



# **The Elephant in the (Class) Room: Effects of Lead on Learning**

**Webinar by Isles, Inc.**

**June 15, 2016**

Presented by:

Dr. Ted Lidsky, Clinical Neuropsychologist

Elyse Pivnick, MCP, Dir. of Environmental Health, Isles, Inc.

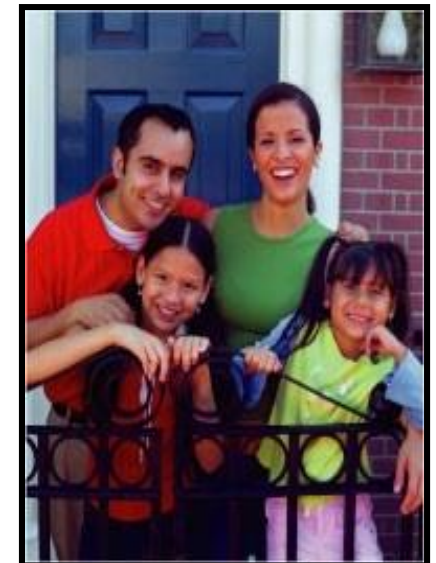
With funding from:

PSEG Foundation, the Fund for New Jersey, NJ Department of Health, Horizon Foundation of NJ, NJ Department of Human Services Division of Developmental Disabilities



# Isles' Mission

To foster self-reliant families...





# Isles' Mission

**and healthy, sustainable communities.**



# Isles' Experience with Community Health

- Tested more than 2,000 homes for hazardous lead. More than 60% had enough lead present to affect a child's IQ.
- Created the nationally-recognized ReHEET service that combines lead safety, energy efficiency and healthy homes retrofits.
- Established the NJ Healthy Homes Training Center to train community health workers, social workers, building inspectors, etc.
- Trained teams of peer educators to visit homes and identify environmental asthma triggers and conduct sampling for lead.
- Compiled data for an environmental health profile of Trenton with comparisons to county and state data.

# What's Flint have to do with NJ?

- Because of Flint MI, most of us now know lead in water can poison children.
- Flint re-opened our hearts and minds about the very old problem of lead poisoning in NJ and the nation.
- Compared data for NJ to Flint: 11 cities in NJ had a higher % of children testing high for lead in 2014 than Flint had during 2015.



# No Competition Here

- Not to take any attention or resources away from Flint, but simply highlight the thousands of children who have high levels of lead for the first time in NJ---every year.
- Let's have the same attention for our NJ children as is being given to Flint children.
- **Good to know:** High lead levels do not necessarily translate to certain education failure, but areas with high concentration of children with EBLs need more early childhood resources.





# Lead Exposure is Cumulative

- It typically comes from these main sources:



# Lead Paint in Old Housing

- FACT: Lead paint is by far the most common source of lead exposure for the US.
- Experts tell us that up to 80% of lead exposure is from lead paint. Up to 20% from drinking water.
- Exposure can also come from soil, but soil is usually the medium for lead paint, i.e., in the lot left behind after housing demolition, front and backyards, old factory sites, a part of our industrial legacy





# Lead in Water

- Thirty + school districts in NJ have found lead levels in water above the EPA standard of 15 ppb.
- A huge error of omission nationally.  
Districts allowed to use water treatment plan report instead of testing at school water taps. (Same for housing)
- We have limited information about where where leaded service lines are located --locally and nationally.



# Dangers of Lead Exposure

- In 2016, lead poisoning remains the **#1 environmental threat** to the health of America's children, as well as a health risk for people of all ages.
- Lead is so toxic that it is unsafe at any level.



Toxic

## Exposure to lead can seriously harm a child's health.



Damage to the brain  
and nervous system



Slowed growth  
and development



Learning and  
behavior problems



Hearing and  
speech problems

### **This can cause:**

- Lower IQ
- Decreased ability to pay attention
- Underperformance at school



# Lead Poisoning & School Performance

- Compromised long-term memory---for example, a student can't recall multiplication tables from one day to next
- Reduced auditory processing makes it difficult, for example, to hear the difference between “s” and “f” impeding the ability to read
- Inability to control behavior
- Inability to learn no matter how hard a child tries
- Disruption in classrooms by children frustrated by their failure to learn make it difficult for *other* children to learn.
- Lower test scores for individuals and entire school districts that have a disproportionate number of children with lead poisoning
- Disproportionate number of low-income males incarcerated, unemployed and aimless





# CDC Reference Level $\geq 5$ ug/dL

- Reflects a blood lead levels “that are much higher than most children’s levels.”  
[https://www.cdc.gov/nceh/lead/acclpp/blood\\_lead\\_levels.htm](https://www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm)
- Based on the U.S. population of children ages 1-5 years who are in the highest 2.5% of children when tested for lead in their blood.
- **Good to know:** CDC decided the nation could only, address the top 2.5% of children tested for now—a means of risk stratification.
- **Good to know:** There is no safe level of lead!

# Studies on Lead and Education

<b>4 µg/dL at 3 years of age</b>	Increased likelihood <b>learning disabled</b> classification in elementary school	More than 57,000 children	North Carolina <sup>1</sup>
	<b>Poorer performance on tests</b>	35,000 children	Connecticut <sup>2</sup>
<b>5 µg/dL</b>	<b>30% more likely to fail third grade reading and math tests</b>	More than 48,000 children	Chicago <sup>3</sup>
	More likely to be <b>non-proficient in math, science, and reading</b>	21,000 children	Detroit <sup>4</sup>
<b>Between 5-9 µg/dL</b>	Scored <b>4.5 points lower</b> on reading readiness tests	3,406 children	Rhode Island <sup>5</sup>
<b>≥10 µg/dL</b>	Scored <b>10.1 points lower</b> on reading readiness tests	3,406 children	Rhode Island <sup>5</sup>
<b>Between 10 and 19 µg/dL</b>	Significantly <b>lower academic performance test scores in 4th grade</b>	More than 3,000 children	Milwaukee <sup>6</sup>
<b>≥ 25 µg/dL</b>	<b>\$0.5 in excess annual special education and juvenile justice costs</b>	279 children	Mahoning County Ohio <sup>7</sup>

# Citations

- Miranda ML, Kim D, Reiter J, Overstreet Galeano MA, Maxson P. (2009). Environmental contributors to the achievement gap. *Neurotoxicology* 30(6):1019–1024.
- Miranda ML, Dohyeong K, Osgood C, Hastings C. (2011). The Impact of Early Childhood Lead Exposure on Educational Test Performance among Connecticut Schoolchildren, Phase 1 Report. Durham, NC: Children's Environmental Health Initiative, Duke University.
- Evens A, Hryhorczuk D, Lanphear B, Lewis D, Forst L, Rosenberg D. The Effect of Childhood Lead Exposure on School Performance in Chicago Public Schools. Forthcoming work. Chicago, IL: University of Illinois at Chicago.22. U.S. Department of Education. 34 CFR Parts 300 and 301. Assistance to States for the Education of Children with Disabilities and Preschool Grants for Children with Disabilities. [Accessed 2012 June 4] Available from: <http://idea.ed.gov/download/finalregulations.pdf>.
- Zhang N, Baker HW, Tufts M, Raymond RE, Salihu H, Elliott MR. (2013). Early childhood lead exposure and academic achievement: evidence from Detroit public schools, 2008–2010. *American Journal of Public Health* 113:e72–e77.
- McLaine P, Navas-Acien A, Lee R, Simon P, Diener-West M, Agnew J. (2013). Elevated blood lead levels and reading readiness at the start of kindergarten. *Pediatrics* 131:1081–1089.
- Amato M, Moore CF, Magzamen S, Imm P, Havlena JA, Anderson HA, Kanarek MS. (2012). Lead exposure and educational proficiency: moderate lead exposure and educational proficiency on end-of-grade examinations. *Annals of Epidemiology* 22:738–743.
- Stefanak M, Diorio J and Frisch L. (2005) Costs of child lead poisoning to taxpayers in Mahoning County, Ohio. *Public Health Reports* 120:311-315.

# Didn't we solve this problem in the 1970's?

- In the 1970's, we removed lead from gasoline and new paint.
- National rates of high lead levels have been significantly reduced since then
- Hides the harsh fact that low-income minority children in our cities continue to be disproportionately exposed to lead, and are 2-4 X more likely to have a high lead level compared to most suburban children.





# Still with us, but off the radar

- In 2015, more than 3,000 children in New Jersey lead level of 5 or greater for the first time
- About 225,000 young kids in New Jersey have been poisoned by lead since 2000.
- Lead-poisoned children are **seven times** more likely to drop out of school and **six times** more likely to become involved in the juvenile justice system.
- Forgotten in child development and education reform- My Brothers Keeper



# 11 NJ Cities

## COMPARISON OF ELEVATED BLOOD LEAD LEVELS: NJ Selected Cities/Counties and Flint MI

% of children tested , < 6 years , with EBLLs  $\geq$  5mg/dL by selected jurisdiction

<http://www.state.nj.us/health/fhs/documents/childhoodlead2014.pdf>

\*latest available data

	Total children**	% tested	total # tested	# $\geq$ 5 mg/dL	% $\geq$ 5mg.dL
<b>NJ jurisdiction 2014*</b>					
Atlantic city	3677	47.3	1738	177	10.2
Salem Co	1549	14.8	685	61	8.9
Irvington	4993	54.2	2705	229	8.4
not specified			23356	1984	8.4
E orange	5543	34.3	1896	147	7.7
Trenton	7998	42.8	3421	214	6.3
Newark	24831	56.5	14030	800	5.7
Paterson	13987	45.8	6407	310	4.8
Plainfield	4961	56.5	2802	127	4.5
Cumberland Co	4368	23.3	3021	129	4.2
Jersey City	20393	42.2	8605	347	4
Elizabeth	11792	41.7	4921	195	3.9
New Brunswick	4753	36.8	1747	64	3.6
Passaic	8226	53.9	4433	163	3.6

<b>Flint MI 2015</b>	8657	38.6	3339	112	3.3
----------------------	------	------	------	-----	-----

[www.mi.gov/flintwater](http://www.mi.gov/flintwater)

# NJ Childhood Lead Levels

	Cumulative *	Cumulative*	Annual rate**
	% with BLL ≥2.5 ug/dL	% with BLL ≥5 ug/dL	% with BLL ≥5 ug/dL
<b>Camden</b>			
2012-13	42.4	13.2	5.6
2011-12	55.5	17.9	7.8
<b>Irvington</b>			
2012-13	64.9	19.6	11.1
2011-12	73.1	28	12.6
<b>New Brunswick</b>			
2012-13	48.8	10.6	4.6
2011-12	62.2	16.8	n/a
<b>Newark</b>			
2012-13	53.9	14.1	6.4
2011-12	61.6	16.9	8.3
<b>Trenton</b>			
2012-13	51	15.1	6.4
2011-12	63	23	7.6

% children starting K from all tests, ages 0 -6, compared to single year.

## SOURCES

\* Data provided to isles by NJ DOH -- single highest level per child.

\*\*<http://www.state.nj.us/health/fhs/documents/childhoodlead2012.pdf>

\*\*<http://www.state.nj.us/health/fhs/documents/childhoodlead2013.pdf>

# Cost of Lead Hazards Continues to be Immense

- What is strangely misunderstood is the costs of lead poisoning are primarily borne outside the health sector in:
  1. Social and economic costs of special education,
  2. Classroom disruption by children failing to learn
  3. Disproportionate incarceration of young minority men
  4. Family stress
  5. Life-long disability payments
  6. Forfeited tax revenues for adults who cannot work
  7. Adult health problems





# Prevention, Prevention, Prevention

- Over the last decades, **treatment**, has been the guiding paradigm for lead poisoning policy
- Beacon to guide future policies must be to **prevent** lead poisoning in the first place.
- Use children as lead detectors, and then go into the house to see if you can remove hazardous conditions
- If lead levels are 40 ug/dL or higher, there can be medical intervention for child, but otherwise no treatment available.

# What Can Be Done?

- Better define the problem--map data!
- Public policy—local, state and federal
- Lead safe certificates for rental units
- Housing rehabilitation
- Consumer education
- Professional education
- Involve educators



# Federal Policies



- Restore HUD funding back to \$230M /yr from current \$110M. (Senate approved an increase to \$135M, House Appropriations to \$130M.)
- Full Disclosure about lead in home at time of sale. No more “I Don’t Know.” (Sen. Menendez bill)
- Bring HUD regulations to be consistent with CDC reference level of  $\Rightarrow$  5ug/dL (Bill pending)



# State Policies



1. Require landlords obtain Lead safe certificates before units can be rented state wide- including Section 8 and public housing;
  - a. Aizer and Currie study:  
[http://economics.yale.edu/sites/default/files/aizer\\_feb\\_12\\_2015.pdf](http://economics.yale.edu/sites/default/files/aizer_feb_12_2015.pdf)
2. Lead disclosure at time of sale
3. Require submittal lead screening levels at school entry
4. Support partnerships between CHWs and housing inspection services
5. Testing drinking water—everywhere!
6. Test playgrounds and soils where children play
7. Change the NJ action level for lead poisoning from >10mg/dl to >5mg/dl. (**DONE!**)

# Local Public Policy



1. Enforce housing codes
2. Landlords to obtain lead safe certificates before renting units- including water testing
3. Housing inspections on demand
4. Require housing inspectors to train in the seven principles of healthy homes
5. Create local healthy homes advisory groups
6. Seek funding for home repairs



# Education Interventions: What Works?

- While no studies specifically examine the impact of early childhood interventions on education success of children with high lead levels—we are trying to change this—
- Multiple studies show the early education intervention for other known developmental disabilities demonstrate that children benefit most from interventions applied at an early age.(Glasco, 2000; Campbell et al., 2001; Anderson et al., 2003)
- Communicate with health and other social service providers about education needs of children affected by lead.

# Education Interventions (cont'd)

- Require lead screening levels be submitted at time of school entry.—preschool and K  
Typically, educators do not have this information.
- Develop and deliver educator training so they can identify lead related disabilities and behaviors that impede educational success
- Collaborate with parents, Mayor, housing inspectors, CHWs
- Use Child Find processes to identify and refer children with high lead as early as possible to services of the IDEA (Individuals with disabilities education improvement) parts B (preschool special education) or C (birth to age 3)



# Education Interventions (cont'd)

- Expand NJ IDEA to formally meet the needs of lead exposed kids
- Request that child health professionals inform Child Find of children with BLL > reference level/or inform parents of Child Find
- Classify the developmental deficits associated with BLLs  $\geq$  5 as qualifying for Part C services
- Consider neuropsychological assessments of executive function and other domains to identify deficits early.

# Education interventions (cont'd)

- Appoint a staff to review forms and refer children who should receive services to the right programs.
- Obtain census tract information to identify where children with high lead levels reside
- Presume eligibility for a child with  $BLL \geq 5$  since some lead symptoms do not manifest until later years.
- Referral of identified students for enrichment opportunities.
- When indicated, referral for an evaluation to determine eligibility for special education or other accommodations /modifications under section 504

# Need for Research



# Housing Rehab and Repair

- Restore \$10M LHCAF (DONE!!)
- Fund comprehensive lead, healthy homes and repair projects, weatherization programs like ReHEET.
- Train other community organizations to provide comprehensive services. More nimble; less expensive
- Make funds available to cities to make lead safe repairs.



# Consumer Education to Help Residents

- Statewide communication campaign to help residents understand current findings about lead and how to protect their families.
- Provide education about lead and healthy homes issues in all health care and community settings where young children and families are present.
- Provide lead testing of homes before children can be exposed





# Professional Education of Home Visitors

- Train social workers and other home visitors as Community Health Workers.
- Train Energy Auditors as “Healthy Home Evaluators”
- Train all Building Inspectors in “Code Inspection for Healthier Home” course.
- Make the EPA Lead RRP course mandatory for contractors to get or renew business license.



# Find it, Fix it, Fund it

- National Center for Healthy Housing (NCHH) campaign launched last month.
- <http://www.nchh.org/Policy/FindItFixItFundIt.aspx>
- Create local lead and healthy homes advisory groups
- Participate in NJ lead and healthy homes advisory group

# NYT Quote of the Day

“If you were going to put something in a population to keep them down for generations to come, it would be lead.”

(NYT January 30, 2016)

Dr. Mona Hanna-Attisha, of Flint MI, who has studied lead poisoning and the effects of lead exposure, for which there is no cure.

# Services Offered by Isles

## **Professional training for home visitors**

- Healthy Homes for Community Health Workers
- Essentials for Healthy Homes Practitioners
- Code Inspection for Healthier Homes
- EPA Renovation, Repair and Painting
- Healthy Homes Evaluator (NEW!)

## **Community presentations on lead and healthy homes**

- 7 Keys to a Healthy Home
- Eco-Healthy Child Care

## **Technical assistance to community organizations and governments**

- Comprehensive lead, energy and healthy homes programs

# Resources

- [https://www.cdc.gov/nceh/lead/publications/educational\\_interventions\\_children\\_affected\\_by\\_lead.pdf](https://www.cdc.gov/nceh/lead/publications/educational_interventions_children_affected_by_lead.pdf)
- [http://www.nchh.org/Portals/0/Contents/Childhood\\_Lead\\_Exposure.pdf](http://www.nchh.org/Portals/0/Contents/Childhood_Lead_Exposure.pdf)
- [http://nchh.org/Portals/0/Contents/lead%20strategies\\_v8%20\(19%20October%202014\).pdf](http://nchh.org/Portals/0/Contents/lead%20strategies_v8%20(19%20October%202014).pdf)
- Special thanks to Mary Jean Brown, Chief of CDC's Lead Poisoning Prevention Branch, Center for Disease Control and Prevention

# Contact Us

Ted Lidsky: [tlidsky@yahoo.com](mailto:tlidsky@yahoo.com)

Elyse Pivnick: [epivnick@isles.org](mailto:epivnick@isles.org)

## Find Us Online



[www.isles.org](http://www.isles.org)



@islesinc



facebook.com/islesinc

**isles**  
*Self-Reliant Communities*