections (PRI) and remediation for lead
- Passed Clean Hands Bill legislation denying access to rent court for owners who are out of compliance with Maryland's lead law
- Established Rent Escrow right for tenants for lead hazard remediation in non-compliant properties

Green & Healthy Homes Initiative®

Five Key Recommendations:

1. Increase federal budget to $2.5B annually

2. End the sale of federally owned or insured properties containing lead hazards

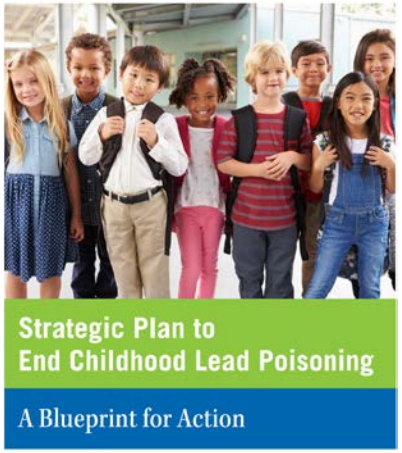
3. Adopt a Lead Safe Income Tax Credit

4. Medicaid should cover lead hazard control interventions for children with EBLs of 5 mg/dL or higher

5. Require all federal grantees to have adopted the CDC threshold level.

Strengthening the Call to Action

- Pew/RWJF: *10 Policies to Prevent and Respond to Childhood Lead Exposure*
- Find It, Fix It, Fund It
- Earthjustice Plan of Action to Prevent Childhood Lead Exposure
- Pew: 10 Policies to Prevent and Respond to Childhood Lead Exposure



Campaign to End Lead Poisoning

Green & Healthy Homes Initiative®

GHHI's Lead Poisoning Prevention Catalytic Award Competition

- $25,000 cash
- $10,000 in Technical Assistance from GHHI in the area of your choice:
  - Communications
  - Data
  - Project Implementation
  - Financing Strategies
  - Policy

With support from

- To lift up best practices towards our shared goal of eradicating lead poisoning
- Nonprofits, state and local agencies from anywhere in the US are eligible to apply
- **Proposals due Sept. 30, 2017**

Sustainable Funding for Lead Poisoning Prevention

Green & Healthy Homes Initiative®

Rule 1115 Waiver

2009: CMS approved Rhode Island's Comprehensive Demonstration 1115 Waiver, allowing RI's Medicaid Program, RIte Care to cover:

- Case management
- Education
- Lead assessment
- Window replacement for children with EBL.

CHIP State Plan Amendments

2016: CMS approved a Health Service Initiative submitted by Michigan Medicaid, included funding of $119 million over five years for abatement of lead hazards and related costs.

2017: CMS approved Maryland for $7.2 million in annual funding for lead hazard reduction and asthma trigger reduction related costs.

2017: State of Ohio pending.

Learning From Other Local Best Practices

Green & Healthy Homes Initiative®

City of St. Louis

- GHHI St. Louis Comprehensive Lead Poisoning Prevention Action Plan in 2003; Resulted in lead poisoning decline in City from 23% in 2003 to 1.7% in 2014

City of Rochester

- Passed ordinance in 2005 requiring lead remediation and lead certification of rental properties

City of Philadelphia / City of Baltimore

- Dedicated Lead Court Dockets

City of Lewiston, ME / City of Baltimore

- Passage of Lead Safe Demolition Standards

State of Maine

- Passed landmark legislation in 2015 mandating environmental investigation at 5 µg/dL and providing funding for 6 new sanitarians

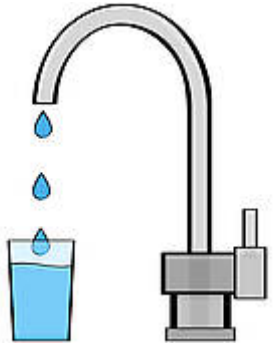
City of Toledo

- Passed ordinance in 2016 requiring lead remediation and lead certification of rental properties

City of Buffalo

- Mayor's 11 Point Lead Poisoning Prevention Plan

Housing
Increase state & local lead hazard reduction funding and target effectively to most at-risk jurisdictions



Drinking Water
Determine the extent of exposure in NJ and update infrastructure to mitigate lead risks

Schools
Increase funding to keep schools lead-safe: remediate drinking water infrastructure in Abbott School Districts, especially Head Start and Early Head Start

Soil
Stronger standards for lead in soil

Improvements to Services:

- Increase Medicaid funding to support services to families and children to reduce lead exposure and address the causes of lead poisoning
- Explore adoption of a statewide integrated housing services delivery model to coordinate health, energy and housing services across State agencies and sectors

Increase Primary Prevention:

- Implement & evaluate a risk-based pilot program
- Tiered approach to services for families at time of pregnancy or birth in NJ
- Increase screening and mitigate lead exposure risks

Business Case for Lead Poisoning prevention

Every $1 spent on lead prevention programs

$17-$221 return on investment

Every 2.2 to 4.7 IQ point increase

Increased lifetime worker earnings of $955,000 per child

Source: HUD, Gould

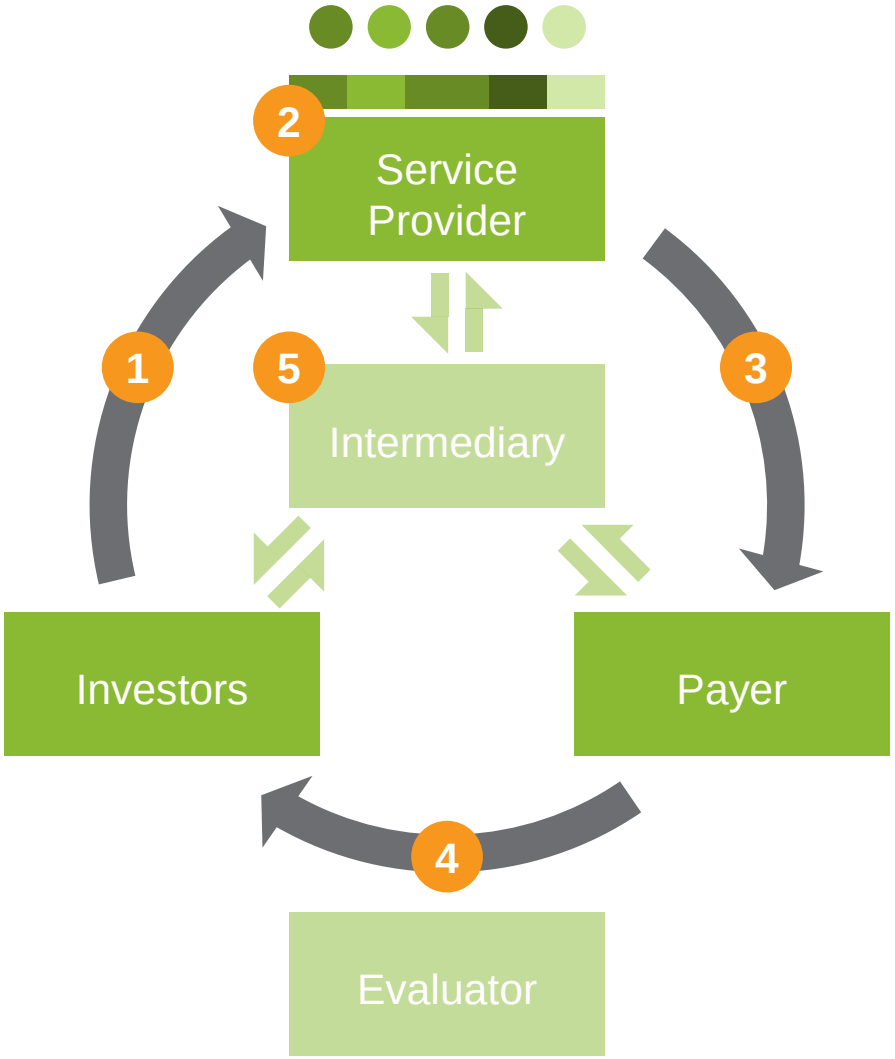
Green & Healthy Homes Initiative®

What is PFS financing?

Pay for Success (PFS) financing models are cross-sector partnerships in which private investors pay upfront for a social service and then government, healthcare, or other payers repay the investment if, *and only if,* predetermined outcomes are met.

Outputs → 

The Pay for Success Model



Steps

1. Investors provide upfront capital for service delivery
2. Service Provider implements intervention for target population
3. Intervention results in a benefit to the Payer, usually cost savings
4. Payer repays Investors if and only if outcomes are verified, often by independent Evaluator
5. An intermediary may provide project and financial management services

PFS model for lead poisoning prevention

Green & Healthy Homes Initiative®

Lead Executive Agency (Federal or State)

CMS	Department of Justice	Department of Education	HUD	State Programs	County Programs	City Programs
• Medicaid • Medicare	• Enforcement • Legal, and • Public trust.	• Special education,	• Lead-hazard reduction demonstration • Lead-hazard control program	• Childhood Lead Poisoning Prevention Program • Social Services	• Schools, • Special Ed, • Health Dept.	• Housing and Community Development Department

Rate card:

- Set a single rate card representative of cross-government savings.

$

Financing options:

- Private partners can raise their own funds; or
- Government backing to issuing a true bond.

Source(s):

Questions?

Michael McKnight
VP of Policy and Innovation
mmcknight@ghhi.org

Website: www.ghhi.org

Twitter: @HealthyHousing

Facebook: GHHInational

Instagram: healthy_housing

Lead Workshop for Communities
Chicago, Illinois
September 26, 2017
Links to Tools and Resources

- National Lead Summit, 2017 Playbook

- President's Task Force on Environmental Health Risks and Safety Risks to Children, *Key Federal Programs to Reduce Childhood Lead Exposures and Eliminate Associated Health Impacts*, November 2016

- The Pew Charitable Trust, Health Impact Project, *10 Polices to Prevent and Response to Childhood Lead Exposure*, August 2017

- National Center for Healthy Housing, *Find It, Fix It, Fund It: A Lead Elimination Action Drive*, December 2016

- Dr. David Jacobs, Environmental Health Disparities in Housing, *American Journal of Public Health*, 2011

- Amanda Reddy and David Jacobs, Building Justice: Genetic Code, ZIP Code, and Housing Code All Affect Health and Equity, *City Limits*, October 3, 2016

- Dr. David Jacobs and Anita Weinberg, Infrastructure and Mortgages: What about the Kids? February 22, 2017

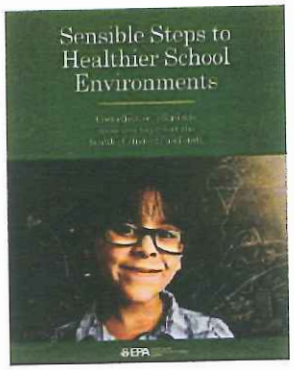
- US EPA's Environmental Justice Screening tool: EJSCREEN

- Community-Focused Exposure and Risk Screening Tool (C-FERST): C-FERST

Resources for Children's Environmental Health, Healthy Homes and Healthy Learning Environments

For more information, please contact:

Maryann Suero, PhD
Environmental Health Scientist
Children's Health Program Manager
(312) 886-9077
suero.maryann@epa.gov



http://go.usa.gov/v93Y

Holistic EPA CEH Resources
More information about many topics...

- EPA Children's Health Website www.epa.gov/children
- EPA School Website , www.epa.gov/schools
- EPA On-Line Resources for Healthy Child Care www.epa.gov/childcare/

Single Issue Resources

- Lead www.epa.gov/lead
- Pesticides www.epa.gov/pesticides
- Radon www.epa.gov/radon
- Mercury www.epa.gov/mercury
- Asthma www.epa.gov/asthma
- Indoor Air Quality ww.epa.gov/iaq
- Mold www.epa.gov/mold

Great Lakes Center for Children's Environmental Health

866-967-7337, 312-864-5526

Co-funded by EPA and ATSDR

Serves as a Regional resource, usually at no charge, to:

- evaluate, treat and prevent environmental illness in children; consultation & referral
- train pediatricians and others in environmental health issues
- promote children's environmental health in communities

More information at www.pehsu.net

Make YOUR House A Healthy Home

http://www2.epa.gov/children/healthy-home-action-brochure-english

https://www.epa.gov/children/healthy-home-action-brochure-spanish

OUR FACULTY

Center Director
Susan Buchanan, MD, MPH

Stronger Hospital of Cook County
Steve Aks, MD, FACMT
Mark Mycek, MD, FACMT
Ann Naughton, RN, MPA, COHN-S

University of Illinois Hospital
Peter Orris, MD, MPH

Ann & Robert H. Lurie Children's Hospital of Chicago
Helen Binns, MD, MPH

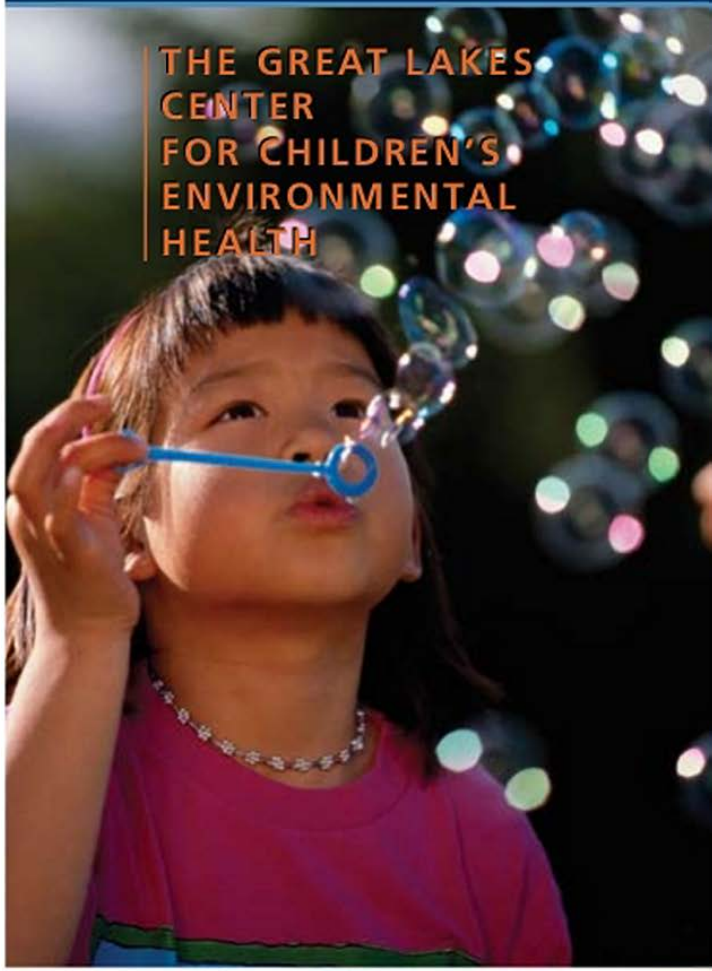
Cincinnati Children's Hospital Medical Center
Nick Newman, MD, MPH

Center Coordinator
Patricia Lasley, MPH

Great Lakes Center for Children's Environmental Health
University of Illinois at Chicago
School of Public Health
835 S Wolcott, Suite E-144
Chicago, Illinois 60612

Providing expert clinical and public health evaluations of children and communities with suspected environmental health problems

THE GREAT LAKES CENTER FOR CHILDREN'S ENVIRONMENTAL HEALTH



Affiliated with
Great Lakes Centers
University of Illinois at Chicago
School of Public Health

Division of Toxicology
Stroger Hospital of Cook County in Chicago

Toxikon Consortium

Cincinnati Children's Hospital

OUR MISSION

The Great Lakes Center for Children's Environmental Health exists to promote the environmental health of children in the Midwest region. The center is a Pediatric Environmental Health Specialty Unit which is supported by the Agency for Toxic Substances and Disease Registry and the United States Environmental Protection Agency. The center is located at University of Illinois at Chicago School of Public Health and is affiliated with the John H. Stroger, Jr. Hospital in Chicago, the Toxikon Consortium, and the Cincinnati Children's Hospital. The center is a member of the Association of Occupational and Environmental Clinics.

OUR SERVICES

Clinical Evaluations
The center and its affiliates have multidisciplinary pediatric environmental health clinic staffed by experts in environmental medicine, pediatrics, clinical toxicology, and industrial hygiene. The staff evaluates children and families exposed to environmental stressors such as heavy metals, pesticides, mold, and other indoor and outdoor environmental pollutants. The clinics are located at John H. Stroger, Jr. Hospital, the Occupational & Environmental Consultation Clinic at the University of Illinois at Chicago and the Cincinnati Children's Hospital.

Telephone Consultations
The center provides telephone consultations to families and their health care providers on children's environmental health issues. Telephone consultations are provided Monday to Friday from 9 a.m. to 5 p.m. central standard time. You can call (312) 864-5526 or toll-free at (866) 967-7337.

Health Hazard Evaluations
The center assists local public health agencies in evaluating communities with environmental exposures that affect children's health.

Training
The center trains health care providers in children's environmental health through Medical Grand Rounds, seminars, and conferences. Web-based training for health care providers is available on our web site at http://publichealth.uic.edu/great-lakes/childrens-health

Research
Our faculty include clinical and public health scientists who conduct research on the most effective ways to diagnose, treat, and prevent children's environmental illnesses.

HOW TO CONTACT US

Toll free (within Region 5) in Illinois, Indiana, Wisconsin, Minnesota, Michigan and Ohio:
(866) 967-7337
Chicago area
(312) 864-5526
Cincinnati area
(513) 803-3688

Visit us on the web at:
http://publichealth.uic.edu/great-lakes/childrens-health

Tackling Childhood Lead Poisoning:

Community Organizing, Policy and Legislative Action

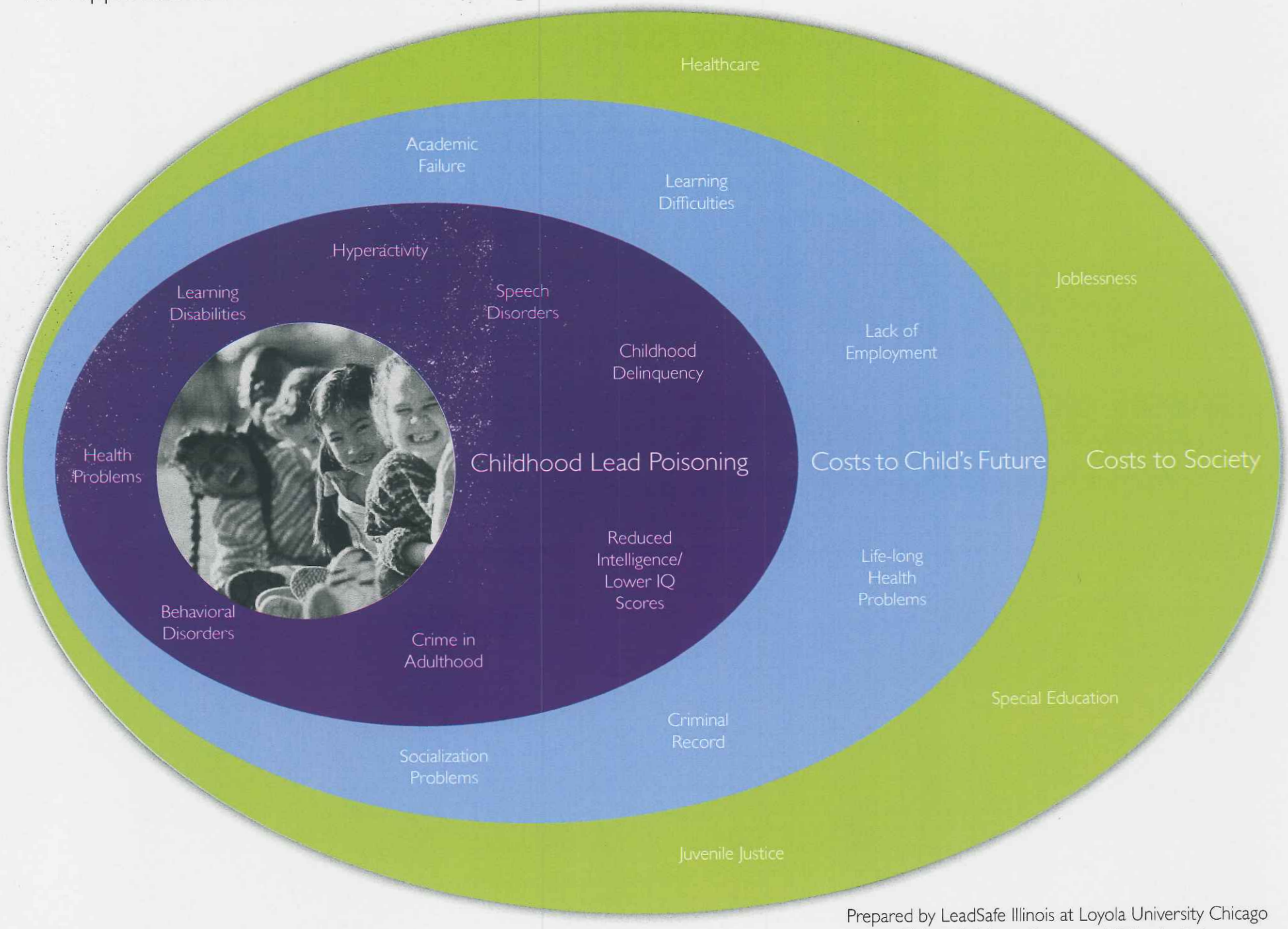
Illinois' Story

Lessons Learned

- Partnerships are key.
- Use a strength-based approach when working with community groups.
- Find the compelling message, make it simple, and convey it in different ways.
- Build trust.
- Compromise but cautiously.
- Know your goal but be flexible in the road to achieving it.

Anita Weinberg
Clinical Professor and Director, ChildLaw Policy Institute
Loyola University Chicago School of Law
25 E. Pearson, Chicago, Illinois 60611
312-015-6482
aweinbe@luc.edu

The Ripple Effects of Childhood Lead Poisoning



Prepared by LeadSafe Illinois at Loyola University Chicago
Civitas ChildLaw Center and Policy Institute

If you CURRENTLY have Medicaid, Healthy Michigan Plan or MIChild

If you did not get a notice about these additional services from the Michigan Department of Health and Human Services call the Beneficiary Help Line at:

1-800-642-3195

TTY 1-866-501-5656 for persons with hearing and speech disabilities.

Premiums, Contributions and Co-Pays

People who qualify for these additional services will not have to pay premiums, contributions or co-pays for their State of Michigan health care coverage.

Others in this group with incomes greater than 400 percent of the federal poverty can apply for Medicaid health coverage through a "buy-in" option to become available later this year.

For More Information and Help with Water Related Issues

The State of Michigan has a website to connect people with resources for Flint water related issues.

www.michigan.gov/flintwater

For More Information on Medicaid Services

Beneficiary Help Line
1-866-642-3195
TTY 1-866-501-5656

For More Information on Medicaid Enrollment

MI Bridges
www.michigan.gov/mibridges

Michigan Health Care Help Line
1-855-789-5610
TTY 1-866-501-5656

For questions and/or problems, or help to translate, call the Beneficiary Help Line at 1-800-642-3195 or TTY 1-866-501-5656.

Spanish: Si necesita ayuda para traducir o entender este texto, por favor llame al telefono, 1-800-642-3195 or TTY 1-866-501-5656

Arabic: TTY 1-866-501-5656

إذا كان لديكم أيّ سؤال، يرجى الإتصال بخط المساعدة على الرقم المجاني ١-٨٠٠-٦٤٢-٣١٩٥

MDHHS
Michigan Department of Health & Human Services
RICK SNYDER, GOVERNOR | NICK LYON, DIRECTOR

MDHHS is an Equal Opportunity Employer, Services and Program Provider
25,000 printed for $1988.88 or .079 Each.

Health Care Coverage for People Impacted by Flint Water

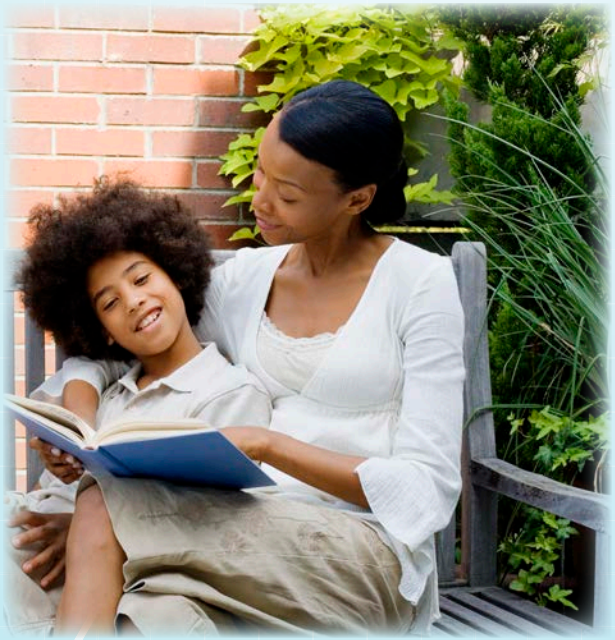
You and/or your child may be eligible for health care coverage

MDHHS
Michigan Department of Health & Human Services
RICK SNYDER, GOVERNOR | NICK LYON, DIRECTOR

You and/or your child may be eligible for health care coverage if you:

Were served by water from the Flint water system and lived, worked, or received childcare or education at an address that was served by the Flint water system at any time from April 2014 and a date to be determined in the future, and you and/or your child are:

- A pregnant woman
- Under age 21
- A child born to a woman who was served by the Flint water system during the specified time period



If you do not currently have Medicaid, Healthy Michigan Plan or MIChild

You can apply for coverage now if you have Income 400% or less of the federal poverty level

$47,520 for one person or $97,200 for a family of four

- The fastest way to apply is online at www.michigan.gov/mibridges

- You can also apply by calling the Michigan Health Care Help Line at 1-855-789-5610
  TTY 1-866-501-5656 for persons with hearing and speech disabilities.

Additional Services Available in Addition to Medicaid, Healthy Michigan Plan or MIChild

In addition to your medical benefits, you can get:

Targeted Case Management Services

Targeted case management (TCM) can connect you with medical, educational, social and/or other services you may need.

- A case manager will meet with you face-to-face to create a plan of care, and help you get needed services that are offered in your community including blood lead level testing and transportation to services you may need.
- **There is no cost to use these services.**

Health Care Coverage for People Impacted by Flint Water

You and/or your child may be eligible for health care coverage if you were served by the Flint water system and lived, worked, or received childcare or education at an address that was served by the Flint water system at any time from April 2014 and a date to be determined in the future, and you and/or your child are:

- A pregnant woman
- Under age 21
- A child born to a woman who was served by the Flint water system during the specified time period

Household Size	Yearly Income Max
1	$47,520
2	$64,080
3	$80,640
4	$97,200
5	$113,760
6	$130,320
7	$146,920
8	$163,560

MA Waiver Sites with Navigators to Assist Signing-Up

Carman-Ainsworth School District
Genesee Intermediate School District
Stalker Head Start
3329G Burnell Ave.
Flint MI 48507
Phone: 810-591-5144

Disability Network
3600 S. Dort Hwy., Suite 54
Flint, MI 48507
Phone: 810-244-3276

Shelter of Flint, Resource Center
605 N. Saginaw
Flint, MI 48505
Phone: 810-244-3276

Genesee Community Health Center
Center City
422 W. 4th Ave.
Flint, MI 48503
Phone: 810-496-5777

Genesee Health Plan
2171 S. Linden Rd.
Flint, MI 48532
Phone: 810-232-7740
Toll Free: 844-232-7740

Genesee Health System Access Center
420 W. Fifth Ave.
Flint, MI 48503
Phone: 810-496-5730

725 Mason St.
Flint, MI 48503
Phone: 810-496-5730

Genesee County DDA Health Dept.
630 S. Saginaw St., Suite #4
Flint, MI 48502
Phone: 810-257-3039

Hamilton Community Health Network
Administrative Offices
225 E. Fifth Street, Suite 300
Flint, MI 48502
Phone: 810-406-4246

Burton Clinic
G-3375 S. Saginaw St.
Flint, MI 48529
Phone: 810-406-4246

Clio Health Clinic
4154 W. Vienna Rd.
Clio, MI 48420
Phone: 810-406-4246

Dental North Clinic
5399 N. Saginaw St.
Flint, MI 48505
Phone: 810-406-4226

Lapeer Health Clinic
5170 Suncrest Dr.
Lapeer, MI 48446
Phone: 810-406-4246

Main Clinic
2900 N. Saginaw St.
Flint, MI 48505
Phone: 810-406-4246

North Pointe Clinic
5710 Clio Road
Flint, MI 48504
Phone: 810-406-4246

Hurley Medical Center
One Hurley Plaza
Flint, MI 48503
Phone: 810-262-9000

McLaren Flint
401 S. Ballenger Hwy.
Flint, MI 48532
Phone: 810-342-3707

Apply online at:

www.michigan.gov/mibridges

or call the Michigan Health Care Helpline at:

1-855-789-5610

(TTY 866-501-5656 for persons with hearing and speech disabilities)

For more information about Flint-related water issues, visit www.michigan.gov/flintwater.

Update: Flint Residents

Keeping Yourself and Your Family Healthy and Thriving

Fall, 2016

Learn about your family's health. Get help if you need it.

Lead exposure can harm children. Talk to a doctor about problems related to your child's:

- Health
- Education
- Development
- Behavior

There are services to help with these problems. Children under age 21 and pregnant women may be eligible for health care and other services. Apply online at www.mibridges.michigan.gov/access or by calling **1-855-789-5610**.

If you don't have a doctor, visit a health center. The health centers are open to everyone–both children and adults. For most people, they are free or very low cost.

Genesee Community Health Center: 810-496-5777.

- 422 W. 4th Avenue
- 3109 Kleinpell

Hamilton Community Health Network: 810-406-4246.

- 2900 N. Saginaw Street
- G-3375 S. Saginaw Street
- 5710 Clio Road

Manage Stress

If you are feeling stressed, talk to a trained crisis counselor from the Disaster Distress Helpline. All calls are free and confidential.

Call **1-800-985-5990**

Text **'TalkWithUs'** to **66746**

Deaf or Hard of Hearing: Call **1-800-846-8517**

Fight lead by eating healthy food!

Eating healthy food can help limit the amount of lead the body takes in. Eat foods that are high in Vitamin C, calcium, and iron.

Sources of Vitamin C include: Citrus fruit, like oranges and grapefruit; tomatoes and tomato juice; veggies such as peppers, broccoli, potatoes, brussels sprouts; and fruits like peaches, strawberries, pears, and watermelon.

Sources of calcium include: Milk and milk products, like cheese and yogurt; green leafy vegetables, such as spinach and collard greens; calcium-fortified orange juice; tofu; and canned salmon and sardines (both with the bones in).

Sources of iron include: Red meat, fish and chicken; green leafy vegetables, such as spinach and collard greens; whole-grain: cereal, bread and pasta; dried fruit; beans, peas and lentils.

You can get nutritious food from the food bank right in your own community. For a list of locations, visit www.michigan.gov/flintwater.

Genesee HEALTH SYSTEM

Hope and health in the community

Crisis number (877) 346-3648

Flint Water Family Supports FAQ

Flint Water Medicaid Expansion-Targeted Case Management

What is it?

Flint Water Family Supports is a no-cost Medicaid program to help families who have gone through the Flint Water Crisis.

A skilled and compassionate professional will visit you at your home to find ways to help you and your family be healthy.

Who qualifies?

Anyone who is covered under the Flint Water Medicaid Expansion.

What is the Flint Water Medicaid Expansion?

The Flint Water Medicaid Expansion is for individuals who were exposed to Flint water after April 2014, have income 400% or less of the federal poverty level, and are either:
under 21 or currently pregnant

*To sign up**:** see a Health Navigator, call 855-789-5610 (TTY 866-501-5656) or go to www.michigan.gov/mibridges

How does this help me?

A skilled professional will come to your home to help you and your children to use community services and resources such as:

- Medical Care and Lead Testing
- Educational Programs
- Mental Health Support
- Lead Risk Assessment

How do I sign up for Flint Water Family Supports?

Call Genesee Health System at 810-257-3777

Or, to have someone contact you, fill in the bottom section of this flyer and turn it in to GHS in person, at a resource fair, by fax: 810-257-3791, or by mail to Flint Water Family Supports, 420 W. 5th Avenue, Flint, MI 48503

Name: _____

Address: _____

Phone Number: _____

Best time to reach you: _____

SUMMER EBT for Children

2016 Benefit Months:

6/1/2016 - 6/30/2016

7/1/2016 - 7/31/2016

8/1/2016 - 9/5/2016

www.sebtc-mi.com

Each participating child may receive the following WIC approved foods per benefit month:

Low Fat Milk - 3 Gallons

Eggs - 1 Dozen

Cereal - 18 Ounces

Whole Grain Options - 1 lbs.

Peanut Butter & Bean Options

$8 Cash Value for Fresh Fruits & Vegetables

MDHHS Michigan Department of Health & Human Services

RICK SNYDER, GOVERNOR | NICK LYON, DIRECTOR

USDA and MDHHS are equal opportunity employers.

Congratulations!

On behalf of the Michigan Department of Health and Human Services and your Local School District, students in your household that qualify for free or reduced price school meals have been selected to participate in the Summer Electronic Benefit for Children program sponsored by the United States Department of Agriculture.

Your family will be eligible to receive $30 worth of healthy food (EBT Card) per eligible student per summer month. The EBT card can be used at WIC approved grocery stores or supermarkets.

Your EBT card and more information will be coming soon in the mail.

Information can also be found at www.sebtc-mi.com.

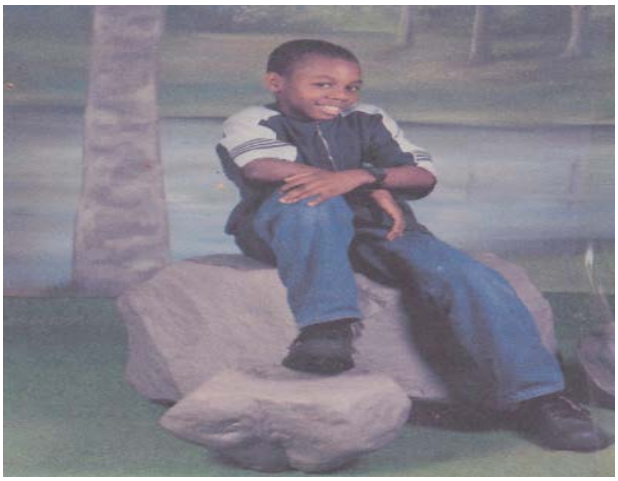
If there are any questions regarding the program please call 1-888-265-3291.

A Gray Paper
The Urgency and Importance of Eradicating Lead Poisoning

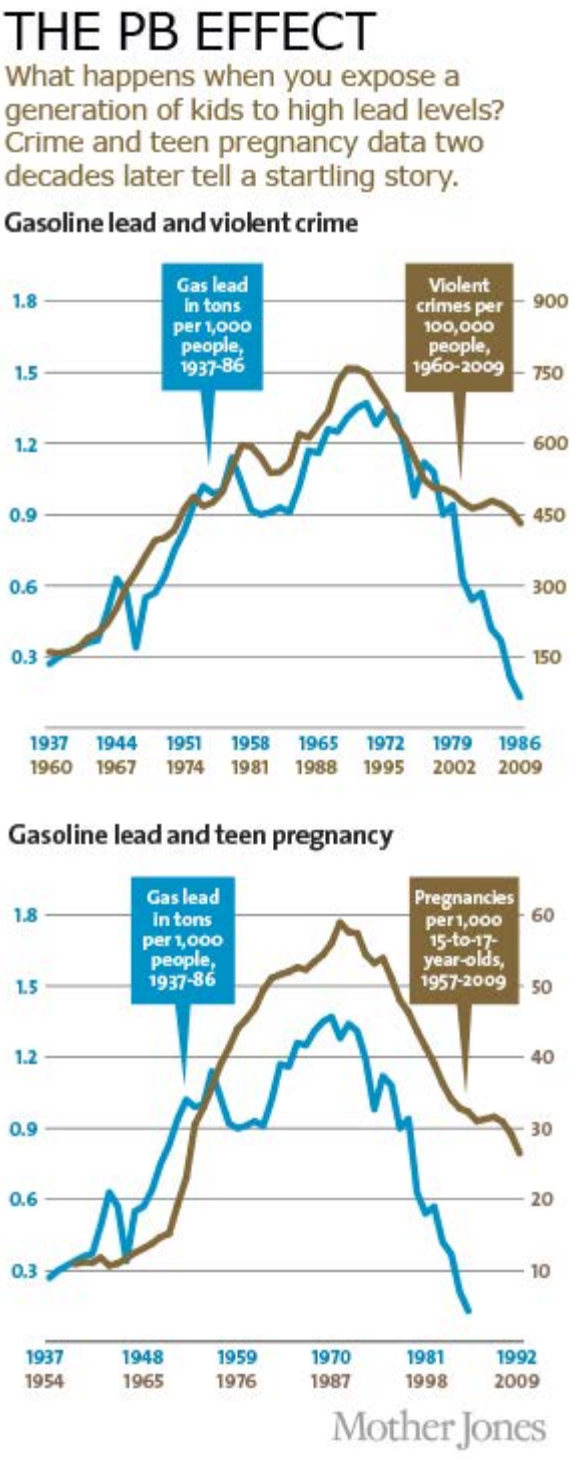
Queen Zakia Shabazz, Mother of a Lead Poisoned Son
Co-Founder United Parents Against Lead
Richmond, Virginia
November 2016

Introduction/Background

I could say a lot about my son, Zaki, and my family's 20 year bout with lead poisoning. Instead I choose to focus your attention on Sergio Gray. Sergio is a lead poisoned son also. He was poisoned in Norfolk, Virginia in 1991 and after many years of little or no treatment at the tender age of 18 he was sentenced to 40 years in prison. Lead poisoning has always been linked to Juvenile delinquency, criminal delinquency, violent crimes and impulsivity. Lead's grip on Sergio was no different. The year that Sergio was poisoned there were several other babies in the same apartment building that were also severely poisoned. One to the point of death. With over 9000 children poisoned in Flint, Michigan alone, what will the prison industrial system look like in 15 to 20 years from now? How many prisons are being planned and built now to house these stricken children? How many of them face the same fate as Sergio?



Sergio Gray - an innocent little boy with hopes and dreams
like any child his age, of a bright and promising future



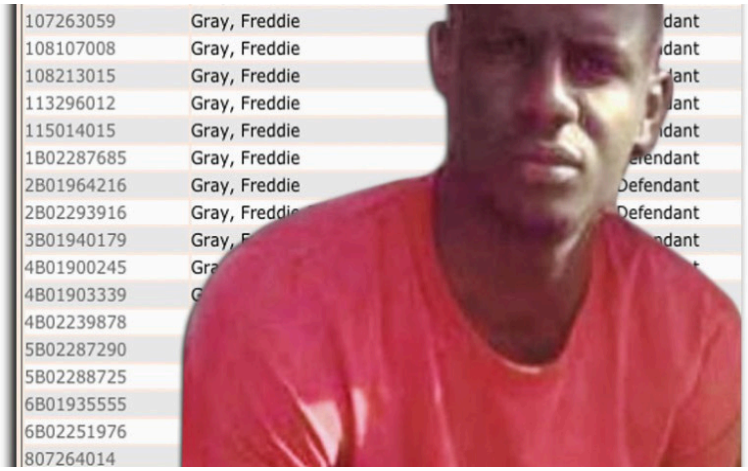
Top: Rick Nevin, USGS, DOJ;

Bottom: Rick Nevin, Guttmacher Institute, CDC

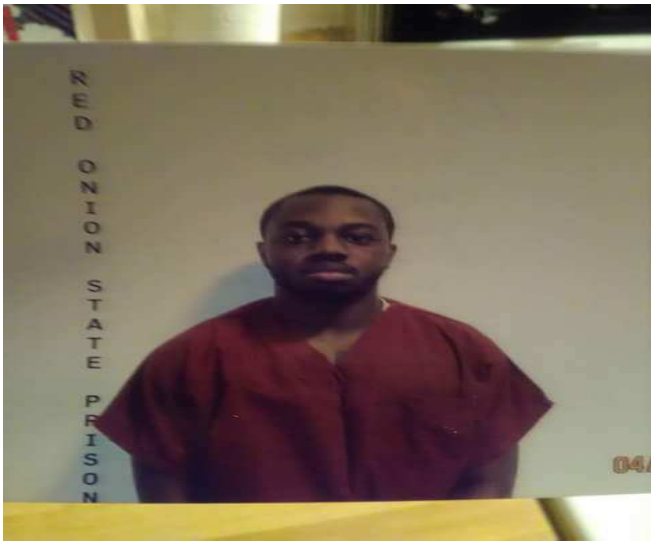
Sergio Gray : Freddie Gray

A Comparison

Both of African descent living in poor inner cities of America. Both with the family name Gray. Both victims of lead poisoning. Both born in 1989. Symbolically, both are dead. One buried. One languishing in a super max prison aptly named Red Onion. It's enough to make you cry.



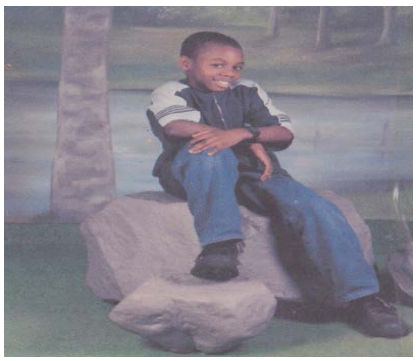
Freddie Gray buried in April 2015



Sergio Gray seven years into a 40 year prison sentence

Prevent Another Flint

As the mother of a lead poisoned son and representative of United Parents Against Lead (UPAL) I say that we must collectively do all that we can to protect children from the devastating and permanent effects of lead poisoning. Let us prevent another Flint. While we have seen the faces of some of the children of Flint Michigan today I share with you the faces of three UPAL children, victims of environmental racism and injustice in Virginia. What are we prepared to do for them?



Sergio – EBL 60 µg/dL
Poisoned in 1991 – Norfolk, VA
Sentenced to 40 years in prison

Zaki - EBL 30 µg/dL
Poisoned in 1994 – Richmond, VA
UPAL's Poster Child since 1996

Michael – EBL 89 µg/dL
Poisoned in 2015 – Petersburg, VA

UNITED PARENTS AGAINST LEAD (UPAL)
804.308.1518

WWW.UPAL.ORG ~ UPAL@JUNO.COM
A CHILD IS A TERRIBLE THING TO WASTE!

Eradication of Lead Poisoning in 5 Years – Yes We Can!

In order to prevent many other Sergio's we must comprehensively reduce exposure to lead from drinking water, paint, dust, soil and other potential sources of exposure. We know with certainty that high childhood lead exposure damages a part of the brain linked to aggression control and that the impact is greater among boys. We know that we must not continue to allow countless youth, teens, men and women be sentenced to life behind bars due to lead poisoning and their lack of control of the damage that it does to their brains. There has got to be a better way, an option to incarceration. Given that prison is a multi-billion dollar industry it is not in the jailer's best interest to find an alternative. But we as a conscious and able society can't continue to let our children languish behind bars and not get the medical attention and support they need and deserve. How many Flints have to happen and how many Sergios will have mothers crying and pleading for them before we get serious about keeping lead out of our children once and for all? We have the know-how. Let's just do it!

White Papers:

A Primer on Lead Poisoning Prevention in Housing, Water, Surveillance, Consumer Products & Other Sources, Funding, Jobs

Compiled by: David Jacobs, PhD, CIH, National Center for Healthy Housing

Reviewed by: Charlotte Brody, Mary Jean Brown, Julie Kruse, Manthan Shah, Tessa Walker Linderman, Queen Zakia Rafiqa Shabazz, Miriam Rotkin-Ellman, Deborah Nagin, Anita Weinberg, Mark Pokras, Wes Stewart, Michael Wilson[1]

Table of Contents

Summary

Lead is a metal that attacks many organ systems in the body, causing a host of behavior problems, reduced IQ, poor school performance and many other adverse health impacts. Millions of children will be exposed to lead at harmful concentrations in the coming years unless the remaining sources of exposure are addressed. Lead is present in many places, but the main sources of exposure are in housing (in the form of deteriorated lead-based paint, contaminated house dust and contaminated soil), drinking water (through lead pipes and plumbing), unnecessary uses in consumer products, and other sources detailed below. The knowledge to control these exposures is now well known and should be implemented across the nation to enable our children to grow up to reach their full potential. Currently, instead of eliminating these exposures, we only test some children's blood to see if they have been exposed; if they have been harmed, then sometimes remediation action is taken. This reactive approach is ineffective, causes needless suffering and is expensive. Indeed, the costs of lead exposure are on-going. Instead of simply continuing to absorb these costs (estimated to be in the billions of dollars each year), our nation should act to ensure our children are protected before they are harmed. We should act together to ensure that communities like Flint never have to suffer from lead poisoning ever again.

[1] Listing of Reviewers does not mean that they or their organizations necessarily support all recommendations listed here

Purpose

These papers were developed for two main purposes in support of the National Lead Summit in Washington DC on December 4-5, 2016:

- To provide basic information on aspects of the childhood lead poisoning problem.
- To provide suggestions for further deliberation and associated background information compiled from on-going initiatives, such as those shown below. A complete listing of recommendations is available from the groups shown below.
    - American Academy of Pediatrics
    - EarthJustice
    - Environmental Defense Fund
    - Find It Fund It Fix It Campaign (National Safe & Healthy Housing Coalition & National Center for Healthy Housing)
    - Green & Healthy Homes Initiative
    - Project TENDR

Introduction

Lead is one of the best extensively studied poisons, with over 25,000 studies and publications. The evidence is clear that lead causes a large number of health problem, particularly in young children. We also know that lead exposures occur through a large number of sources and pathways of exposure (Figure 1). Finally, we know how to eliminate such exposures to protect children and those methods are well-validated.

Perhaps the most recent review of lead toxicity is from EPA, [2] but others are also available.[3] [4] Lead is a metal with no useful biological function in the body, unlike other metals such as zinc or iron. Its principal adverse health effects in young children include:

- Mental and thought impairment, such as declines in cognition (as measured by Full Scale IQ, academic performance, and executive function);
- Attention, Impulsivity and Hyperactivity disorders, Conduct Disorders in Children and Young Adults (criminal offenses in young adults ages 19-24 years and higher parent and teacher ratings of behaviors related to conduct disorders in children ages 8-17 years);
- Behavior problems, as shown in higher parent and teacher ratings of depression or anxiety or other related problems such as withdrawn behavior in children ages 8-13 years;
- Reduced hearing;
- Reduced coordination and stability;
- Delayed pubertal onset;
- Lower birth weight and increased spontaneous abortion (miscarriages).
- Higher probability of asthma and allergy;

[2] EPA. Integrated Science Assessment for Lead. June 2013. EPA/600/R-10/075F

[3] National Toxicology Program Monograph on Health Effects of Low-level Lead (June 2012)

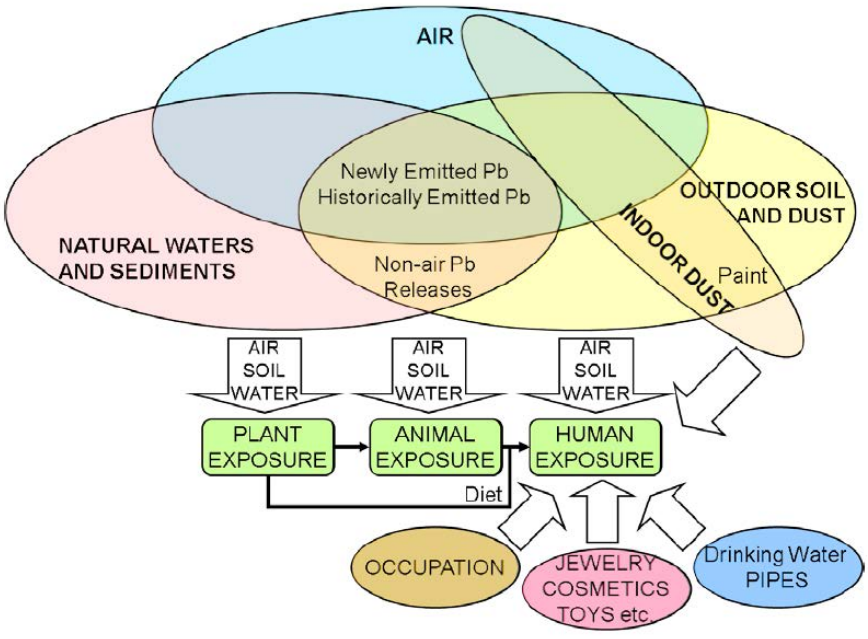
[4] Jacobs DE. Lead IN: Patty's Toxicology. (2012, July). Lead. In E. Bingham & B. Cohrssen (Eds.), Patty's Toxicology, 6th edition (pp. 381-426). New York: John Wiley and Sons. [ISBN: 978-0-470-41081-3].

- At higher exposures, death, coma, encephalopathy (brain dysfunction) and many other effect occur.
- Adults exposed to lead have reduced executive function (decision making skills), visual, learning and memory problems, depression and anxiety, reduced hearing, hypertension incidence and increased blood pressure, peripheral artery disease, coronary heart disease, reduced kidney function, decreased red blood cells, Altered Heme (blood forming) synthesis, and reduced function in both male and female reproductive systems.
- Lead is also known to cause cancer.[5]

See some of the references for more detailed descriptions of the many adverse health effects of lead exposure. Lead is present throughout the environment (Figure 1), but the main sources of exposure for most children today in the US are from deteriorating lead-based paint in houses, contaminated housedust, contaminated soil, drinking water, and unnecessary use in products, consumer goods, occupational exposures, home remedies and outdoor air.

The American Academy of Pediatrics states that there are no effective medical treatments for lead poisoning and that prevention of exposure is needed. [6]

Figure 1. Principal pathways of lead exposure (EPA)



[5] The International Agency for Research on Cancer has listed inorganic lead as a "probable" human carcinogen and the National Toxicology Program has listed it as "reasonably anticipated to be a human carcinogen."

[6] American Academy of Pediatrics, Council On Environmental Health. Prevention of Childhood Lead Toxicity. Pediatrics. 2016;138(1):e20161493

There are over 535,000 children with elevated blood lead levels in the United States.[7] Preventing childhood exposure to lead has a large return on investment; every dollar invested in lead hazard control results in health, educational, and other savings of at least $17-221,[8] a return slightly better than even vaccines. However, the Flint water crisis reminds us that investment in these interventions must not only be widespread but sustained, and that much more needs to be done to eliminate childhood lead poisoning. In the U.S., 37 million older homes contain lead paint, and 23 million of them have significant lead paint hazards.[9] An estimated 3.6 million of these homes currently house young children (whose brains are still developing); children of color and children of low-income households are disproportionately impacted by lead exposures in these homes. In addition, an estimated 6.1 million homes have lead service lines for their drinking water,[10] which is the most common reason for lead contamination in water.

The most recent data from the CDC's National Health and Nutrition Examination Survey shows that the average (i.e., geometric mean) blood lead levels among younger children, those belonging to poor families, and those enrolled in Medicaid were significantly higher compared with their older or more affluent counterparts. Furthermore, blood lead levels for non-Hispanic black children were significantly higher compared with either non-Hispanic white or Mexican American children.[11] (Figure 2). Blood lead levels are typically measured in micrograms of lead per tenth of a liter of blood and denoted as µg/dL. Recently, blood lead levels have also been denoted as parts per billion (5 µg/dL = 50 ppb).

[7] US Centers for Disease Control and Prevention. Blood Lead Levels in Children Aged 1–5 Years — United States, 1999–2010. W Wheeler and MJ Brown. Morbidity and Mortality Weekly Report, April 5, 2013, Vol. 62 , No. 13. 245-248

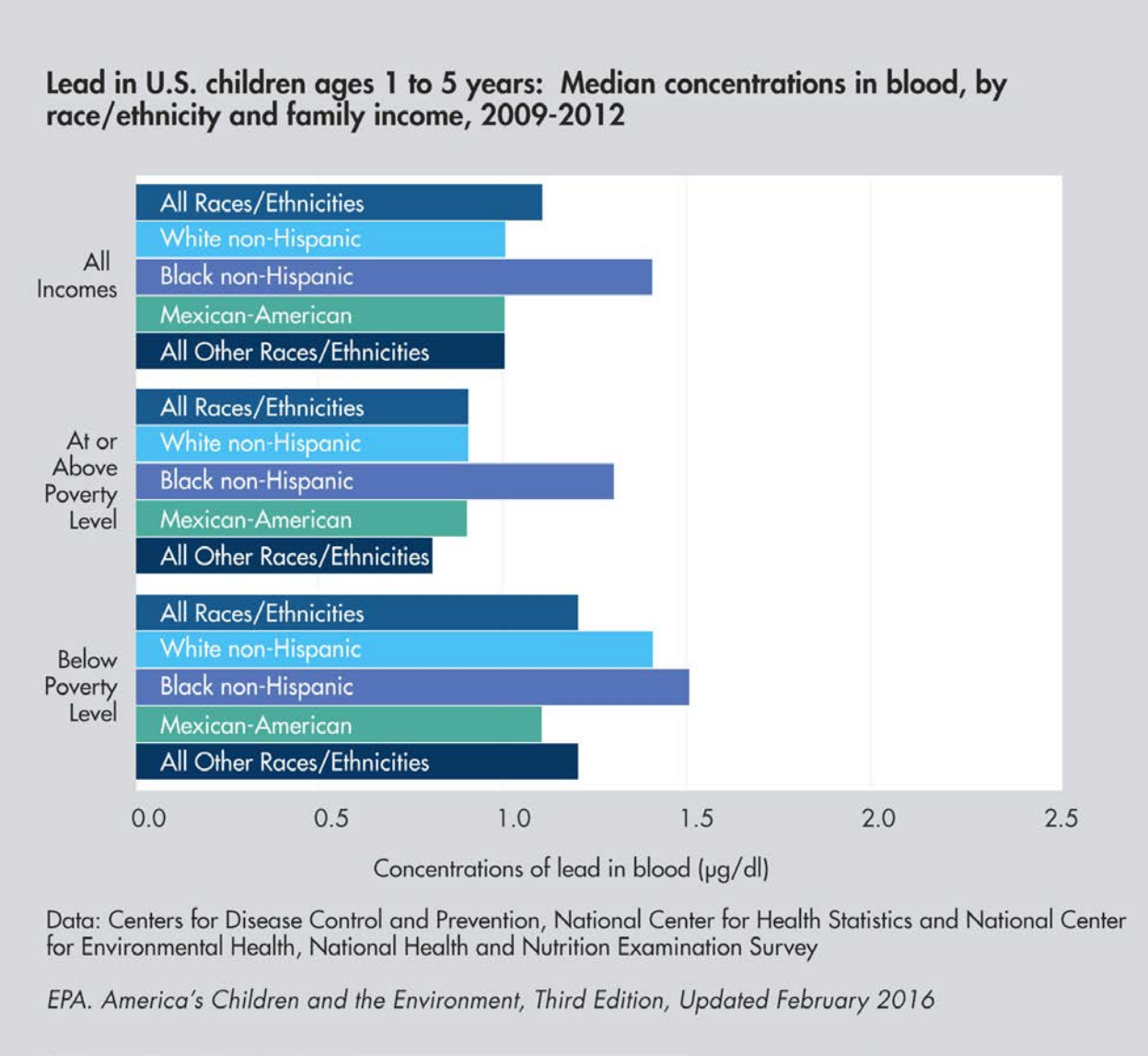
[8] Elise Gould, Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control. Environmental Health Perspectives. 117 (7) July 2009.

[9] U.S. Department of Housing and Urban Development. American Healthy Homes Survey Lead and Arsenic Findings. April 2011. Office of Healthy Homes and Lead Hazard Control

[10] David A. Cornwell, Richard A. Brown, And Steve H. Via National Survey Of Lead Service Line Occurrence Journal AWWA 2016 American Water Works Association APRIL 2016, 108:4

[11] Brown MJ and Wheeler. 2013. Blood Lead Levels in Children Aged 1–5 Years — United States, 1999–2010. Morbidity and Mortality Weekly Report, April 5, 2013, Vol. 62, No. 13, 245-248

Figure 2.



Because the rate of predominant health effects of lead on intelligence is highest at lower blood lead levels, the effect on IQ is dramatic (Figure 3).

Figure 3.

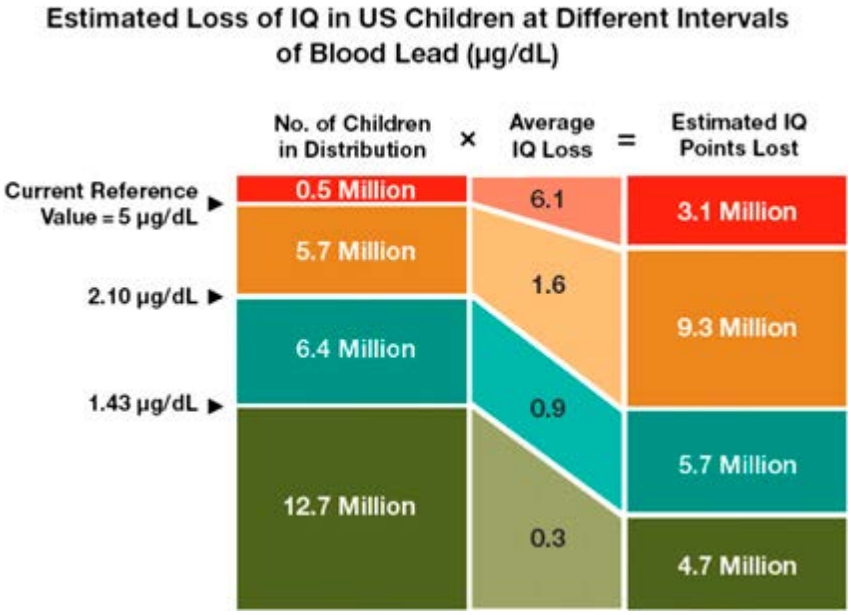


Figure 3 shows that the majority of IQ points lost due to lead exposure occur in children who have so-called "low to moderate" blood lead levels. Adapted from Bellinger.[12]

Many policies have been established to address lead exposures (Figure 4), and as a result lead exposures have declined over the decades. Yet exposures still remain widespread and average blood lead levels are a hundred times above "natural" background levels,[13] (Figure 5) meaning that there are many sources of exposure remaining that have not been adequately addressed. Failure to address these ongoing lead exposures will mean that millions of children in the coming years will be needlessly exposed to lead.

[12] Bellinger DC. A strategy for comparing the contributions of environmental chemicals and other risk factors to neurodevelopment of children. Environ Health Perspect. 2012;120(4):501–507

[13] Flegal AR, Smith DR. Lead levels in preindustrial humans. New Engi J MedL 1992;326:1293-1294.

Figure 4. Key policies to address lead exposures and mean blood lead levels, 1970-2016 (adapted from Brown MJ and Jacobs DE).

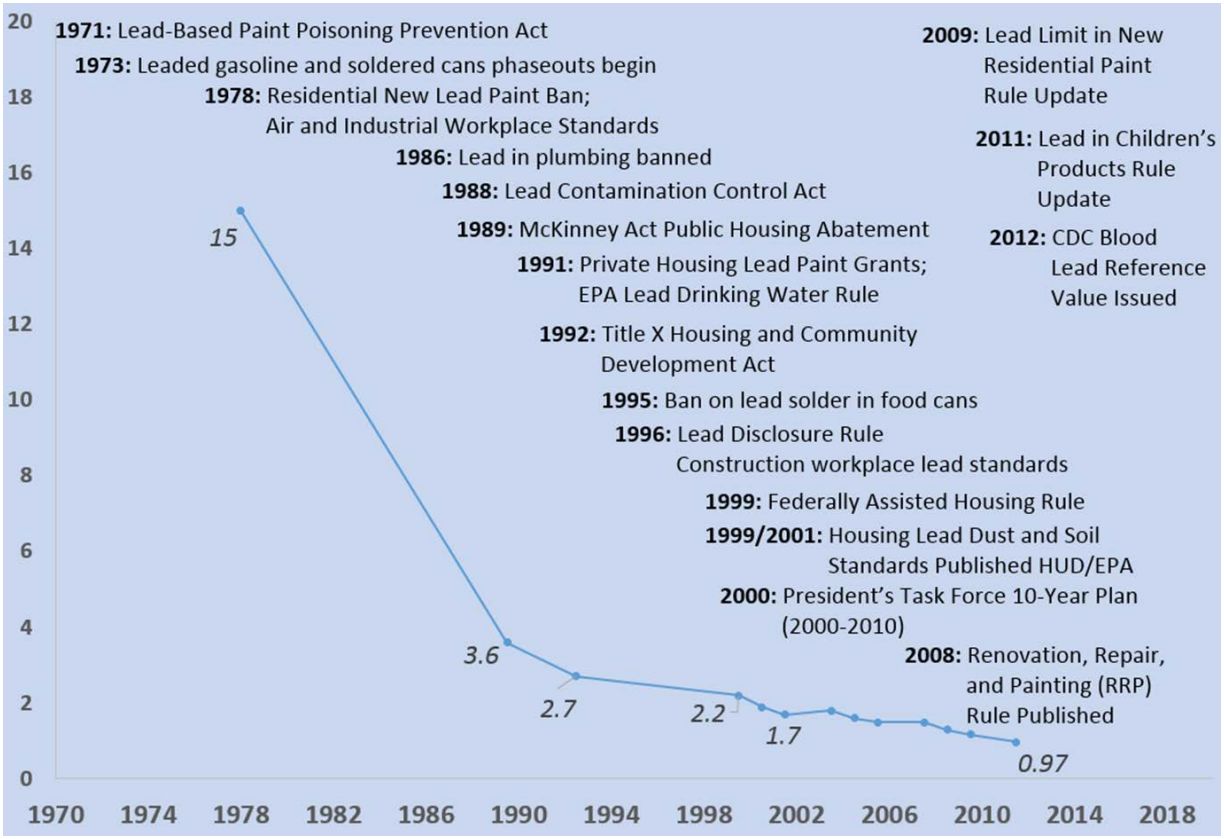
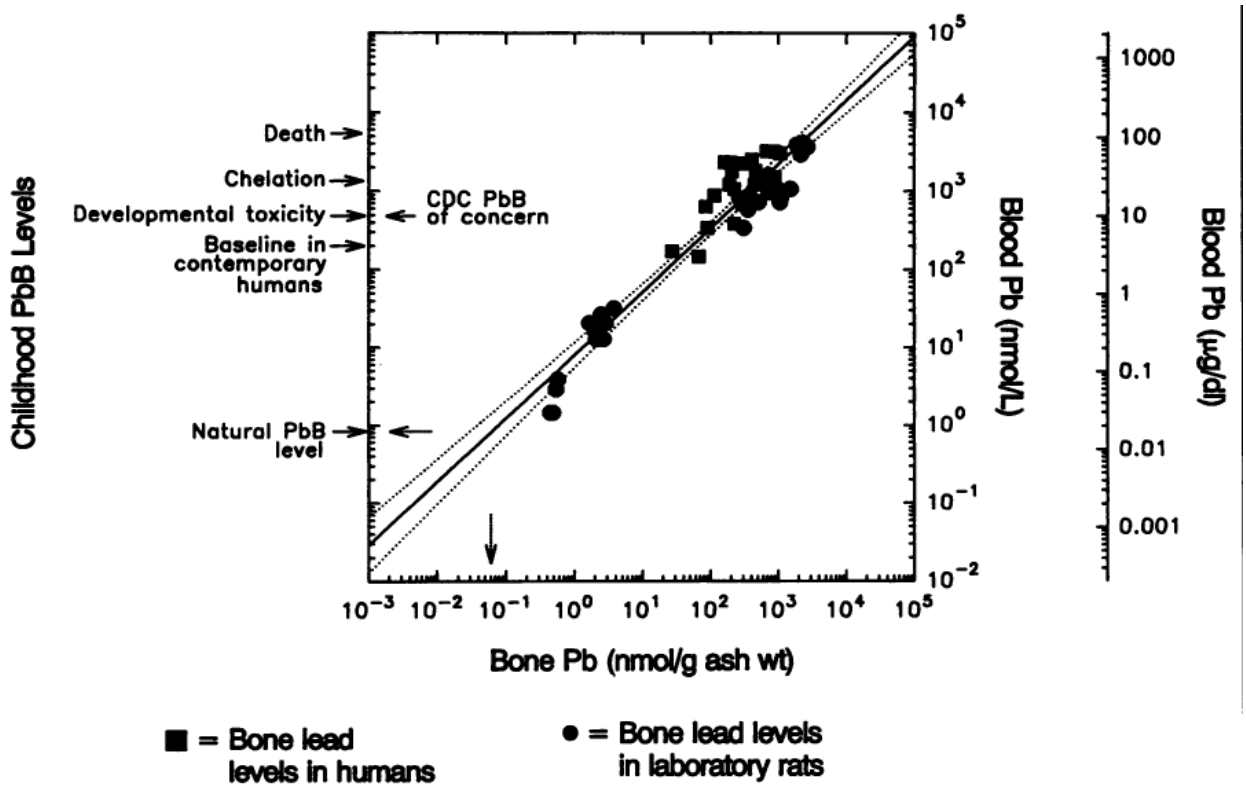


Figure 5. Modern blood lead levels are approximately 100 times above "natural" blood lead concentrations (from Flegal)[14].



Note. The natural lead concentration in blood of humans (0.8 nmol/L or 0.016 μg/dL, dashed arrow on the ordinate) was derived from the reported concentrations of lead in preindustrial human bone (dashed arrow on the abscissa) by graphical extrapolation of the relationship between paired bone- and blood-lead concentrations of humans (squares) and laboratory rats (circles). See Flegal and Smith[1] for details. The perspective on childhood PbB levels was adopted with modification from CDC.[2]

Lead also has dramatically damaging effects on a wide variety of non-human species. Clinical lead poisoning is frequently seen in pets,[15] [16] farm animals,[17] wild birds (including the bald eagle),[18] fish[19] and other species. Chronic, sublethal lead toxicosis is documented but less well

[14] Flegal AR, Smith DR. Lead levels in preindustrial humans. New Engi J MedL 1992;326:1293-1294.

[15] Morgan RV, Moore FM, Pearce LK, and T. Rossi. 1991. Clinical and laboratory findings in small companion animals with lead poisoning: 347 cases (1977-1986).J Am Vet Med Assoc. 199(1): 93-7.

[16] Puschner B and RH Poppenga RH. 2009. Lead and zinc intoxication in companion birds. Compend Contin Educ Vet. 31(1): E1-12

[17] Buchweitz, J, McClure-Brinton, J, Zyskowski, J, Stensen, L, and A Lehner. 2015. Lead isotope profiling in dairy calves. Regulatory Toxicology and Pharmacology. 71: 174–177.

[18] Cruz-Martinez L, Redig PT, and J Deen. 2012. Lead from spent ammunition: a source of exposure and poisoning in bald eagles. Hum Wildl Interact 6(1): 94–104.

[19] Schmitt CJ, Whyte JJ, Brumbaugh WG, and DE Tillitt. 2005. Biochemical effects of lead, zinc, and cadmium from mining on fish in the Tri-States District of northeastern Oklahoma, USA. Environ Toxicol Chem. 24(6): 1483-1495.

studied in nonhuman species. Lead can also have significant effects on ecosystems.[20] [21] As with humans, the lead that poisons animals comes from many sources. Exposure from lead paint and lead in water are common, but lead contamination from mining, smelting, manufacturing, disposal and recycling also poisons large numbers of animals. A major source of lead for animals (and humans) includes lead bullets, shotgun pellets, and fishing weights. Production of such lead-based sporting goods in the United States is second only to the amount of lead used to manufacture storage batteries.[22] To protect the health of people and other species it is incumbent that all of us think ecologically and understand all sources of exposure to this toxic metal. Interdisciplinary collaborations among human health experts, veterinarians, wildlife professionals and others is needed.

Lead Poisoning Prevention Plans

Over the years, plans to address childhood lead poisoning have been published by various agencies and others. The most recent was published in 2000 by the President's Task Force on Environmental Health Risks and Safety Risks to Children, with a 10-year plan and an interagency budget.[23] Its goal was not achieved in 2010, due largely to inadequate funding and the plan has not been updated since then.

A listing of programs for the Consumer Product Safety Commission, (CPSC), the Department of Agriculture (USDA), the Department of Education (ED), the Department of Health & Human Services (HHS), the Department of Housing and Urban Development (HUD), the Department of Justice (DOJ), the Department of Labor (DOL), the Department of Transportation (DOT), and the EPA has recently been published.[24]

In general, these programs have been inadequately funded to achieve the goal of eliminating lead poisoning and in fact funding for these programs has been reduced in recent years (Figure 6). For example, funding for CDC was reduced from about $35 million in 2011 to only $2 million in 2012 and has only been partially restored to about $15 million since then. HUD's lead hazard control program has been reduced from $176 million in 2003 to only $110 million in 2016. This means that fewer local jurisdictions have less funding to address lead hazards; private and philanthropic investments in lead poisoning have also been inadequate.

[20] Friend, M. 2012. Lead (Chap. 43). In: Franson,JC, and M Friend (eds). Field manual of wildlife diseases. U.S. Geological Survey. pp: 317-334. http://www.nwhc.usgs.gov/publications/field_manual/chapter_43.pdf

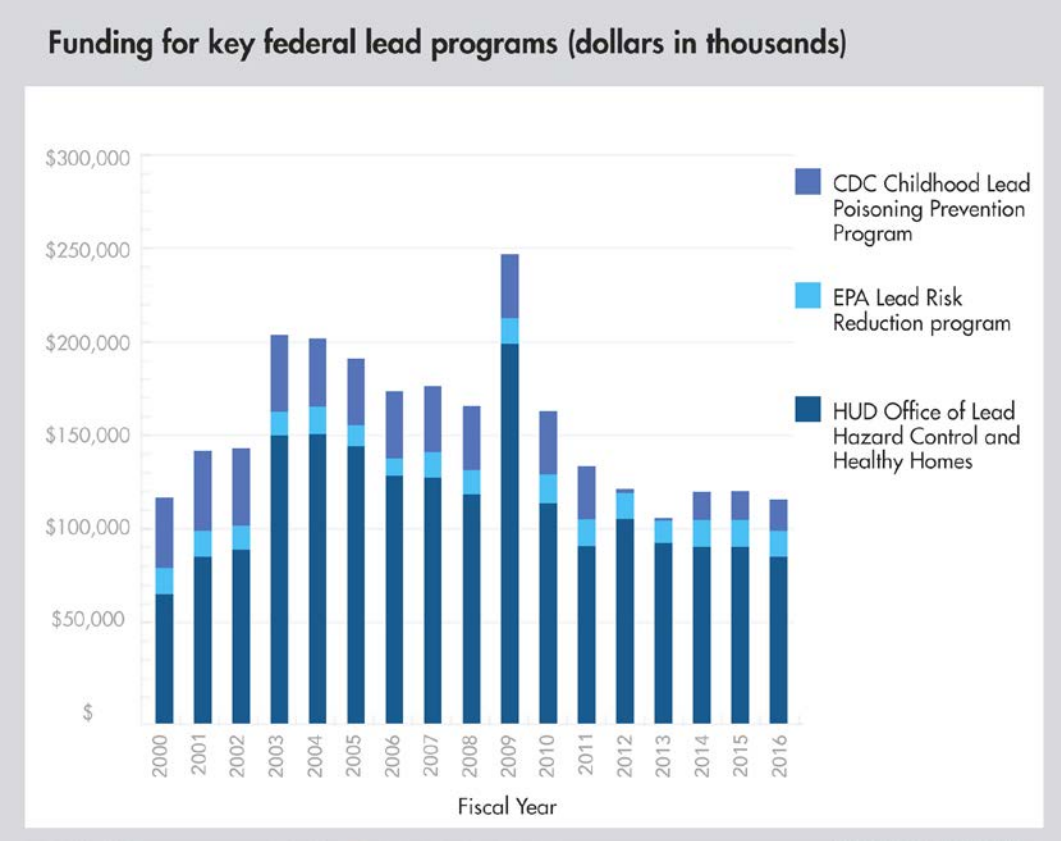
[21] Pokras, MA and MR Kneeland. 2008. Lead poisoning: using transdisciplinary approaches to solve an ancient problem. EcoHealth 5(3): 379-385.

[22] U.S. Geological Survey. 2013. Mineral Industry Surveys: Lead in January 2013. Available: http://minerals.usgs.gov/minerals/pubs/commodity/lead/mis-201301-lead.pdf [accessed 9 May 2013].

[23] President's Task Force on Children's Environmental Health Risks and Safety Risks (J. (2000, March). Eliminating childhood lead poisoning: A federal strategy. Washington, DC:

[24] Key Federal Programs to Reduce Childhood Lead Exposures and Eliminate Associated Health Impacts. President's Task Force on Environmental Health Risks and Safety Risks to Children. November 2016. https://ptfceh.niehs.nih.gov/features/assets/files/key_federal_programs_to_reduce_childhood_lead_exposures_and_eliminate_associated_health_impactspresidents_508.pdf

Figure 6.


Funding for key federal lead programs (dollars in thousands)
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$
2000
2001
2002
2003
2004
2005
2006
2007
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2009
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2011
2012
2013
2014
2015
2016
Fiscal Year
CDC Childhood Lead Poisoning Prevention Program
EPA Lead Risk Reduction program
HUD Office of Lead Hazard Control and Healthy Homes

Paper 1: Housing

One of the most dangerous and widespread types of lead contamination afflicting children is residential lead paint and the contaminated dust and soil it generates. Lead contaminated plumbing and service lines are also widespread (see Paper 2). The association between lead paint and blood lead has been extensively reviewed[25] and the National Academy of Sciences stated, "Lead-based paint is the largest source of high-dose lead exposure for children."[26] Unlike earlier sources of lead exposure such as gasoline, food canning and industrial emissions that can all be controlled by eliminating its use in central refineries and factories, residential lead paint is widely dispersed (but highly concentrated on some surfaces) in homes throughout the nation, making finding and eliminating dangerous exposures difficult. General practice historically has been to wait until a child is found to have been exposed to lead in order to find and eliminate the source of lead in the home.

According to the most recent American Healthy Housing Survey[27] conducted in 2006, there are 37 million older homes (about a third of the nation's housing stock) with lead paint, 23 million of which have significant lead paint hazards (meaning levels of lead in deteriorated paint, dust or soil that are above current EPA/HUD limits). Of the homes with hazards, 3.6 million of them currently have young children, and 1.1 million are in low income housing, where risks are greatest. Yet even in older housing, most paint is in fact not leaded. Lead paint tends to be concentrated on windows, doors and trim, although in any individual home its location and concentration can vary considerably. The federal government defines a "lead-based paint hazard" as deteriorated lead paint, contaminated dust and contaminated soil, regardless of source.[28]

In general, there are two methods of identifying lead paint problems and two means of eliminating them.[29] The presence of lead paint in a home is determined by a lead-based paint inspection that measures lead paint on most surfaces with a common painting history. The second method is to conduct a lead paint risk assessment, which measures lead in deteriorated paint, dust and soil. The two methods can be combined.

There are also two broad methods of remediating lead paint problems—long term "abatement" and shorter term "interim controls." These two methods can also be combined. The identification step informs the remediation step, so effectiveness of identification and remediation cannot be separated, as discussed later. Abatement and interim controls are not the same as renovation, remodeling and repainting. These latter activities typically occur without dust control or post-cleanup dust testing,

[25] Jacobs DE. Lead-Based Paint as a Major Source of Childhood Lead Poisoning: A Review of the Evidence in Lead In Paint, Soil and Dust: Health Risks, Exposure Studies, Control Measures and Quality Assurance, Michael E. Beard and S.D. Allen Iske, Eds, American Society for Testing and Materials, Philadelphia, p. 175-187, 1995.

[26] Measuring Lead Exposure in Infants, Children, and Other Sensitive Populations Committee On Measuring Lead In Critical Populations, Board On Environmental Studies And Toxicology, Commission On Life Sciences, National Academy Press, Washington, D.C. 1993

[27] HUD. (2011). American Healthy Homes Survey Lead and Arsenic Findings. http://portal.hud.gov/hudportal/documents/huddoc?id=AHHS_Report.pdf

[28] 24 CFR Part 35, definitions

[29] Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing. 2012. US Department of Housing and Urban Development. http://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes/lbp/hudguidelines

resulting in significant exposures to children. Some forms of renovation and remodeling and repainting may also employ paint removal methods that are not allowed for abatement or interim controls, such as burning or torching lead paint, abrasive blasting and unlimited dry scraping. If scraping occurs as part of abatement or interim controls, it is done using wet methods to control dust (with the exception of scraping near electrical circuits, where wet methods could cause electrocution).

The remainder of this housing paper contains some ideas for further deliberation.

Expand abatement resources by increasing funding for HUD's lead hazard control program (which is focused on low-income housing) and by providing tax credits and other financial incentives for market rate housing. To address lead hazards in low income units occupied by children, HUD's lead grant program should be funded at $2.5 billion annually for 5 years as part of the nation's effort to rebuild infrastructure. This will provide tens of thousands of jobs and improve property value. **Advantages:** abatement treatments are more durable compared to interim controls and require either no on-going monitoring if all lead paint is removed, or less if some is still present behind permanent treatments**. Disadvantages:** This has the disadvantages of initially costing more and requires specialized workers.

Evidence for abatement effectiveness can be gleaned from several studies: The largest is the Evaluation of the HUD Lead Hazard Control Grant program,[30] a study covering over 3,000 housing units in 14 jurisdictions. Blood lead levels declined 37% two years after treatment. But because blood lead levels are affected by all sources of exposure, dust lead levels are likely to be a better metric of abatement effectiveness because they are less confounded by other sources of lead. Blood lead and dust lead are well correlated with each other in numerous studies.[31] [32] (Blood lead is measured in micrograms of lead per tenth of a liter of blood (μg/dL) or in parts per billion; Dust lead is measured by wipe sampling and expressed as micrograms of lead per square foot of surface area wiped (μg/ft^2). Three years after intervention average (geometric mean) dust lead loadings on floors, window sills and window troughs were 9, 62 and 363 μg/ft^2, respectively (declines of 78%, 89%, and 95%, respectively compared to pre-intervention levels). These substantial declines were observed across all 14 jurisdictions in the study. The study also found that after controlling for other factors, full interior lead abatement was associated with the largest relative reductions in floor dust lead loadings over a year.

Another smaller scale study comparing interim controls and abatement[33] showed that immediately after intervention (intervention means lead hazard control) and at two years later,

[30] NCHH and University of Cincinnati. Dept. Environmental Health. (2004). Evaluation of the HUD Lead-Based Paint Hazard Control Grant Program Final Report

[31] Lanphear, B. P., Matte, T. D., Rogers, J., Clickner, R. P., Dietz, B., Bornschein, R. L., Succop, P., Mahaffey, K. R., Dixon, S., Galke, W., Rabinowitz, M., Farfel, M., Rohde, C., Schwartz, J., Ashley, P.J., & Jacobs, D. E. (1998, October). The contribution of lead-contaminated house dust and residential soil to children's blood lead levels: A pooled analysis of 12 epidemiologic studies. Environmental Research, 79(1), 51-68.

[32] Lanphear BP, Emond E, Weitzman M, Jacobs DE, Tanner M, Winter N, Yakir B, Eberly S. A Side-By-Side Comparison of Dust Collection Methods for Sampling Lead-Contaminated House Dust, Environ Res 68, 114-123, 1995.

[33] Farfel et al. 2000. An Extended Study of Interim Lead Hazard Reduction Measures Employed In The Baltimore

geometric mean dust lead loadings on floors and window sills in "Major Repair" houses (similar to abatement) were reduced from 415 to 49 µg/ft^2 on floors, from 462 to 15 µg/ft^2 on window sills and from nearly 58,000 µg/ft^2 to 257 µg/ft^2 for window troughs. Homes that received only minor repairs or cleaning had much smaller reductions in dust lead levels.

Another smaller scale study[34] compared three types of intervention and compared them to homes in two comparison groups. One type (which is similar to abatement) had median dust lead levels that declined from 51,210 µg/ft^2 before treatment to 120 µg/ft^2 two years later (note: this study used vacuum sampling not wipe sampling to measure lead dust and therefore cannot be compared to clearance dust standards). The interim control option had median dust lead levels that declined from 16,150 µg/ft^2 before treatment to 3,320 µg/ft^2 two years later. This two-year level was higher than abatement. This study also measured blood lead and showed the same trend as dust lead. The interim control option showed children's blood lead level declined from 17.9 µg/dL to 10.3 µg/dL two years later (a difference of 7.6 µg/dL). But the abatement option showed children's blood lead level declined more (from 21.7 µg/dL before treatment to 12.6 µg/dL two years later, a difference of 9.1 µg/dL). Not surprisingly, trends in blood lead are influenced by many variables, including baseline (before treatment) blood lead level, other sources, season, endogenous bone lead levels and others. An EPA review[35] generally showed similar results across older studies, i.e., that more intensive treatments such as abatement were associated with greater declines in both blood and dust lead levels compared to less intensive treatments such as interim controls and that both interventions were beneficial.

Of course, not all children will necessarily see reductions in their blood lead levels following abatement, because children have other exposures outside of their home and because lead is not easily excreted from the body once absorbed. The findings from the HUD Evaluation study indicated an overall average (geometric mean) reduction of 37% in the blood lead levels 2 years after the implementation of lead hazard controls. However, 9.3% of these children had blood lead increases of 5 ug/dL or more. In other words, 91% of the children had either reductions in blood lead or no change. This is not really surprising because blood lead levels integrate all sources of exposure and a few children can be expected to have some increases probably due to sources of exposure other than their primary home that had been remediated. In short, it is not realistic to expect that all children living in abated homes will have blood lead decreases due to the influence of other sources (including lead already stored in their bones). The study showed 4 factors significantly related to the relatively few children who had significant increases in blood lead: (i) Child's age at pre-intervention. (ii) Female caregiver's education. (iii) General exterior

Clinical Center of The Treatment Of Lead- Exposed Children (TLC)-Clinical Trial. April 2000. Prepared for US Department of Housing and Urban Development

[34] Farfel et al. 1997. Lead Based Paint Abatement and Repair and Maintenance Study. Environmental Protection Agency. EPA-747-R-97-005

[35] Review Of Studies Addressing Lead Abatement Effectiveness: Updated Edition, EPA 747-B-98-001, December 1998, Technical Programs Branch, Chemical Management Division Office of Pollution Prevention and Toxics, U.S. Environmental Protection Agency

building condition. (iv) Season of blood lead sample collection.[36] [37] It should also be noted that the post-intervention lead dust standards in place at the time of this study were considerably higher than today's standards (100 µg/ft^2 compared to today's standard of 40 µg/ft^2 for floors).

<u>Create incentives</u> to eliminate original lead-contaminated single pane windows. Congress should support energy efficient, lead-free window replacement through tax credits and subsidies. The Department of Energy, HHS and HUD and other allied programs should all expand lead-free Energy Star window replacement in light of the health and energy benefits. Windows have the highest lead paint and lead dust levels compared to all other building components.[38] Replacing windows in older housing will greatly reduce and often eliminate lead hazards. Replacing windows creates new jobs, conserves energy, increases home value, creates aesthetic appeal and eliminates a major contributor to children's lead exposure**. Advantages**: More durable, targeted to highest risk source, less on-going monitoring, integrated with weatherization/energy work, market value improvement, job creation. **Disadvantages:** Windows are costly and replacement may take longer.

There are two principal studies of window replacement: one is a 12-year follow-up in 4 cities in the HUD Evaluation study and the second is a recently completed study in Illinois. Both studies show large, sustained reduction in dust lead levels associated with window replacement. The most recent study[39] shows that one year after window replacement, average (geometric mean) lead dust for interior floors, interior window sills, and exterior window troughs declined by 44%, 88%, and 98%, respectively ($P < .001$). Geometric mean dust lead levels for floors declined from 7.5 µg/ft^2 at baseline to 4.1 µg/ft^2 one year later; for window sills the decline was greater, from 144 µg/ft^2 at baseline to 17 µg/ft^2 one year later; and for window troughs the decline was greater still, from 2,737 µg/ft^2 at baseline to 46 µg/ft^2 one year later.

The second study,[40] which is also the nation's longest term follow-up study of lead hazard control, examined the relative difference in dust lead levels in homes in the HUD lead grant program that had none, some, and all windows replaced. Twelve years after intervention, homes with all replacement windows had 41% lower interior floor dust lead, compared to non-replacement homes (1.4 versus 2.4 µg/ft^2) and window sill dust lead was 51% lower (25 versus 52 µg/ft^2) while controlling for covariates. Homes with only some windows replaced had interior floor and window sill dust lead loadings that were 28% (1.7 versus 2.4 µg/ft^2) and 37% (33 versus 52 µg/ft^2) lower, respectively, compared to non-replacement homes. The net

[36] Clark, S., Grote, J., Wilson, J., Succop, P., Chen, M., Galke, W., & McLaine, P. (2004). Occurrence and determinants of increases in blood lead levels in children shortly after lead hazard control activities. Environmental Research. 96(20; 196-205.

[37] Clark CS, Galke W, Succop P, Grote J, McLaine P, Wilson J, Dixon S, Menrath W, Roda S, Chen M, Bornschein R, DE Jacobs. 2011. Effects of HUD-Supported Lead Hazard Control Interventions in Housing on Children's Blood Lead, Environ Res 111: 301-311.

[38] Jacobs DE, Clickner RL, Zhou JL, Viet SM, Marker DA, Rogers JW, Zeldin DC, Broene P and W. Friedman. The Prevalence of Lead-Based Paint Hazards in U.S. Housing, Environ Health Perspect 110:A599-A606, Sept 13, 2002.

[39] David E. Jacobs, Matthew Tobin, Loreen Targos, Dale Clarkson, Sherry L. Dixon, Jill Breysse, Preethi Pratap, Salvatore Cali. Replacing Windows Reduces Childhood Lead Exposure: Results from a State-Funded Program, J Public Health Management & Practice 2016 Sep-Oct;22(5):482-91

[40] Dixon S, Jacobs DE, Wilson J, Akoto J, Clark CS. 2012. Window Replacement and Residential Lead Paint Hazard Control 12 Years Later. Environ Res 113: 14-20.

economic benefit of window replacement compared to window repair (non-replacement) is $1700–$2000 per housing unit.

Importantly, both these studies showed large declines in dust lead levels, not only on windows as expected, but also on floors, which children are likely to contact more frequently.

If Hazards or a Poisoned Child Are Identified, Remediation Should Be Done Before Another Child Is Exposed by prohibiting the lease or sale of a home with hazards until the hazards are remediated. Congress, states and local jurisdictions could require that if a poisoned child is identified in a multi-family housing development, then all the units in the development should be tested, because it is likely other children are also at risk. Frequently, when a child is poisoned in a particular house, the family is moved to another home without the first home being fixed. The result is often another poisoned child in that first home. Once hazards are identified, they need to be fixed, even if the child leaves. In multifamily housing, a frequent practice is to test only one apartment, not the others that likely also have problems due to common maintenance practices. **The advantages** of this recommendation are that it is highly targeted, risk assessments may already be completed, it focuses attention on the worst cases, and stimulates private sector investment. **The disadvantages** include the fact that one bad unit may not represent an entire multifamily housing development.

The principal evidence is from two studies. One is a study[41] comparing 682 residential addresses, identified between 2000 and 2009, in two states with and one state without laws to prevent childhood lead poisoning among children younger than 72 months, to determine whether the laws were effective in preventing subsequent cases of lead poisoning detected in residential addresses after the identification of an index case. The two states with lead laws, Massachusetts and Ohio, were 79% less likely than the one without legislation (Mississippi) to have residential addresses with subsequent lead poisoning cases among children younger than 72 months.

The second study[42] linked 1997-2003 Chicago elevated blood lead surveillance, environmental inspection, and building footprint data. The authors found that 49,362 children younger than 6 years with elevated blood lead levels (BLLs) lived at 30,742 buildings. Of those, 67 were "high-risk" buildings and these were associated with 994 children with elevated BLLs. On average, 15 children with elevated BLLs had lived in each building (range: 10-53, median: 13). Almost two thirds (n = 43) of the high-risk buildings had two or more referrals for inspection to the same apartment or housing unit; of those, 40 percent (n = 17) failed to maintain lead-safe status after compliance. Another study found that strict enforcement of lead poisoning prevention housing policies saved money through reduced medical and education costs related to lead poisoning.[43]

[41] Kennedy C1, Lordo R, Sucosky MS, Boehm R, Brown MJ Primary prevention of lead poisoning in children: a cross-sectional study to evaluate state specific lead-based paint risk reduction laws in preventing lead poisoning in children. Environ Health. 2014 Nov 7;13:93. doi: 10.1186/1476-069X-13-93.

[42] Reyes NL1, Wong LY, MacRoy PM, Curtis G, Meyer PA, Evens A, Brown MJ. Identifying housing that poisons: a critical step in eliminating childhood lead poisoning. J Public Health Manag Pract. 2006 Nov-Dec;12(6):563-9.

[43] Brown MJ. (2002). Costs and benefits of enforcing housing policies to prevent childhood lead poisoning. Med Decis Making. 2002 Nov-Dec;22(6):482-92.

Trust But Verify By Increasing Enforcement of Existing Lead Poisoning Prevention Laws and Regulations. HUD and EPA should increase enforcement staffing levels, and Congress should appropriate funds necessary for adequate enforcement. There is little enforcement of existing lead poisoning prevention laws due to inadequate staffing or prioritization of lead at federal, state and local agencies. For example, in FY15, EPA did so few inspections under its lead Renovation, Repair, and Painting Program, that a busy contractor doing five jobs a week would encounter an EPA official on average once every 57 years. But enforcement of the lead disclosure rule has resulted in over 188,000 units getting lead hazards remediated. **Advantages:** Highly targeted, could stimulate private sector investment to make homes safe or be penalized**. Disadvantages**: Existing rules may not be adequate and cases can take a long time.

Proper enforcement is known to have substantial benefits. One study[44] conducted decision analysis using population-based data that compared recurrence of childhood lead exposure in 2 urban areas with different enforcement capacity, and cost data from a federal project and from medical and public health literature. Strict enforcement prevented additional cases, resulting in $45,360 savings from decreased medical and education costs and increased productivity for protected children. The model was robust to changing estimates of follow-up, housing repairs, relocation, and increases in lead levels over baseline.

Make Disclosure Meaningful: The current law on lead paint disclosure[45] does not require testing of lead paint, dust, soil and water and the determination of the presence or absence of a lead service line at the time of sale or lease so that remediation can be financed through mortgages or other financial means. The nation's current law on disclosing lead problems in housing does not require determining if lead is actually present.[46] Instead, the law only requires disclosure of already "known" lead hazards, that is, the results of tests previously conducted. Because most homes have not yet been inspected in the US, there is usually nothing to be disclosed. **Advantages:** The disclosure rule covers millions of sales and leasing transactions annually. If problems are identified, the remediation can be integrated into normal housing finance systems. This focuses attention on known problems and could stimulate private sector investment**. Disadvantages**: The cost of inspections could slightly increase transaction costs and identified hazards could reduce property values if they are not corrected. However, disclosure has not been shown to reduce property values.

HUD should improve its Lead Safe Housing Rule, with Congressional authorization if determined necessary, to require lead risk assessments in the Section 8 Housing Choice Voucher Program, instead of the current requirement for a mere visual examination, which cannot reliably detect lead problems. Lead hazards are not visible to the naked eye. If testing is not universally mandated, Congress should require inspection/risk assessment as a condition of FHA single family mortgage insurance, and require that it be added to the Fannie Mae and Freddie Mac underwriting standards (FHA already requires this in multi-family mortgage insurance but not in single family mortgage insurance). **Advantages:** A large number of homes would be made lead-safe, implementation of these measures would simplify the rule and conform it to most other

[44] Brown MJ1. Costs and benefits of enforcing housing policies to prevent childhood lead poisoning. Med Decis Making. 2002 Nov-Dec;22(6):482-92.

[45] Title X of the 1992 Housing and Community Development Act.

[46] 24 CFR Part 35, Subpart A

housing programs, could stimulate private sector investment, other underwriting standards for other housing defects in FHA and GSE mortgages already exist, the low income housing tax credit system is already present in all states. Funding for lead hazard remediation could be more easily identified and the costs for remediation included in the financing package. **Disadvantages:** FHA, Fannie, Freddie are not owners, per se. The funding stream for hazard control for the housing choice voucher program is not clear, and tax credits are enforced by the Treasury (Internal Revenue Service), which may not have adequate expertise in the lead poisoning prevention field.

Track Houses, Not Just Poisoned Children. EPA and HUD should support efforts to maintain registries of the results of lead inspection and lead service line data and facilitate making it publically available and integrated into property searches and multiple-listing services. The Department of Health and Human Services, with HUD and EPA, should create a housing and drinking water hazard database that will enable local health, housing and water agencies to track the actual locations of lead-based paint hazards and lead service lines, that have been identified through health investigations, risk assessments, or private inspectors, and update remediation progress. The database will enable local health officials to easily link to the existing child health surveillance system, and also provide public reports of non-confidential information to facilitate and verify disclosure. **Advantages:** Could be linked to publicly available code data, could stimulate private sector investment linked to disclosure, reduces/eliminates need to repeatedly test homes. **Disadvantages:** Difficult to maintain, privacy issues, significant IT investment needed, potential for illegal housing discrimination.

Update All Rules Related to Housing Based On Current Science. Federal agencies (including EPA, HUD, and OSHA, and CPSC) should update, and keep current, their regulations on lead to reflect CDC's blood lead reference value and current science related to levels of lead in various media. In particular, EPA should update its lead dust standard based on recommendations from its own Science Advisory Board in 2010.[47] HUD's Lead Safe Housing Rule was promulgated in 1999 and OSHA's lead in construction regulation was promulgated in 1996.

Pediatricians, health care providers, and public health officials should routinely recommend individual environmental assessments of older housing, including homes that have undergone recent renovation, repair, or painting or that has been poorly maintained. Pediatricians and primary care and other health care providers should work with their federal, state, and local governments to ensure that a comprehensive inspection is conducted in the housing units of children who have blood lead concentrations greater than 5 µg/dL and that they receive appropriate case management.

Zero bedroom units sometimes contain young children, and they should be covered by statutory authority for the HUD lead poisoning prevention programs (Title X of the 1992 Housing and Community Development Act).

[47] EPA Science Advisory Board. 2010. Consultation on EPA's Proposed Approach for Developing Lead Dust Hazard Standards for Residential Buildings and Commercial and Public Buildings. https://yosemite.epa.gov/sab%5Csabproduct.nsf/F8DA254881FEC6898525778F004C789A/$File/EPA-SAB-10-011-unsigned.pdf

Local housing codes, with a few exceptions, do not cover lead-based paint hazards but should. Stronger enforcement of chipping, peeling paint housing code violations in pre-1978 housing is also an important prevention tool.

Paper 2: Lead In Water

This paper is adapted in part from an earlier report.[48] Lead seldom occurs naturally in rivers, lakes and other water sources. The pipes that carry water from the water treatment plant to water mains under the street supplying homes also normally do not add lead to water. If lead is found in drinking water, the most likely reason is the corrosion of one of the following: 1. Lead Service Line (a pipe that connects homes to the water main in the street). A lead service line is the largest potential source of lead exposure in drinking water. 2. Lead Solder – solder commonly contains lead and is used to connect copper piping. 3. Brass Fixtures – almost all water meters, faucets, valves and fittings manufactured prior to 2014 may have brass components which contain lead.[49]

Lead is present in plumbing infrastructure including lead service lines (LSLs), goose necks, lead solder, and brass fittings used in faucets and drinking water fountains. LSLs were installed in most houses built in the 1920s after which the use declined. LSLs were banned in 1986. Until 1986, brass fixtures and fittings could legally contain more than 8% lead, and solder could be made of more than 0.2% lead (most contained 40-50% lead). In 2014, federal regulations were updated so lead levels in brass fixtures and fittings had to be less than 0.25%.

Lead service lines were found to contribute 50 to 75% of the total lead mass in household tap water; premise plumbing was found to contribute an additional 20 to 35% (likely due to 'seeding' from LSLs); and faucets were found to contribute 1% to 3%.[50] The brass fittings and plumbing components have been implicated as the sources of lead in water at schools and large buildings, such as hospitals and universities, where LSLs are rarely present. Solder used to join various plumbing elements is known to be an occasional source of lead that can result in extremely high water concentrations.

Figure 7. Lead in typical water delivery system.

A recent national survey of community water systems suggests the number of LSLs in the country could range from 5.5 to 7.1 million, and may provide water to as many as 22 million

[48] Environmental Defense Fund. Lead Exposure from Multiple Sources: Interventions and Risk Communication September 20th-21st, 2016.

[49] Lead in drinking water. Kellog Foundation. http://ww2.wkkf.org/2016/digital/Water-FS-Homeowner4.pdf

[50] Sandvig, A., Kwan, P., Kirmeyer, G., Maynard, B., Mast, D., Trussell, R. R., Trussell, S., Cantor, A., Prescott, A., (2008). Contribution of Service Line and Plumbing Fixtures to Lead and Copper Compliance Issues. Prepared for the American Water Works Research Foundation, Report 91229.

people, although some others suggest the number may be closer to 10 million.[51] It has been estimated that the 81 million U.S. housing units (77% of total U.S. housing units), constructed prior to the federal ban of lead pipe and lead solder in 1986, likely contain lead solder joints and brass plumbing components.[52]

Lead in water occurs in several forms: dissolved ions, inorganic and organic complexes, colloidal matter and particulate lead (with lead content of the particulates varying from 3%-100%). Most often lead in water is characterized as dissolved lead or particulate lead. Dissolved lead contains lead complexes, colloids and ions of lead in water that leach or dissolve from the lead in pipes and plumbing. Particulate lead is defined as particles that do not pass through a 0.45 μm pore filter. These particles can be a result of crumbling solder, or the detachment of lead scales or rust from the plumbing or pipes. Water samples with lead particulates have been shown to be as high as 10,500 μg/L.[53]

The amount of lead dissolved in water is determined by the amount of time the water remains in contact with the lead plumbing, the temperature, pH, alkalinity, and other water chemistry parameters. Corrosion control aims to keep levels of dissolved lead in drinking water low.

A recent cross-sectional study of 306 children, aged 1 to 5 years, living in Montreal, and currently drinking tap water from their house, showed that children's blood lead was associated with low levels of lead in drinking water (mean lead in water of 1.91 μg/L collected after 30 minutes of stagnation) after accounting for age of housing, lead paint and house dust. The odds ratio between elevated blood lead levels (defined as ≥ 1.78 μg/dL) and drinking water levels of lead > 3.3 μg/L was 4.7 (95% CI: 2.1-10.2).[54] The authors also estimated that an increase of 1 μg/L in water lead resulted in an increase of 35% of blood lead after 150 days of exposure, and that a cumulative intake of ≥ 0.72 μg lead/kg body weight from household water—which could be achieved after daily consumption of 21 mL of water with a lead concentration ≥ 0.23 μg/L for 150 days—was associated with an increase in blood lead of at least 19%.

The American Academy of Pediatrics states: "Water typically contributes to approximately 20% of a child's blood lead concentrations if the water lead concentration exceeds 5 ppb. The contribution of lead from water can be much higher for some children, especially for infants who ingest large quantities of tap water. Children who reside in communities with lead service lines

[51] Cornwell, D. A., Brown, R. A., & Via, S. H. (2016). National Survey of Lead Service Line Occurrence. Journal American Water Works Association, 108(4); E182–E191.

[52] Triantafyllidou, S., & Edwards, M. (2012). Lead (Lead) in Tap Water and in Blood: Implications for Lead Exposure in the United States. Critical Reviews in Environmental Science and Technology, 42(13); 1297–1352.

[53] Triantafyllidou, S., Parks, J., & Edwards, M. (2007). Lead particles in potable water. Journal American Water Works Association, 99(6).

[54] Ngueta, G., Abdous, B., Tardif, R., St-Laurent, J., & Levallois, P. (2016). Use of a cumulative exposure index to estimate the impact of tap water lead concentration on blood lead levels in 1- to 5-year-old children (Montréal, Canada). *Environmental Health Perspectives*, 124(3); 388–395.

Ngueta, G., Prévost, M., Deshommes, E., Abdous, B., Gauvin, D., & Levallois, P.(2014). Exposure of young children to household water lead in the Montreal area (Canada): The potential influence of winter-to-summer changes in water lead levels on children's blood lead concentration. *Environment International*, 73; 57–65.

and inadequate anticorrosion control are also at increased risk for elevated blood lead concentrations."[55]

The CDC reviewed the relationship between elevated BLLs in children and the presence of a LSL over a period of different water disinfection practices in Washington, D.C. from 1998 to 2006. The study reported that the presence of a LSL was associated with higher BLLs in 9,860 children even after water lead levels were in compliance with the EPA standard of 15 ppb, after accounting for age of housing [OR of the presence of LSL when BLL ≥5 μg/dl: 1.4 (1.1, 1.9)]. Younger children (<16 months old) were affected more [OR of the presence of LSL when BLL ≥10 μg/dl: 3.7 (2.2, 6.2) vs OR of 1.5 (1.3, 1.8) when age >16 months.[56] [57] Routine water testing for lead during environmental investigation in response to cases of elevated blood lead levels is uncommon. For example, in 2009, of the 35 CDC-funded childhood lead poisoning prevention programs, only 15 reported that they routinely tested water when children had elevated blood lead levels.

Partial replacement of lead service lines has been suggested as a possible source of increased water lead levels, although inadequate flushing also contributes.[58]

In 1991, the U.S. Environmental Protection Agency (EPA) published the Lead and Copper Rule (LCR) under the authority of the Clean Water Act. LCR, which established that all community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) would be subject to the rule requirements. The primary purpose of the LCR is to protect public health by minimizing lead and copper levels in drinking water. A unique aspect of the LCR is that lead and copper have action levels (AL) of 0.015 mg/L for lead and 1.3 mg/L for copper, and therefore do not have Maximum Contaminant Levels (MCLs). The action level for lead is a screening technique for optimal corrosion control based on treatment feasibility, and is not a health-based threshold.[59]

In Flint, one study found that the incidence of elevated blood lead levels increased from 2.4% to 4.9% and was statistically significant ($P < .05$) after the water source was changed. The study also found that neighborhoods with the highest water lead levels experienced a 6.6% increase. Disadvantaged neighborhoods had the greatest elevated blood lead level increases.[60]

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[55] American Academy of Pediatrics, Council On Environmental Health. Prevention of Childhood Lead Toxicity. Pediatrics. 2016;138(1):e20161493

[56] Brown, M. J., & Margolis, S. (2012). Lead in drinking water and human blood lead levels in the United States. MMWR Supplements, 61(4); 1–9.

[57] Brown, M. J., Raymond, J., Homa, D., Kennedy, C., & Sinks, T. (2011). Association between children's blood lead levels, lead service lines, and water disinfection, Washington, DC, 1998-2006. Environmental Research, 111(1); 67–74.

[58] Reaction to the Solution: Lead Exposure Following Partial Service Line Replacement Rebecca Renner. Environ Health Perspect 118:a202-a208 (2010). http://dx.doi.org/10.1289/ehp.118-a202 [online 01 May 2010]

[59] Lead and Copper Corrosion: An Overview of WRF Research. Jonathan Cuppett, Water Research Foundation. Oct 2016. http://www.waterrf.org/resources/StateOfTheScienceReports/LeadCorrosion.pdf#search=lead

[60] Mona Hanna-Attisha, et al. Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response. Am J Public Health. 2016;106:283–290. doi:10.2105/AJPH.2015.303003

Suggestions for further deliberations on lead in water follow.

The Lead and Copper Rule for Drinking Water Should Be Updated and Enforced, consistent with recommendations from its National Drinking Water Advisory Council and both (1) extend corrosion control to all community water systems, (2) improve current corrosion control practice requirements for all systems and (3) address sampling deficiencies that can result in underreporting of water lead levels. EPA should improve oversight and enforcement of the lead and copper rule. According to one recent report, 5,363 community water systems serving over 18 million people committed 8,093 violations in 2015; yet EPA was able to take formal enforcement action against just 11.2 percent.

Lead Service Line Replacement. Lead service lines should be replaced on both private and public sides of a property line. Congress should expand funding of the Community Development Block Grant (CDBG) program, and make explicit authorization to address lead service lines as an eligible activity.

Reduce corrosivity of water: All Community Water Systems should actively manage corrosion within 10 years, with at least 90% of observed values less than 15 μg/L or 90% of observed values less than 10 μg/L. Full replacement of all lead service lines should also be completed within 30 years, which could be included in infrastructure improvements.

Make publicly available mapping of lead service lines in a city, town, and other jurisdictions. Congress should also amend Title X of the 1992 Housing and Community Development Act to enable disclosure of lead in drinking water, together with lead-based paint hazards, for residents and owners.

Significantly lower drinking water action level, which is now set at 15 parts per billion (ppb). In 1994, the FDA set the maximum amount of lead allowed in bottled water at 5 ppb. This action level could be adopted for all drinking water.

Paper 3. Surveillance and Responding to Children with Elevated Blood Lead Levels.

This paper is adapted in part from an earlier report.[61] Surveillance typically means testing of individual children's blood lead levels, also called "screening". Surveillance of children's blood lead levels provides a "report card" on how well we are protecting children from lead poisoning – and provides data needed to help those already exposed. Screening and surveillance data currently provide the foundation for targeting community prevention activities to areas where the risk is highest and for carrying out needed follow-up services for children affected by lead. However, many states and local jurisdictions have antiquated data systems due to inadequate funding from Congress and CDC, and these systems must be modernized and standardized. Perhaps most critically, as a nation we must expand beyond surveillance just of blood lead levels to provide surveillance of exposures – so that we can prevent those exposures and protect children before they are harmed by lead. Figure 8 shows recommendations from the American Academy of Pediatrics (AAP).

The AAP states: "A detailed evaluation and follow-up of children who have blood lead concentrations <10 μg/dL (<100 ppb) is now indicated. Current federal regulations for clinical laboratory testing through the Clinical Laboratory Improvement Amendments of 1988 permit an allowable laboratory error in blood lead proficiency testing programs of ±4 μg/dL (±40 ppb) for blood lead concentrations ≤20 μg/dL (≤200 ppb). This range of error can result in children being misclassified and cause additional anxiety or false comfort when blood lead concentrations within the margin of error erroneously are interpreted as going up or down. The majority of laboratories analyzing blood lead reference materials routinely achieved laboratory error of ±2 μg/dL (±20 ppb) at blood lead concentrations ≤20μg/dL (≤200 ppb). Changing the allowable laboratory error to tighter performance requirements, such as ±2 μg/dL (±20 ppb), could decrease misclassification of children and lead to better allocation of health care resources."

Case management involves a thorough investigation of potential sources of lead poisoning in a child's environment, including paint, house dust, water, and soil. Case management also includes a questionnaire and visual inspection for other potential sources of lead exposure, including antique furniture, toys, ethnic folk remedies, and consumer products such as imported food, cosmetics, and ceramics. A detailed protocol for investigating potential sources of exposure for children with elevated blood lead levels is contained in Chapter 16 of the HUD Guidelines.[62]

[61] Brown MJ, et al. Find It Fix It Fund paper on surveillance.

[62] Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing. 2012. US Department of Housing and Urban Development.
http://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes/lbp/hudguidelines

Figure 8. AAP Blood Lead Recommendations.[63]

TABLE 5 AAP Recommendations on Management of Childhood Lead Exposure and Poisoning

Lead Level	Recommendation
<5 μg/dL (<50 ppb)	1. Review laboratory results with family. For reference, the geometric mean blood lead concentration for US children 1–5 y old is <2 μg/dL (<20 ppb); 2.5% have a blood lead concentration ≥5 μg/dL (≥50 ppb). 2. Repeat the blood lead concentration in 6–12 mo if the child is at high risk for lead exposure or if risk profile increases. Follow all local and state lead screening recommendations. 3. For children initially screened before 12 mo of age, consider retesting in 3–6 mo for children at high risk; lead exposure may increase as mobility increases. 4. Perform routine assessment of nutrition and physical and mental development and assess risk factors for iron deficiency. 5. Provide anticipatory guidance about common sources of environmental lead exposure: paint in homes or child care facilities built before 1960, soil near roadways, take-home exposures related to adult occupations, and imported spices, cosmetics, folk remedies, and cookware.
5–14 μg/dL (50–140 ppb)	1. Perform steps as described above for blood lead concentrations <5 μg/dL (<50 ppb). 2. Retest venous blood lead concentration within 1–3 mo to verify that the lead concentration is not rising. If it is stable or decreasing, retest the blood lead concentration in 3 mo. Refer patient to local health authorities if such resources are available. Most states require elevated blood lead concentrations be reported to the state health department. Contact the CDC at 800-CDC-INFO (800-232-4636) or www.cdc.gov/nceh/lead or the National Lead Information Center at 800-424-LEAD (5323) for resources regarding lead poisoning prevention and local childhood lead poisoning prevention programs. 3. Take a careful environmental history to identify potential sources of exposures (see #5 above) and provide preliminary advice about reducing or eliminating exposures. Take care to consider other children who may be exposed. 4. Provide nutritional counseling related to calcium and iron. Encourage the consumption of iron-enriched foods (eg, cereals, meats). Encourage families to sign up for the Special Supplemental Nutrition Program for Women, Infants, and Children, if eligible. 5. Screen for iron sufficiency with adequate laboratory testing (complete blood cell count, ferritin, C-reactive protein) and provide treatment per AAP guidelines. Consider starting a multivitamin with iron. 6. Perform structured developmental screening evaluations at child health maintenance visits, because lead's effect on development may manifest over years.
15–44 μg/dL (150–440 ppb)	1. Perform steps as described above for blood lead concentrations 5–14 μg/dL (50–140 ppb). 2. Confirm the blood lead concentration with repeat venous sample within 1–4 wk. 3. Abdominal radiography should be considered for children who have a history of pica for paint chips or excessive mouthing behaviors. Gut decontamination may be considered if leaded foreign bodies are visualized on radiography. Any treatment of blood lead concentrations in this range should be provided in consultation with an expert. Contact local pediatric environmental health specialty unit (www.pehsu.net or 888-347-2632) or local or regional Poison Control Center (www.aapcc.org or 800-222-1222) for guidance.
>44 μg/dL (>440 ppb)	1. Follow guidance for blood lead level 15–44 μg/dL (150–440 ppb) as listed above. 2. Confirm the blood lead concentration with repeat venous lead level within 48 h. 3. Consider hospitalization or chelation therapy (managed with the assistance of an experienced provider). Safety of the home or child care facility with respect to lead hazards, isolation of the lead source, family social situation, and chronicity of the exposure are factors that may influence management. Contact your regional pediatric environmental health specialty unit or Poison Control Center or the CDC for assistance.

Modified from Pediatric Environmental Health Specialty Unit. Medical Management of Childhood Lead Exposure and Poisoning (http://www.pehsu.net/_Library/facts/medical-mgmnt-childhood-lead-exposure-June-2013.pdf).

Suggestions for further deliberation follow.

Surveillance Expansion and Modernization. The current national surveillance system is not nationwide, but should be. Congress should provide funding for the Centers for Disease Control and Prevention (CDC) Healthy Homes and Lead Poisoning Prevention program to fund all states. CDC should require funded states to report all blood lead tests in a standardized format through the non-communicable disease system. Reporting of all blood lead levels to CDC/NIOSH within the noninfectious disease system has been in place since 2010. Reporting of environmental exposures should be done within this same system.

CDC should provide resources at the local, state, and federal levels both to support appropriate professional staff and to update, upgrade, and integrate lead poisoning data systems critical to surveillance and case coordination efforts. This will allow for rapid assessment of lead poisoning incidence and targeting of prevention, education and outreach, environmental risk assessment,

[63] American Academy of Pediatrics, Council On Environmental Health. Prevention of Childhood Lead Toxicity. Pediatrics. 2016;138(1):e20161493

and lead hazard reduction by CDC and other federal agencies. CDC should work with local governments to establish a uniform response for a blood lead level.

The Centers for Medicare and Medicaid Services (CMS) should require that childhood blood lead testing be carried out, following the guidelines issued by state health departments, for medical visits to qualify for increased reimbursement under the Early and Periodic Screening, Diagnostic and Treatment Program (EPSDT). CMS and States could use waiver authority to carry out lead abatement and remediation, as was the case in Michigan recently.[64]

Engage OB/GYN Health Care Providers to Include Environmental Lead Surveillance in Homes During Pre-Birth Visits.

CMS and the Title V Maternal and Child Health Services Block Grant Program should provide reimbursement of home inspections/risk assessments during visits by all funded home visitors.

Ensure that Children Affected by Lead Receive Timely and Appropriate Services. CMS should incentivize all state Medicaid agencies to provide adequate reimbursement for comprehensive follow-up services for children affected by lead, including inspection and environmental follow-up activities, educational home visits, remediation, and developmental assessment.

The Department of Education should work with state boards of education to ensure that Individuals with Disabilities Education Act (IDEA) funded programs include children with a history of a blood lead level greater than or equal to 5 µg/dL under covered conditions for eligibility for services and that these children receive remedial and enrichment educational services as soon as delays are identified. Further the Department's Office of Civil Rights should investigate violations of the civil rights of lead-exposed children who have been denied services rightfully due them under IDEA. The Social Security Administration should also work with state boards of education to ensure that children identified with developmental delays due to lead poisoning be screened for eligibility to receive disability benefits (for "other health impairments)" as part of the IDEA.

The National Institutes of Health should develop and fund an agenda of basic and applied research to identify best practices for educational interventions for children affected by lead.

Pediatricians should work with public health officials to conduct surveys of blood lead concentrations among a randomly selected, representative sample of children in their states or communities at regular intervals to identify trends in blood lead concentrations. These periodic surveys are especially important for children who live in highly contaminated communities, such as smelter communities or regions with a historically high prevalence of lead exposure.

[64] Michigan gets federal OK to spend $119M on lead abatement. Updated: 4:36 PM EST Nov 14, 2016. Dave Eggers. http://www.wbaltv.com/article/michigan-gets-federal-ok-to-spend-119m-on-lead-abatement/8289395

Pediatricians and other primary care providers should test children for elevated blood lead concentrations if they live in or visit a home or child care facility with an identified lead hazard or a home built before 1960.

Paper 4. Consumer Products, Contaminated Sites and Other Sources

This paper is adapted in part from an earlier report.[65] A large number of products have been reported to contain lead; this paper discusses only a few. Products containing lead include (but are not limited to) the following: traditional folk remedies, toys, and other products with painted surfaces, including paint on plastic, fabric, or metal, key chains, cheap beads and artificial pearls, cultural or religious lead contaminated powders or products, new lead-based paint manufactured in other countries and metal jewelry for children. A list of lead in consumer products, including recalled products, is available from CDC and the Consumer Product Safety Commission (see: http://www.cdc.gov/nceh/lead/tips/sources.htm).

Several organizations have called for the elimination of non-essential uses of lead in consumer products, such as the American Public Health Association.[66] The elimination of the use of lead in new paint is addressed by the Global Alliance to End Lead Paint, led by the World Health Organization and the United Nations Environment Program (see: http://www.who.int/ipcs/assessment/public_health/gaelp/en/).

In 2010, over 1500 pieces of jewelry sampled from 42 major retailers in California over a one-year period, and found about 4% of the jewelry did not comply with California lead standards and 26 retailers were in violation.[67] Effective August 2011, the current federal limit for the amount of total lead allowed in most new products for children 12 and younger is 90 ppm (parts per million). Lead in adult jewelry remains unregulated.

Some hair dyes contain lead acetate. A 1991 review found that use of hair dye containing lead acetate can result in exposure to 600 μg of lead/use and 30.7 μg/day dermal absorption of lead. A 1997 study showed lead transferred to hands, objects and other surfaces (up to 436 $\mu g/ft^2$), following controlled applications. The study found as much as 689 μg of lead/use on the hands and 26 to 79 μg of lead remaining even after washing.[68]

Over the last decade, there have been several reports of adult poisoning from *ayurvedic* (Indian traditional) medicine, some of which (*Bhasmas* or *Rasa*) are prepared with high concentrations of several heavy metals, including lead. In 2012, there were 2 cases of children poisoned in US. Greta and Azarcon (also known as Alarcon, Coral, Luiga, Maria Luisa, or Rueda) are Hispanic traditional medicines taken for an upset stomach (empacho), constipation, diarrhea, and vomiting. They are also used on teething babies. Greta and Azarcon are both fine orange powders with lead content as high as 90%. Ba-baw-san is a Chinese herbal remedy that contains lead. It is used to treat colic pain or to pacify young children.

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[65] Environmental Defense Fund. Lead Exposure from Multiple Sources: Interventions and Risk Communication September 20th-21st, 2016.

[66] APHA Calling for a Global Ban on Lead Use in Residential Indoor and Outdoor Paints, Children's Products, and All Nonessential Uses in Consumer Products. Policy Date: 10/28/2008. Policy Number: 20084

[67] Cox, C., & Green, M. (2010). Reduction in the Prevalence of Lead-Containing Jewelry in California Following Litigation and Legislation, Environmental Science and Technology, 44(16); 6042–6045.

[68] Mielke, H. W., Taylor, M. D., Gonzales, C. R., Smith, M. K., Daniels, P. V. and Buckner, A. V., (1997). Lead-based hair coloring products: Too hazardous for household use. Journal of the American Pharmaceutical Association, 37(1); 85-89

Lead can also be present from earlier use, resulting in contaminated sites. Except for the EPA Superfund program, there is not a centralized listing of contaminated sites.[69] This can result in locating facilities (such as housing) on such sites, resulting in needless exposure. The most recent example of this problem is the East Chicago site in Indiana, the site of former lead facilities.[70]

The following suggestions are provided for further deliberation.

The CPSC has some standards and testing requirements for products primarily designed for children < 12 years old, but there are no similar standards for adult jewelry, electronics and plastic products, which can result in children's exposure. Leaded paint is still allowed in non-consumer applications. CPSC can set standards for lead in non-children's consumer products and recall products that cause lead exposure.

Leaded aviation fuel, wheel weights and cosmetics containing lead should be phased out.

Leaded aviation gasoline, or avgas, which is used in a large fraction of piston-engine aircraft in the United States, is the single largest source of lead to the air, contributing about 59 percent of the National Emission Inventory in 2011. A recent MIT study estimated nationwide economic losses of over $1 billion annually due to the IQ deficits caused by leaded avgas emissions alone. Phasing lead out of automobile gas in the 1970s was a huge public health advance. In addition to phasing it out, EPA should require airports where leaded fuel is in use to monitor and report ambient air concentrations of lead.

A Listing of contaminated lead sites should be made available to the public.

Battery Recycling. EPA should set stronger national emission standards for battery recyclers (also known as secondary lead smelters), which are currently under reconsideration at EPA. More than 80,000 people experience elevated health threats from the 14 currently operating facilities, located in 10 states and Puerto Rico. Children are disproportionately exposed to these facilities. In the most-affected communities, 41 percent are people of color (compared to 25 percent of the national population); 52 percent of the exposed people are Latino or Hispanic (compared to 14 percent of the national population).

Air Emissions. EPA should also reduce children's exposure to new lead-in-air emissions from other major industrial sources. For example, electric power plants emit about 63,711 pounds of lead per year. The Toxic Release Inventory for 2014 includes a total of 367,761 pounds per year of lead air emissions from all reporting industries. EPA has found that the highest concentrations of lead in air near lead-emitting stationary sources are generally found near smelters, but a number of other types of sources also emit significant amounts of lead. Reducing these exposures is also necessary to protect workers at these facilities.

[69] Lead ata Superfund Sites. https://www.epa.gov/superfund/lead-superfund-sites

[70] Lyons C. Owners of former East Chicago lead factories named in suit. Chicago Tribune. http://www.chicagotribune.com/news/ct-ptb-east-chicago-class-action-st-1007-20161006-story.html

Wheel Weights. The United States Geological Survey estimates that 4.4 million pounds per year of lead enter the environment due to lost lead wheel weights and studies show that about half of the wheel weights are abraded into small pieces. EPA commence rulemaking to eliminate this source.

Paper 5. Funding

The nation currently spends an estimated $50.9 billion annually to cover the costs of childhood lead exposure (2008 dollars).[71] Instead of continuing to absorb these costs, the nation should invest in prevention. For each dollar spent on controlling lead-based paint hazards, we get at least $17-221 in benefits,[72] a cost-effectiveness rivaling vaccines.[73] This is a net savings of $181–269 billion. This investment should come from the private sector, government, and philanthropy.

The cost to abate lead-based paint hazards (which includes paint (especially windows), dust and soil) in housing ranges greatly, averaging about $10,000 per house. Replacing a lead water service line costs $2,500 to $8,000. With approximately 23 million homes having significant lead paint hazards (3.6 million of which may have young children) and an estimated 6 to 10 million lead service lines, the financial commitment needed to eliminate lead is large, but much less than continuing to absorb the costs of lead exposure.

The rest of this paper contains suggestions for further deliberation.

Invest Resources to Address Lead Hazards as Part of Infrastructure Improvements. To address lead hazards effectively, Congress should increase its appropriations to ensure that affordable, public, and subsidized housing is safe for children. The $110 million annually appropriated for HUD's lead hazard control grant program the last three years can cover only a small fraction of the housing needing assistance. Further, old single pane windows are known to have the worst lead contamination compared to other building components. Replacement of those windows with lead-free Energy Star windows creates jobs, improves home value, and eliminates a major contributor to lead exposure.

Make Lead like Any Other Housing Deficiency: Leverage the Mortgage Market. New purchasers typically correct housing problems at the time of sale or refinancing. The federal government, Fannie Mae, Freddie Mac, and the other government sponsored enterprises (GSE) can use their substantial role in the mortgage market to help finance lead elimination. Mortgages purchased by government sponsored enterprises (GSEs), specifically the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) are for properties that are "safe, sound, and structurally secure."

The Federal Housing Administration (FHA), Department of Agriculture (USDA), and the Department of Veterans Affairs (VA) should require a lead risk assessment and abatement of lead-based paint hazards in pre-1978 structures and identification and replacement of lead service lines for government insured mortgages. Currently, multifamily properties receiving FHA mortgage insurance are subject to the Department of Housing and Urban Development's (HUD) lead-safe housing rule, but for single-family properties, FHA only requires that the

[71] Tresande and Liu. 2011. Reducing the staggering costs of environmental disease in children. Health Affairs 30(5);863

[72] Elise Gould, Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control. Environmental Health Perspectives. 117 (7) July 2009.

[73] World Health Organization. Childhood Lead Poisoning. 2010.

"[m]ortgagee must confirm that the Property is free of lead paint hazards," based on the absence of past reports and a visual assessment, not an actual risk assessment—and there is no abatement requirement. FHA requires lead-free pipes for new wells, but existing lead service lines are not addressed.

HUD should allow 203(k) rehabilitation loans to include lead service line replacement and promote lead-based paint abatement. These loans are underutilized and many homebuyers are unfamiliar with the option to increase their mortgage loan amount to be able to easily cover the cost of abatement. Additionally, HUD should create a "Healthy Homes Mortgage," similar to the Energy Efficient Mortgage, to finance lead abatement and other healthy housing improvements.

The Federal Housing Finance Agency (FHFA) should require, prior to obligation under a sale or lease contract, testing (if not previously performed) of lead paint, dust, and soil, and a visual inspection of the service line and, where available, a report from the water utility to assess whether it contains lead.

Lead risk assessors and inspectors should provide copies of reports to any mortgage holders and property insurers of facilities inspected. Massachusetts found properties with hazards were abated more quickly when this information was shared with mortgage holders.

Increased Resources Are Needed. Congress should provide adequate appropriations for HUD to support abatement in low income housing as well as to enforce its lead regulations. Tax credits could be authorized to address lead hazards in houses not included in the HUD program. Congress should provide HUD $2.5 billion annually for each of five years ($12.5 billion total) to provide abatement of lead dust, paint, and soil hazards including window replacement in the estimated 1.25 million low-income pre-1960 units with lead hazards occupied by or likely to be occupied by children under six years old where risks are greatest, including housing choice voucher units. Congress should also provide an additional $25 million annually to HUD to increase enforcement of its Lead Safe Housing Rule.

Congress should fully fund CDC's Healthy Homes and Lead Poisoning Prevention Program providing at least $35 million annually to fund lead surveillance, coordination of appropriate interventions and risk communication, and tracking progress at removing sources of lead exposure.

Congress should expand funding of the Community Development Block Grant (CDBG) program, and make explicit authorization to address lead service lines as an eligible activity. Congress should pass the Home Lead Safety Tax Credit Act of 2016 (S. 2573) that establishes a tax credit for income-qualified owners of pre-1978 homes who conduct lead hazard remediation in their property following the Lead Safe Housing Rule. The Department of Treasury should issue a ruling allowing lead abatement to be universally considered a medical expense for tax purposes, including utilization of Health Savings Accounts for this purpose.

Congress should incentivize private investment in lead-based paint abatement and lead service line replacement by creating a very low or no interest loan program accessible to home and building owners, with the option for forgivable loans for income-qualified applicants. The

Department of the Treasury should require that projects receiving Low-Income Housing Tax Credits are in compliance with Subpart J of HUD's Lead Safe Housing Rule governing rehabilitation work. Treasury should also require that all Qualified Allocation Plans specifically require the determination and elimination of lead-based paint hazards and lead service lines.

Federal agencies and Congress should ensure that the Weatherization Assistance Program, LIHEAP, and other federal programs supporting energy efficiency recognize the health benefits and cost savings of window replacement.

Encourage Philanthropic Investment. Private sector and federal agency activities should be well coordinated with the philanthropic community to target investments in lead elimination. Congress should authorize a Lead Poisoning Prevention Pay for Success (PFS) Project to demonstrate that actual cost savings are realizable by evaluating the long term return on investment in medical, educational, criminal justice, taxable income, and other benefits. PFS is a contractual arrangement that allows for evidence-based programs to be funded by investments from philanthropic and private entities which in turn earn a return on investment through success payments based solely on the achievement of measured outcomes.

A funders' roundtable of national and local foundations with an interest in environmental health or safe affordable housing should be convened with the goal of engaging the philanthropic community to collaborate in identifying and filling gaps in a national lead elimination plan

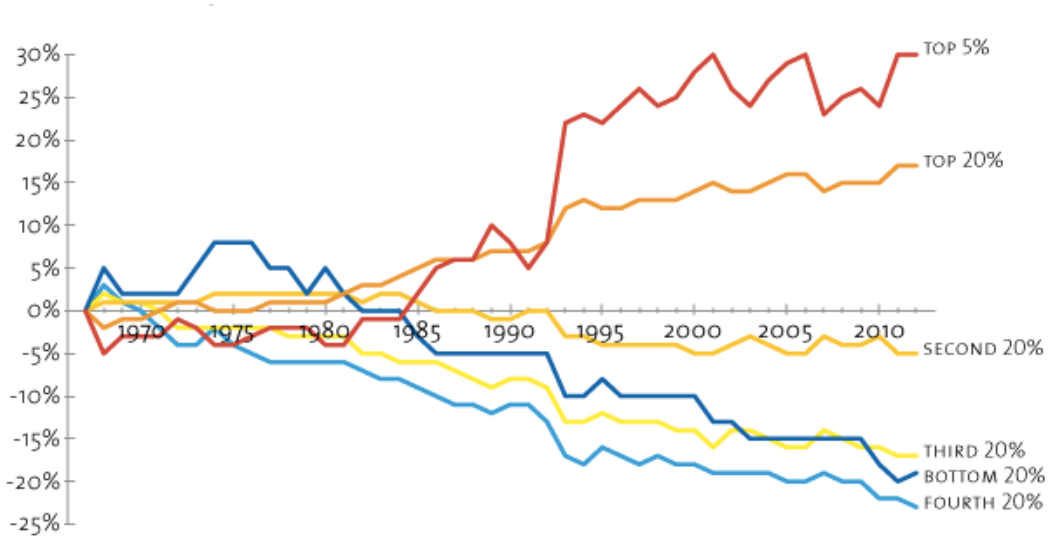
Paper 6. Job Creation, Infrastructure Investment and Workforce Development

Michael Wilson, PhD, MPH
Wes Stewart, Esq.

Lead poisoning and economic stress go hand-in-hand

Income inequality has increased in many industrialized countries, but it is especially pronounced in the United States. In the first three decades after World War II, real compensation (wages and benefits) moved roughly in tandem across all sectors of the American economy; since 1979, however, the U.S. has experienced a striking increase in income inequality (Figure 9). During this period, over 15% of national aggregate income shifted from the bottom 90% of the income distribution to the top 10%.

Figure 9. The Change in Share of U.S. Total Income, 1967—2012, by Percentile.



As a consequence of income insecurity and other factors, 44% of U.S. children under age 18 now live in low-income households, defined as 200% of the federal poverty threshold; one in five children (20%) live at or below the federal poverty threshold.[74] While about 30% of white and Asian children live in low-income families, about twice that percentage (63%) of Black, American Indian and Hispanic children live in low-income families. Reductions in unemployment rates and recoveries from economic downturns have historically lagged behind the national economy in low income population areas.

[74] Jiang, Ekono, Skinner (February 2016). *Basic Facts About Low Income Children. Children under 18 years, 2014*. Columbia University, Mailman School of Public Health, National Center for Children in Poverty [Available: http://www.nccp.org/publications/pub_1145.html] (Accessed Nov 15, 2016).

In 1991 and again in 2012, the Centers for Disease Control and Prevention concluded that no blood lead level in a child's body has been identified at which there is no harm. The long-term cognitive effects of lead poisoning present enormous costs to society and pose yet another barrier to stabilizing household budgets and escaping poverty for millions of American families.

Lead remediation infrastructure investments will put people to work and protect the health of millions of children.

Infrastructure investments to eliminate lead hazards in high-risk homes and replace lead service lines will therefore have multiple benefits: they will mitigate the high personal and social costs of lead poisoning, and—if properly designed—they will offer a means of employment and the possibility of financial stability for tens of thousands of low-income families. These investments have a multiplier effect across the economy: every dollar invested in infrastructure employment creates $1.75 in related economic activity.[75]

And there is an enormous amount of work to be done. The U.S. Department of Housing and Urban Development estimates that 37 million U.S. housing units contain lead-based paint; of these, 23 million are estimated to have significant lead hazards associated with lead contaminated dust, deteriorated lead-based paint and contaminated soil.[76] In addition, the public health disaster in Flint, Michigan illustrates the potential for lead exposures to occur from lead pipes that connect a water main to individual or multiple-family housing units. Lead service lines are the leading source of lead contamination in residential water.[77]

A 2016 survey by the American Water Works Association (AWWA) reported that about 293 million Americans receive residential water from Community Water Systems; of these, between 15 and 22 million people (7%) receive their water through either a full or partial lead service line. AWWA estimates that there are 6.1 million lead service lines in operation in the U.S. today,[78] although some estimates are on the order of 10 million. Tens of thousands of jobs are needed to do the work of lead paint remediation and lead pipe replacement.

Large-scale infrastructure investments to remediate or abate lead paint hazards in housing and replace lead service lines will produce a sharp reduction in the social costs of childhood lead poisoning. Gould estimates that the long-term savings to society of preventing lead exposures in one million housing units for children ages 6 and under (not including savings associated with lead pipe replacement) are $11–$53 billion for health care services, $30–$146 million for special education, $267 million for services associated with attention deficit–hyperactivity disorder, and $1.7 billion in direct costs associated with criminal activity, as well as $25–$35 billion additional

[75] Jason Walsh, Josh Bivens and Ethan Pollack. Feb 2011. Economic Policy Institute & Blue Green Alliance.
[76] U.S. Department of Housing and Urban Development. American Healthy Homes Survey Lead and Arsenic Findings. April 2011. Office of Healthy Homes and Lead Hazard Control
[77] 40 CFR 141.2 defines: "Lead service line means a service made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting which is connected to such lead line."
[78] Cornwell, D. A., Brown, R. A., & Via, S. H. (2016). National Survey of Lead Service Line Occurrence. Journal American Water Works Association, 108(4); E182–E191

tax revenues realized from $165–$233 billion in improved lifetime earnings achieved among this cohort as a consequence of greater employment potential.[79]

Put another way, for every dollar invested in lead hazard remediation, between $17–$221 is returned in the form of health care benefits, increased IQ and school performance, higher lifetime earnings, tax revenue, reduced spending on special education and ADHD services, and reduced criminal activity. This return is striking when compared to the benefits of vaccination against the most common childhood diseases, which saves between $5.30 and $16.50 in costs for every dollar spent on immunizations.[80]

Creating high-quality jobs and hiring locally will benefit the families and communities whose children are the most affected by lead poisoning.

By hiring from low-income, minority communities, infrastructure investments can provide skills training, work experience and the possibility of economic stability for tens of thousands of American families whose children have been disproportionately affected by lead's toxic legacy. Lead remediation infrastructure jobs can provide full-time entry and mid-level positions to many of the more than 630,000 individuals returning home from incarceration each year. By providing unemployed, underemployed and low-income residents with stable employment, these investments can help restore the health of communities and create long-term pathways out of poverty. This reduces recidivism and the need for continuing reliance on direct government financial support.

These jobs offer the greatest promise for low-income families if they include apprenticeship training, living wages, safe working conditions, opportunities for advancement, and family-friendly benefits. These so-called "high-road" jobs differ from "low-road" jobs, which typically include little to no training, poor wages and benefits, and hazardous working conditions. The costs of high-road employment are steeper for employers, but the costs of low-road employment don't just disappear: they show up as turbulence in the job market, high turnover, untrained workers, economic stress for families, higher job injury and fatality rates, and greater costs to publicly funded programs, such as Medicaid, taxpayer-funded vocational schools, payments for uncompensated medical care and indigent senior support, and long-term disability payments.

Public policies, regulation and incentive programs will be needed to support high-road employment in the construction and home renovation industries, where lead abatement and lead pipe replacement work will take place.

Employment policies in California and Texas have produced markedly different labor conditions.

[79] Elise Gould, Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control. Environmental Health Perspectives. 117 (7) July 2009.

[80] . Zhou F et al. 2005 Economic evaluation of the 7-vaccine routine childhood immunization schedule in the United States, 2001. Dec;159(12):1136-44.. Zhou F(1), Santoli J, Messonnier ML, Yusuf HR, Shefer A, Chu SY, Rodewald L, Harpaz R

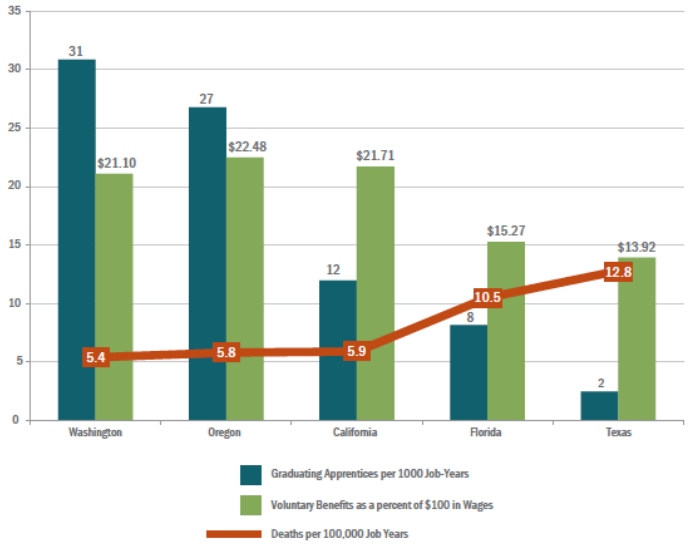
California has demonstrated that public policies can steer entire industry sectors toward high-road employment, with multiple benefits for workers, their families, taxpayers, the economy, and the industry itself. These types of policies can be applied in creating the jobs that are needed in lead hazard remediation and lead pipe replacement.

Between 2000 and 2014, California's renewable energy sector created 10,200 construction jobs during the expansion of the state's solar-based, utility-scale electrical generating facilities. These jobs pay $78,000 on average per year and offer full health and pension benefits. Another 1,600 jobs were created in response to new business activities associated with these projects. These newly created construction, maintenance, and business-related jobs boosted consumer spending, which in turn created more than 3,700 additional jobs across the economy. In total, more than 15,000 new jobs were created by the renewable energy construction sector in California during this period.

In contrast, Texas has followed a "low-road" employment pathway in construction, with many contractors underpaying workers, denying health and pension benefits, and making under-the-table cash payments. While low-road employers also operate in certain sectors of the California construction industry, the scale of low-road employment in Texas is striking. A 2015 study of the Texas construction industry, for example, estimated $7 billion in unreported wages annually and found that 50% of construction workers reported being denied overtime pay for overtime work. 70% reported receiving no health benefits, pension, or other benefits.

In 2012, Texas invested $54 million in construction apprenticeship training programs, compared to California's $300 million. While this lack of training can affect the quality of work performed (which can be particularly disastrous in lead hazard reduction work) it can also contribute to a higher risk of injury or death on the job. During the period 2012 to 2014, for example, the Texas and California construction industries employed about the same number of workers (616,000 and 634,000 respectively), but nearly twice as many construction workers died on the job in Texas (326) as in California (166) (Figure 10).

Figure 10. Voluntary benefits, apprenticeship training, and construction industry fatality rates, 2012.



Purchasing materials from American manufacturers further supports families and communities.

Community health is further improved when infrastructure investments encourage or require that lead hazard control and other related products be purchased from domestic manufacturers whenever possible, and that those products are manufactured using safer materials and chemicals. This has its own multiplier effect, because American manufacturing jobs tend to come with decent wages and benefits: manufacturing workers earn just over $26 an hour, for example, and 92% have access to employer-sponsored health care plans, compared to 79% of U.S. workers overall. The great majority of the 252,000 manufacturing companies in the U.S. employ fewer than 20 workers; only 3,700 (1.5%) employ more than 500 employees. All of these companies—along with their employees and communities—would benefit from the production increases that would occur if domestic purchasing is included as part of infrastructure investments to remediate household lead hazards and replace lead service lines.

The remainder of this paper provides suggestions for further deliberation.

Create high-road jobs. Congress should enact infrastructure policies that support the creation of high-road jobs, with apprenticeship training, family-friendly wages and benefits, provisions to ensure on-the-job safety, and opportunities for advancement. This should include language requiring that contractors pay wages at the rates prevailing in the communities where they work, consistent with the Davis–Bacon Act of 1931. These policies should include provisions to encourage participation by contractors who have demonstrated a commitment to high-road employment and effective worker safety and health programs. Contractors who have repeatedly violated OSHA or other Department of Labor (DOL) regulatory requirements should be prohibited from participating.

Support training opportunities. Congress should provide funding to support training in the building and construction trades that support the basic lead hazard abatement and lead service line replacement work needed in millions of homes. While it is relatively straightforward to provide training to tradespersons on working safely around lead, many localities lack plumbers and carpenters with the skills necessary to perform the underlying tasks that are part of lead abatement work. Funding should be provided to apprenticeship programs, vocational schools, and community colleges, including those in small and mid-size cities, to carry out this training. Professional training: Congress should provide funding to support training for lead professionals, such as lead hazard assessors, planners, supervisors, trainers and others. The Department of Labor training programs, including those in individual states, should coordinate with EPA and its delegated states to ensure a sufficient supply of lead hazard professionals. Congress should provide funding to support low- to no-cost training in lead safe work practices, as required under EPA's Renovation, Repair, and Painting (RRP) rule, and it should amend Title X to eliminate the requirement that EPA set licensure and certification fees to cover the cost of administering these programs. Under the current requirement, small contractors and individuals often find the cost of licensure or certification to be a barrier to entry; these trainees should be exempt from the fees set by EPA. EPA should use its grant guidelines to encourage delegated state programs to likewise reduce or eliminate certification and licensure fees for trainees.

Support local hiring. HUD should ensure compliance with Section 3 requirements for low-income employment opportunities in its lead hazard control grants, and Congress should expand requirements to ensure opportunities for minority and female hiring in future lead paint and lead pipe grant funding awards. Technical support, increased allocation of funds to training, and additional monitoring is needed.

Support American manufacturers. Congress should require HUD and EPA to develop and enforce purchasing specifications for products that are permissible for use by contractors who perform lead service line replacements and who conduct lead hazard reduction work. The specifications should favor domestically manufactured products to the greatest extent practical and should include provisions to support the manufacture of products that are safer for workers and residents, such as healthy building materials.

Support state monitoring and enforcement. Congress should appropriate funds for use by HHS, EPA, and HUD to provide expanded training and hiring for state and local government staff to implement lead elimination plans and conduct public health data analysis, code enforcement, program management, interagency program coordination and other functions.

Local funding support. Secure increased funding in private and other local government spending for infrastructure and workforce development including local match funding for federal investments.

Environmental health workforce. Congress should support adequate environmental health staffing throughout the states to have their environmental health workforce receive a verifiable certification or credential of environmental health knowledge to ensure that all decisions and services provided are based on current science and best practices in the field.

Lead poisoning elimination plan and workforce development assistance. State and local government staff working at health and housing agencies need increased technical assistance on lead elimination. Congress should appropriate funds to provide expanded training for state and local government staff on topics related to the successful implementation of lead elimination plans, including public health data analysis, code enforcement, and project and program management. Funding should also support the creation of fellowship programs in collaboration with interested state and local governments to support the placement of executive level lead elimination coordinators who would oversee the implementation of local elimination plans and workforce development of increased contractor capacity.

Editorial

Lead Poisoning: Focusing on the Fix

David E. Jacobs, PhD, CIH

Infuriating, frustrating, saddening, racism, demands for solutions—only a few of the words to describe reactions from the public health community and the public at large to the news of the lead in drinking water debacle in Flint, Michigan.

As the nation increasingly turns to its public health professionals for answers, we must speak clearly and forcefully, communicate accurately based on what the science tells us, focus on securing resources needed for solutions, and then make sure that both short- and long-term fixes are really working. To do all that, we must reinvigorate and empower the public and environmental health professionals on which the public relies and reject ill-conceived decisions that:

- disinvest in our communities,
- steal the wealth of our infrastructure by failing to maintain it,
- pinch pennies to benefit only a few, and
- put short-term expediency before long-term welfare.

Two articles in this issue report the ongoing and needless tragedy of childhood lead poisoning. Knighton et al[1] show that even for children in Medicaid, where blood-lead screening is already required, only 39% are actually tested. Coyle et al[2] show that the housing code process established through the International Code Council continues to be exceedingly slow and, in fact, has continued its historic practice of completely ignoring chronic health issues such as lead poisoning in its model codes. While the 2014 National Healthy Housing Standard (an update of the 1985 APHA [American Public Health Association]/CDC [Centers for Disease Control and Prevention] Minimum Housing Standards) marks an important step forward,[3] the Coyle et al data suggest the housing regulatory process is excruciatingly slow and halting, at best. Together, both articles demonstrate the need for more robust and effective responses to lead poisoning, which causes 675 000 deaths around the globe,[4] and at least 535 000 children in the United States have blood-lead levels above the CDC reference value.[5]

Resources and policy work best when both are comprehensive, yet in all the commentary about Flint, 2 questions have historically hobbled both policy and resources to protect children from lead poisoning: How did that lead get into our pipes and our paint in the first place? And more importantly, why have those who put it there been absolved of responsibility to help fix the mess they made, leaving it to taxpayers and parents to absorb the huge cost of lead poisoning (estimated at over $55 billion annually in the United States alone)?[6]

The Lead Industries Association (LIA) and paint companies such as Sherwin-Williams, PPG,* and Valspar (all US entities) knowingly made dangerous lead products and succeeded in blocking public health and government from stopping their contamination of millions of our homes, our air, and our drinking water. In 1938, the LIA stated, "In many cities, we have successfully opposed ordinance or regulation revisions which would have reduced or eliminated the use of lead."[9] In 1958, the LIA stated, "Every effort is being made to confine ... regulatory measures ... to warning labels ... which are less detrimental to our interest than would be any legislation of a prohibitory nature."[10(p102)]

This pattern continues today. In 2014, a group of investors requested the Securities and Exchange Commission (SEC) require Sherwin-Williams to include in

Author Affiliations: National Center for Healthy Housing, Washington, District of Columbia; and University of Illinois at Chicago School of Public Health.

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Correspondence: David E. Jacobs, PhD, CIH, National Center for Healthy Housing, 5025 Hawthorne Pl NW, Washington, DC 20016 (djacobs@nchh.org; dejacobsdc@gmail.com).

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*On April 20, 2016, PPG agreed to stop manufacturing new lead paint under pressure at its annual shareholders' meeting in Pittsburgh.[7] However, Sherwin-Williams refused to end its production of new lead-based paint.[8]

J Public Health Management Practice, 2016, 22(4), 326–330

its annual meeting proxy materials for its shareholders a proposal that the company "establish a policy and eliminate the use of all lead compounds in its products." But Sherwin-Williams successfully (and incredibly) argued that the proposal be excluded from its shareholder meeting, because the manufacture of new lead paint was part of its "ordinary business operations." The SEC caved in and took no action.[11]

Those "ordinary business operations" mean that these companies continue to make *new* lead-based paint in other countries, contaminating even more homes. Sherwin-Williams' "Dutch Boy" lead paints have been found in homes in Lebanon and many other countries.[12,13] Indeed, Sherwin-Williams and other irresponsible manufacturers have unfortunately succeeded in "Covering the Earth" with lead. But the world's biggest paint company, AkzoNobel, agreed to stop making new lead paint in 2011 and noted, "there is no need or justification to intentionally add lead compounds to paint."[14]

Aside from industry, what about government? There is certainly evidence of myopia and poor leadership at many levels. For example, one of the nation's top public health leaders, CDC's Director Tom Frieden, should not have disbanded the only federal expert advisory committee on lead poisoning in 2013. He should not have tried to cut the CDC lead funding in half, and Congress should not have practically wiped it out in 2012.[15] The US Department of Housing and Urban Development's (HUD's) lead program has fared little better, with funding slipping from $176 million in 2003 to only $110 million last year. Even with inadequate funding, these programs have been shown to work, just not as well as they could if they had the needed resources. For example, households receiving government housing assistance are about twice as likely to live in lead-safe homes (12% of government-assisted housing has lead hazards, compared with 22% of houses not receiving assistance).[16]

In 2000, I helped to craft a cabinet-level Presidential task force plan that would have eliminated the problem by 2010, including an interagency budget plan.[17] But Congress never funded it adequately, and as a direct result, the problem has dragged on needlessly, with much higher costs for property maintenance, special education, crime, health care, litigation—and, of course, human suffering.

The federal government has not established a new national plan to prevent lead poisoning, despite calls from citizens, scientists, and practitioners to do so, nor updated its lead regulations.[18] There has not been a cabinet-level meeting of the President's Task Force on Environmental Health and Safety Risks to Children since 2004. The US Environmental Protection Agency's (EPA's) lead and copper rules for drinking water were last updated 25 years ago, and its water sampling methods fail to reveal problems before harm is done, as the Flint experience has so painfully shown. EPA lead dust and soil regulations were issued 15 years ago, although its own Science Advisory Board recommended clear steps to update them 6 years ago.[19] The Occupational Safety and Health Administration's Lead Standards to protect workers were last updated in 1978 (Industry) and 1996 (Construction); both standards still include an adult blood-lead action level of 50 μg/dL, which the science makes clear does not protect health. HUD's regulations were issued 16 years ago. And there has been inadequate enforcement of even the outdated regulations.

A 1996 federal HUD/EPA rule governing disclosure of lead hazards at the time of sale or lease has not had the intended effect of increasing private investment in making homes safe before children move in. Under pressure from the real estate industry in 1996, the federal lead paint disclosure law[20] typically discloses nothing of real value because it does not require any actual testing. EPA's rule on Renovation Repair and Painting was issued 8 years ago and remains inadequately enforced and persists in using an unvalidated dust test to ensure the house is safe for children at the end of the job.

We can draw certain conclusions from all this:

- Those industries that created this problem have not been held accountable.
- The medical model is insufficient (blood-lead screening and responding only after children are poisoned).
- Housing codes fail to address lead and other compelling health and safety hazards.
- Federal agencies have failed to update regulations and standards based on the most recent science.

National Objectives for a Lead Elimination Action Drive (NO LEAD): A 3-Point Plan

Although the recent CDC statement correctly requires primary prevention,[21] the question remains, how can we really get there? A 3-point initiative to find the lead, fix it, and fund it is outlined.

Find it

Although proven detection technologies are available, we still do not know exactly where all lead water pipes and fixtures actually are. We also do not know exactly which surfaces in homes have lead paint and lead dust and lead soil hazards.

In addition to increased testing of homes and pipes, we should expand the number of children who are screened to identify early on those who have been harmed. All at-risk children should have their blood tested at least twice before the age of 2 years, especially Medicaid-eligible children. CDC's surveillance should

be funded adequately to provide those results for all states and large cities.

Visual examinations for deteriorated paint are still widely used in code compliance, section 8 housing choice vouchers, and many other housing programs. But because lead is not visible to the naked eye, and because lead dust is the main route of exposure for most children, visual examination of paint alone is clearly inadequate. We have well-validated risk assessment and lead inspection protocols and a licensed workforce to implement them. Why not use them?

In short, we should test our homes, drinking water supply lines, yards, playgrounds, schools, and other places children frequent before they are harmed. We should end the practice of responding only after they have been poisoned. Such increased testing could be done by requiring a lead inspection at the time of sale or lease and including information about the presence of lead water supply lines.

Fix it

Both long- and short-term techniques to correct and control lead hazards have been well-validated.[22] But instead of fixing the causes of the problem, a common public health practice is to simply move a poisoned child into another home, only to have a new child move into the home to be poisoned by the uncorrected hazards.[23] Once we know where the lead hazards are, prompt action should be taken to correct them. For example, homes with high lead levels in water need ongoing valid monitoring, corrosion control, filters, and/or bottled water until the lead pipes can be replaced. Public health and drinking water professionals need veto power over changes to their water chemistry and/or source. We should begin a long-term program to eliminate all lead drinking water pipes. For homes with lead paint hazards, we should implement immediate, proven measures to correct deteriorated paint and clean up lead dust and soil, as well as a simultaneous long-term effort to remove all residential lead paint from the US housing stock. We need both short- and long-term strategies, not just Band-Aids.

We should ensure that lead-poisoned children get special education needs assessments and provide therapeutic special education and other programs to help mitigate the effects of lead poisoning. Currently, lead poisoning is not a reason for a special needs assessment in most schools, but if children are lead poisoned, it is clear they will have trouble learning.[24] Instead of merely criticizing teachers whose students struggle, we should act to address some of the root causes, and lead is one of them.

Part of the fix also means making all regulations consistent with the new CDC blood-lead guidelines and ensuring that clinical laboratories report all data to CDC, state, and local health authorities. Local governments must have sound systems to refer cases of poisoned children to professional licensed risk assessors to evaluate sources of exposure and mitigate them as CDC recommends.

Finally, the CDC Advisory Committee on Childhood Lead Poisoning Prevention should be restored. This was the nation's only scientific advisory group dedicated to lead poisoning prevention before it was disbanded by the CDC director in 2013.

Fund it

It has now been nearly 100 years since most countries in the world banned the use of lead in paint.[25] For the companies that refused to do so (and still refuse to this day), they should be forced to pay to help clean up the mess they have made from lead paint, lead pipes and fixtures, and soil and dust contamination. Industry must pay to help fix the problem, not just pay their lawyers to drag out court cases for decades and overturn verdicts that have held them accountable.

Investing in fixing lead hazards is economically sound, and according to the World Health Organization is slightly more cost-effective than vaccines.[26] Each dollar invested in lead paint hazard control results in a return of $17 to $221 or a net savings of $181 billion to $269 billion in the United States *for each cohort of children*.[27] The President's Task Force interagency budget request needs updating, and with it full funding to at least $230 million per year for HUD and $38 million for CDC. Such funding is a tiny fraction of the $40 billion overall HUD budget and the $11 billion overall CDC budget. Medicaid plans should reimburse for lead poisoning home visits. Research on lead is at its lowest funding level in 20 years. The National Safe and Healthy Housing Coalition[28] is working with others to make sure Congress does the right thing by funding these programs. On May 4, 2016, the nation's largest gathering of lead poisoning prevention professionals (the National Lead and Healthy Homes conference, comprised of the National Safe and Healthy Housing Coalition, the Lead and Environmental Hazards Association, and the National Association of Lead and Healthy Homes Grantees) unanimously passed a declaration calling on the President and Congress to take specific muscular action to rid the nation of lead poisoning.[28]

Conclusion: What Are Our Values?

How we respond to the continuing challenge of lead poisoning says much about us as a people. Can public health command the necessary resources? We have,

in fact, done this before. The sanitation movement at the turn of the last century relied on, among other things, a public health and housing intervention (indoor plumbing) that helped conquer cholera and other diseases. Some will focus their attention on attacking government because there are so many easy marks and it makes for great theater. But at the end of the day, if we are to restore our democracy, government is really us, and public health is one of the most important professions on which our entire population depends.

Ultimately, public health is about empowering people. As public and environmental health care professionals, and allied professions such as housing and other infrastructure professionals, we cannot remain content with just heroics (and they are indeed heroics) to make inadequately funded programs somehow work. As engineers, we cannot remain content with just issuing grades on our crumbling infrastructure. As housing professionals, we cannot be content when our nation remains in inadequate, dangerous, and unaffordable homes. Investments in public health and prevention can revitalize our economy, especially distressed communities that are typically at highest risk.

Our children are counting on us to keep them safe. We should act to give them the bright future they deserve.

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