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CHILDREN'S HOSPITAL

Welcome to the 2015 Upstate New York Lead Conference

Collaboration to Overcome Lead Poisoning

MEDICINE *of* THE HIGHEST ORDER

Main Sponsor

Our thanks go to the



and its Wilson Community Pediatric Fund for making this conference possible

Other Sponsoring Organizations

Western New York Lead Poisoning Resource Center

Coalition to Prevent Lead Poisoning

Finger Lakes Coalition to Stop Lead Poisoning

Finger Lakes Children's Environmental Health Center

Format of the Conference

Morning Presentations

Workshops During Afternoon Breakout Sessions

Where Do We Go From Here? – The Road Forward

An Expert Panel

4

Lead Poisoning: How Close Are We To Declaring Victory?

Stanley J. Schaffer, M.D.

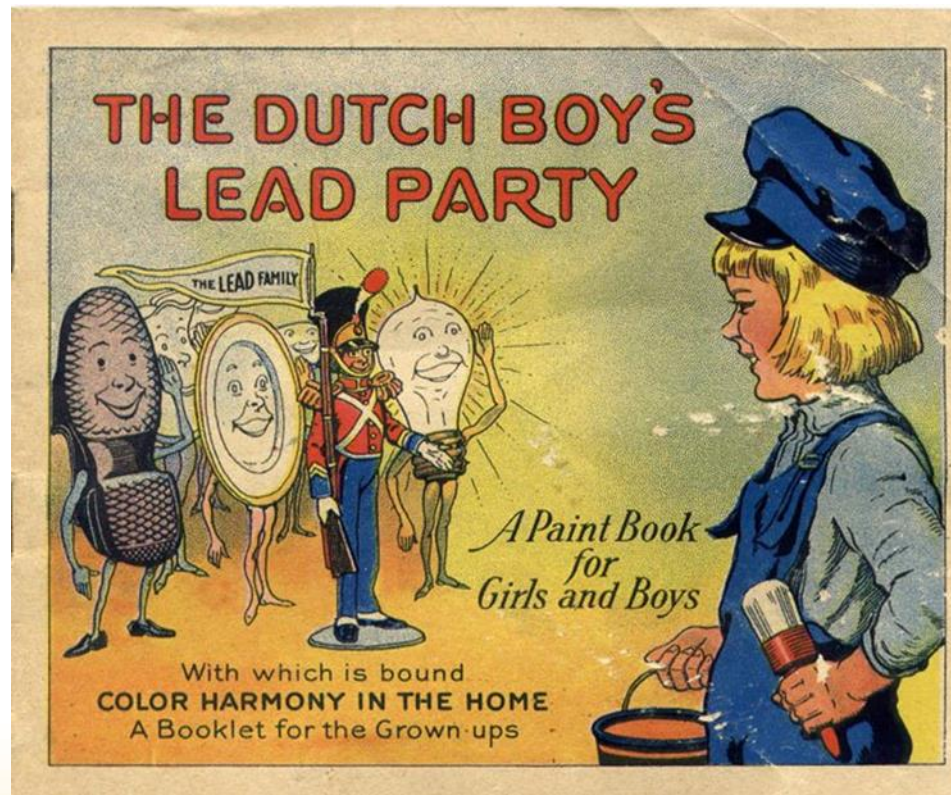
WNY Lead Poisoning Resource Center

Lead Poisoning – How Far Have We Come?

Lead is noted to be harmful by the early 1920s

1922 – European countries ban lead in household paint

In the US:



1923 Coloring Book

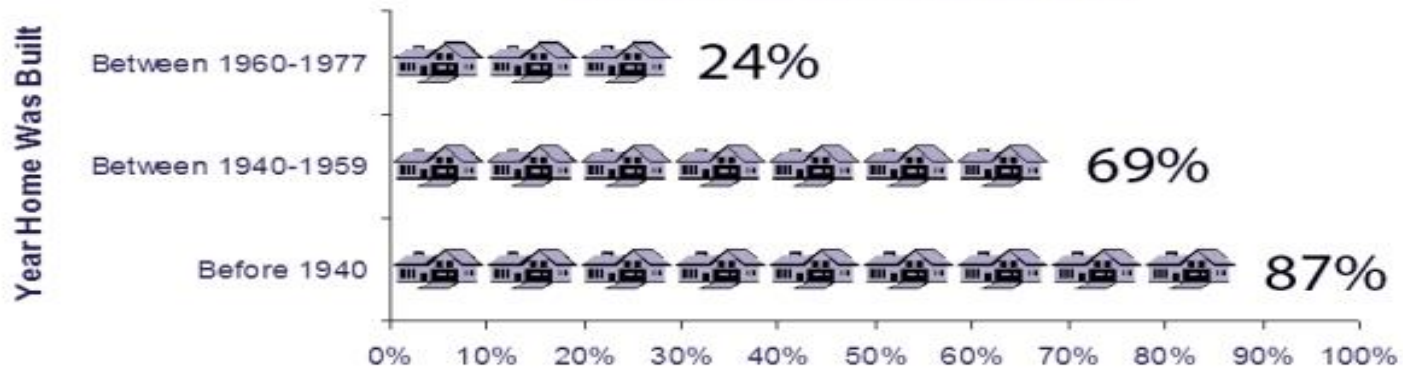
A Timeline of Important National Milestones in Addressing Lead Exposure Over the Past 30-40 Years

- 1974 – Unleaded gasoline goes on sale and phase out of leaded fuel begins; catalytic convertor required in all vehicles
- 1978 – Sale of household paint containing lead banned
- 1980 – Most vehicles have transitioned to unleaded fuel
- 1985 – CDC lowers blood lead level of concern to 25 mcg/dL
- 1988 – Leaded gasoline no longer sold
- 1991 – CDC lowers blood lead level of concern to 10 mcg/dL sparking new interest in the problem of lead
- 2003 – Rochester Lead Study shows that blood lead levels < 10 mcg/dL can cause cognitive problems, spurring on additional research
- 2012 – CDC renames the 'blood lead level of concern' the 'reference level' and sets it at 5 mcg/dL

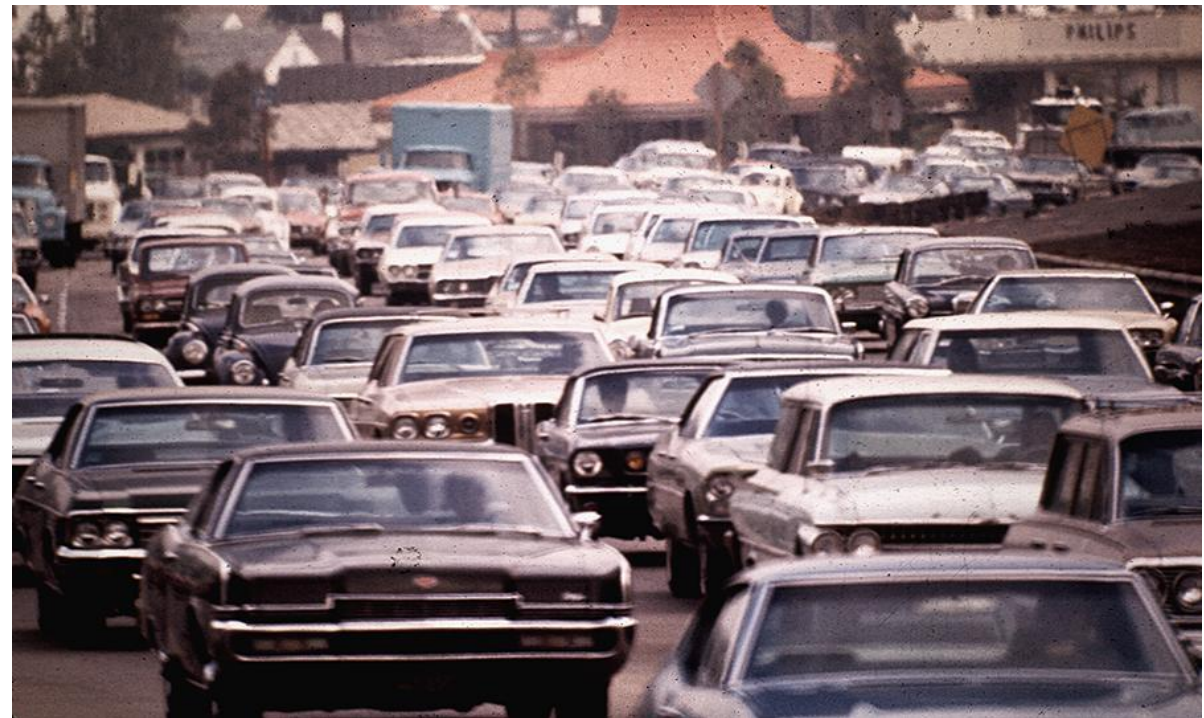
The Legacy of Lead in Paint



Older Homes are More Likely to Contain Lead-Based Paint

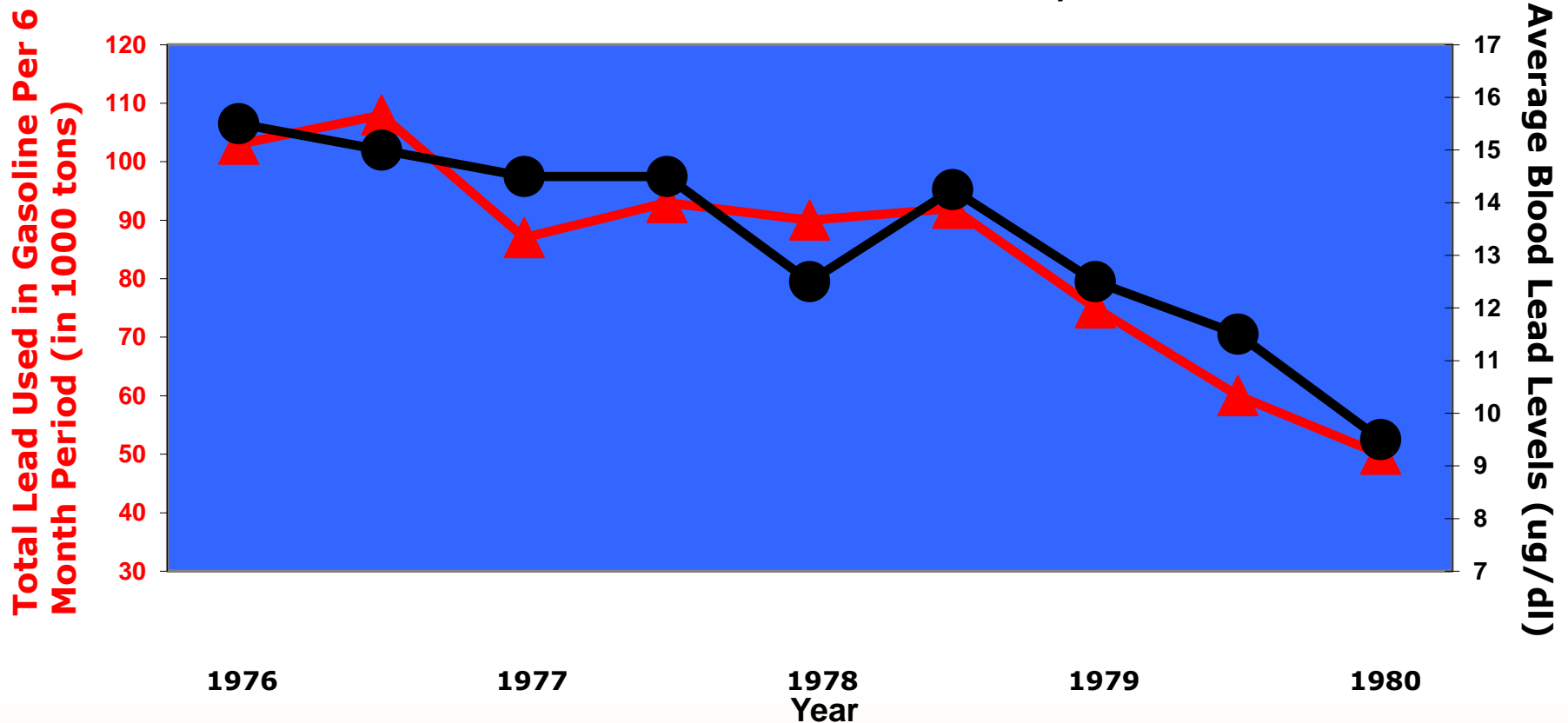


It Wasn't Only Paint Though: Gasoline as a Source of Air Lead



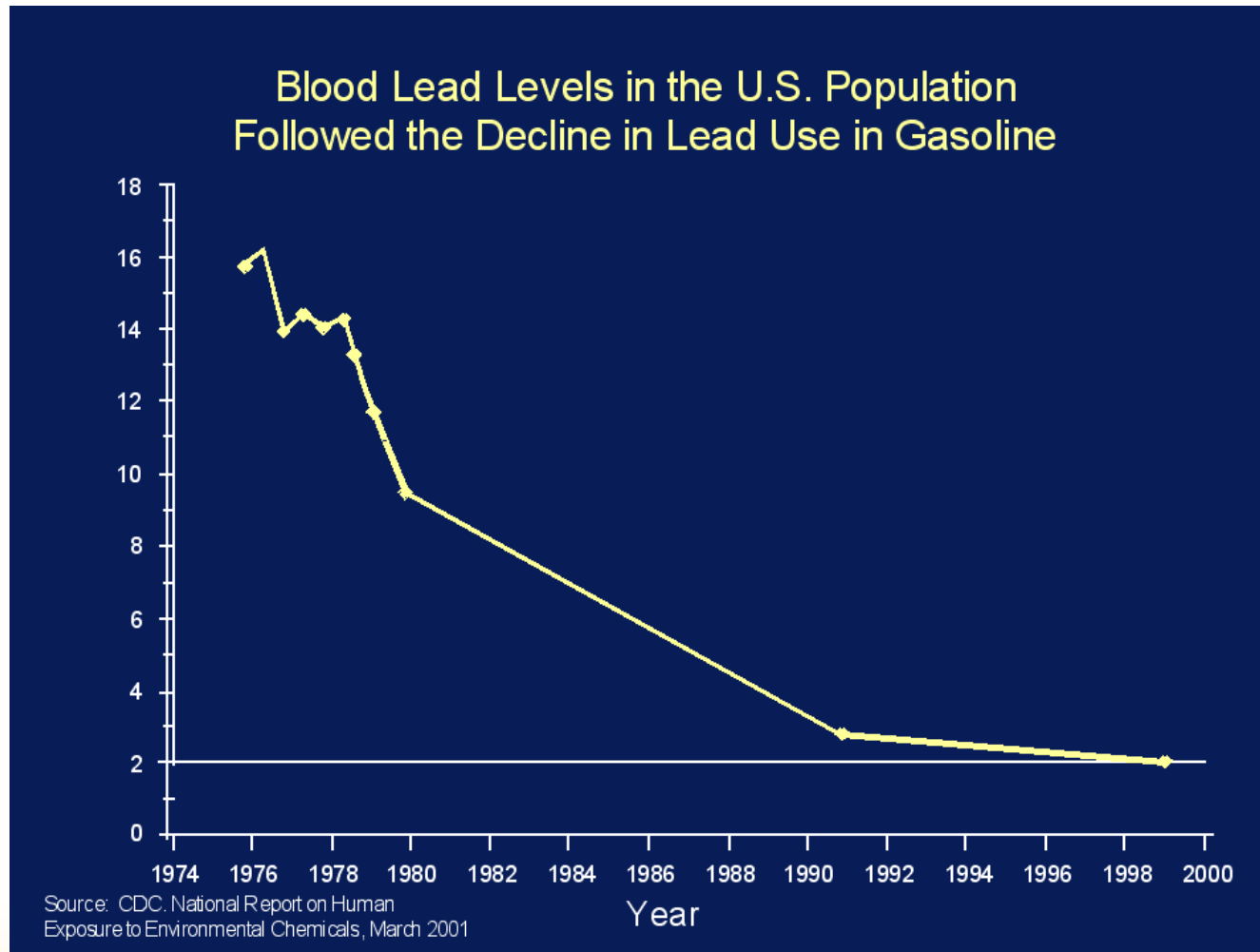
The Effect of Removing Lead From Gasoline

Change in Blood Lead Levels in Relation to a Decline in Use of Leaded Gasoline in the U.S., 1976-1980



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A Graphic View of the Long-term Effect of Taking Lead Out of Gasoline



Since the Major Sources of Lead Exposure Have Been Addressed, Are We Ready to Declare Victory?

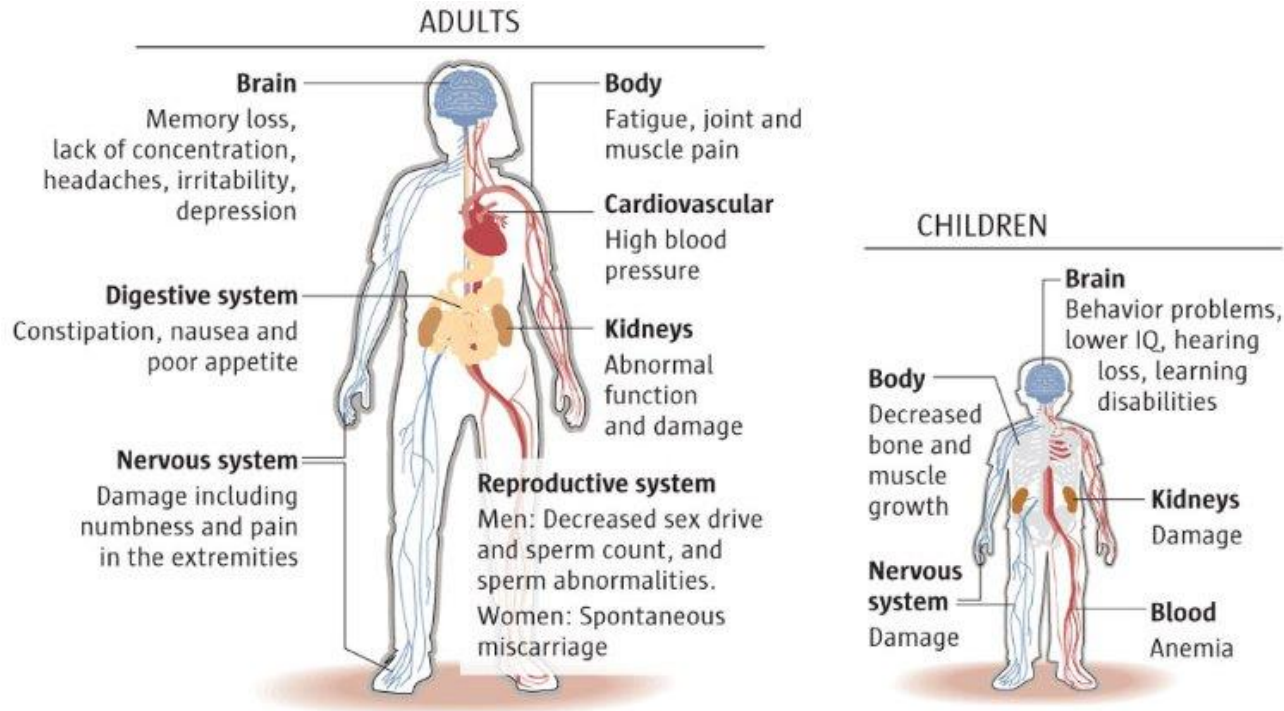


Other Sources

- Lead-containing dust trekked or blown into homes
- Stationery industrial sources and airports
- Contaminated soil
- Water contaminated by lead pipes or lead solder
- Imported foods and cosmetics
- Jewelry containing lead
- Toys containing lead

Two Important Considerations Concerning Lead

The effects of lead are sustained throughout life



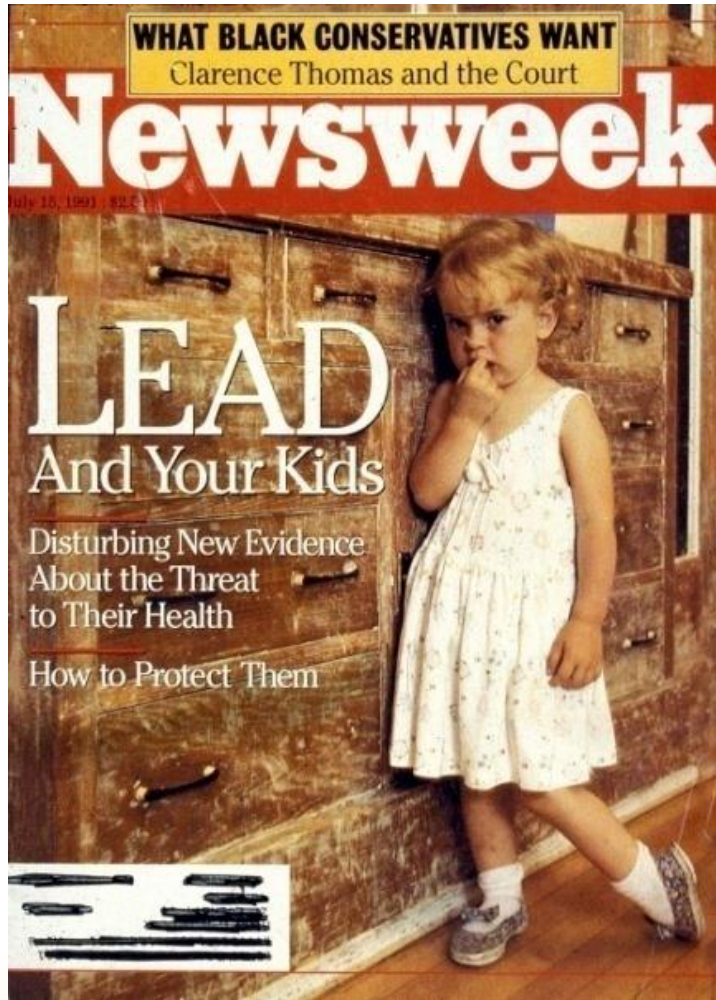
It is easy not to consider lead exposure as the cause of chronic medical conditions because of its subtle health and behavioral effects at most blood levels

Lifelong Effects of Lead

Even if we were to get rid of lead today, there would be many people with lifelong issues related to their previous lead exposure:

- Learning problems
- Attention problems & difficulty concentrating leading to poor school performance, behavior problems, lost learning potential, high dropout and unemployment rates
- Issues with anger & coping with frustration, delinquency, anti-social behavior
- Transmission of lead from a woman to her fetus or breastfeeding child
- Hypertension
- Bone fractures in post-menopausal women

Interest in Lead Poisoning Renewed When the CDC's Blood Lead Level of Concern Was Lowered to 10mcg/dL



- Lead exposure mostly targets low socioeconomic status inner city minority populations, especially children
- Lead exposure has affected multiple generations in these populations
- Increased knowledge about the harm caused by lead

The Rochester Lead Study

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

APRIL 17, 2003

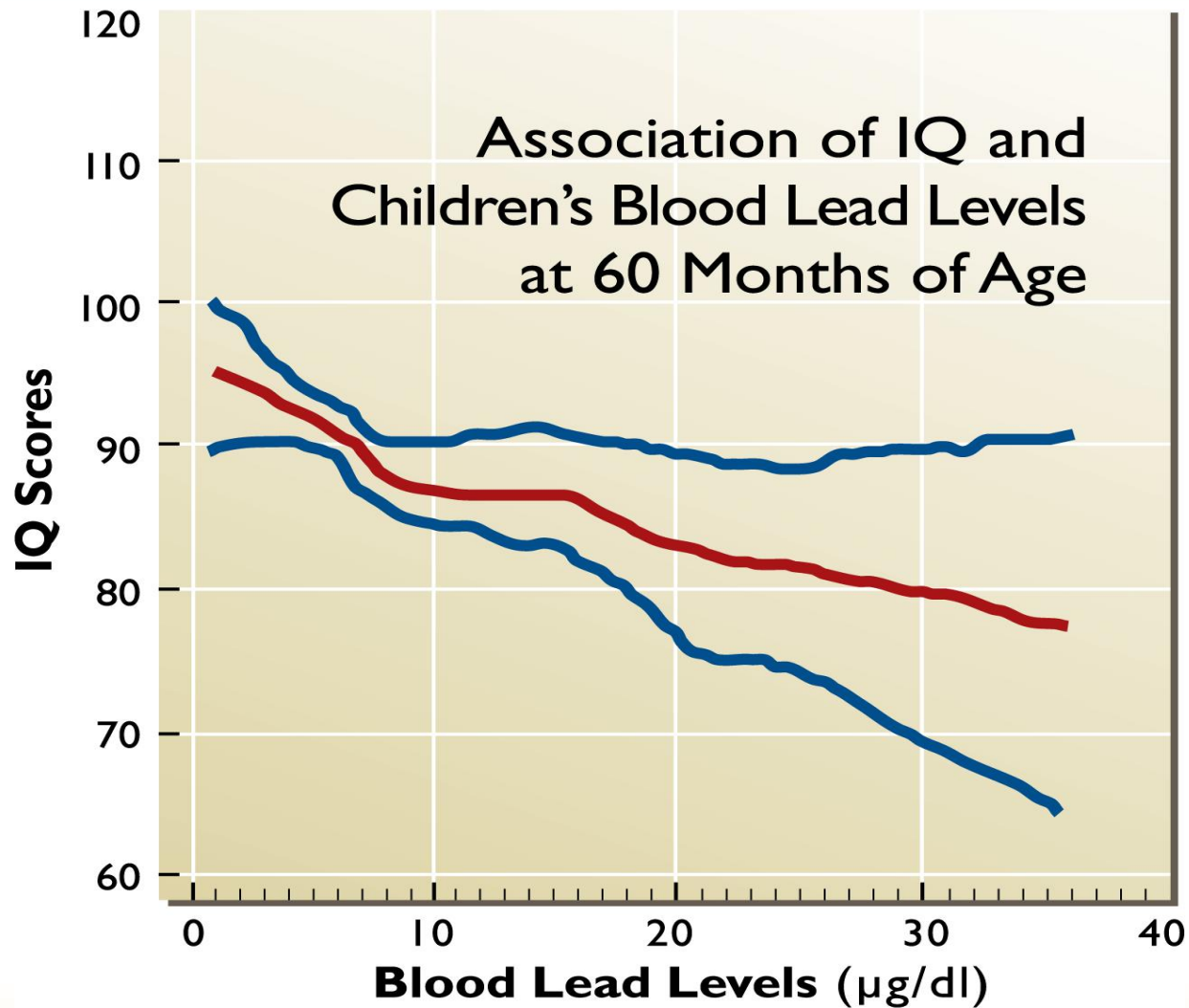
VOL. 348 NO. 16

Intellectual Impairment in Children with Blood Lead Concentrations below 10 μg per Deciliter

Richard L. Canfield, Ph.D., Charles R. Henderson, Jr., M.A.,
Deborah A. Cory-Slechta, Ph.D., Christopher Cox, Ph.D., Todd A. Jusko, B.S.,
and Bruce P. Lanphear, M.D., M.P.H.



The Effects of Low-Level Lead Exposure on IQ in Young Children



From Canfield RL, et al. *NEJM*. 2003;348:1517-1526

Neurobiological Mechanisms: the Mesocorticolimbic Dopamine (DA) System as a Target of Lead

- Mesocorticolimbic system:
 - ◆ Learning, executive function, attention deficit, schizophrenia, reward, addiction

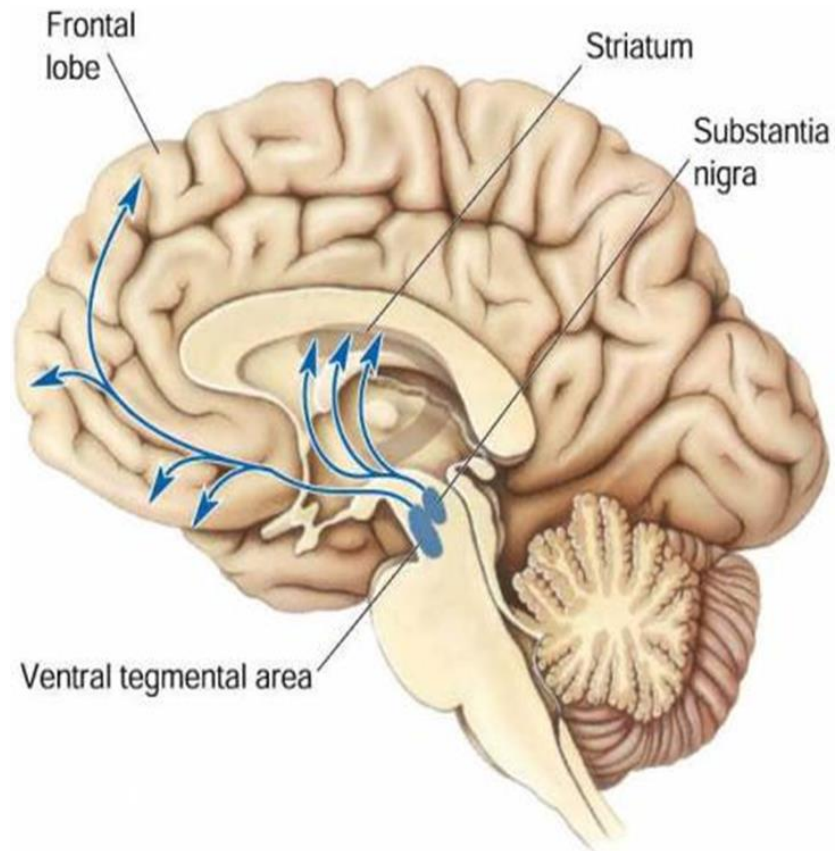


Illustration courtesy of Dr. Deborah Cory-Slechta

Lead and ADHD

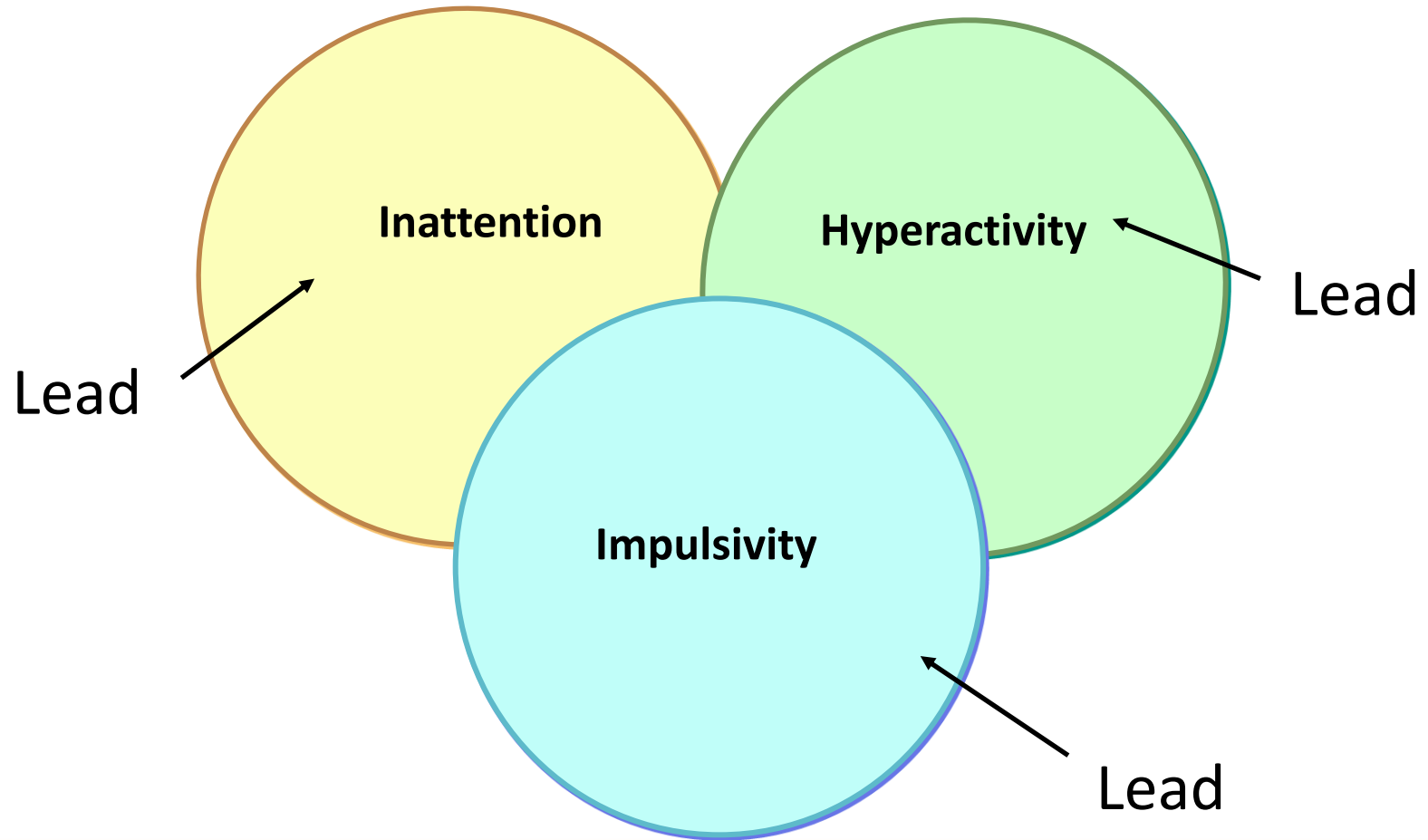


Illustration courtesy of Dr. Deborah Cory-Slechta

Auditory Processing Disorders

Auditory Processing Affects Learning

Spelling

Sound discrimination
Auditory memory
Apply sound/symbol relationship

Reading

Classify words by similarities
Combine sounds to make words
Integrate the spoken and written word

Note taking

Take notes from a lecture
Understand lectures
Apply what you have heard

Listening

Classify and associate information
Comprehend oral information
Build factual knowledge

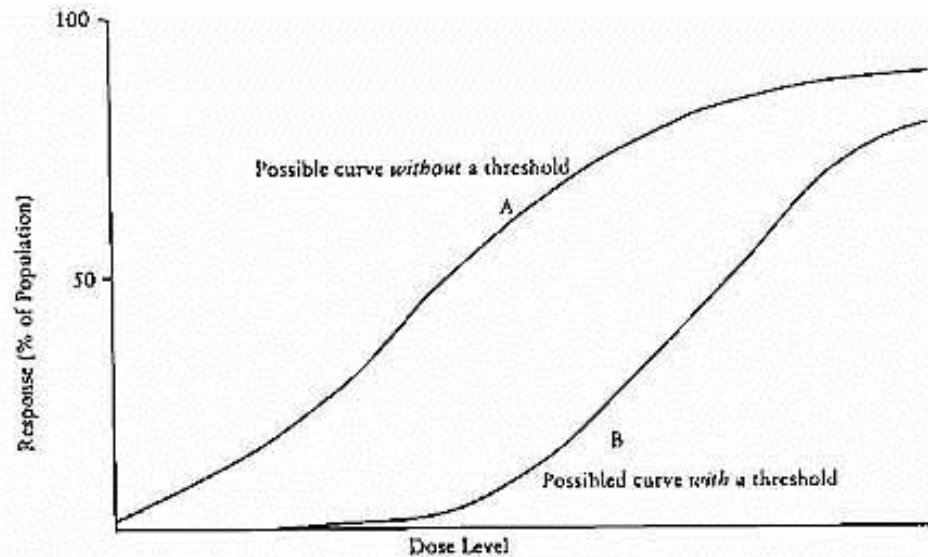
Speech

Speak clearly
Classify and associate information
Comprehend oral information

Attention

Pay attention when distractions are present
Follow conversations
Follow directions

What Do We Now Know About Lead Poisoning?

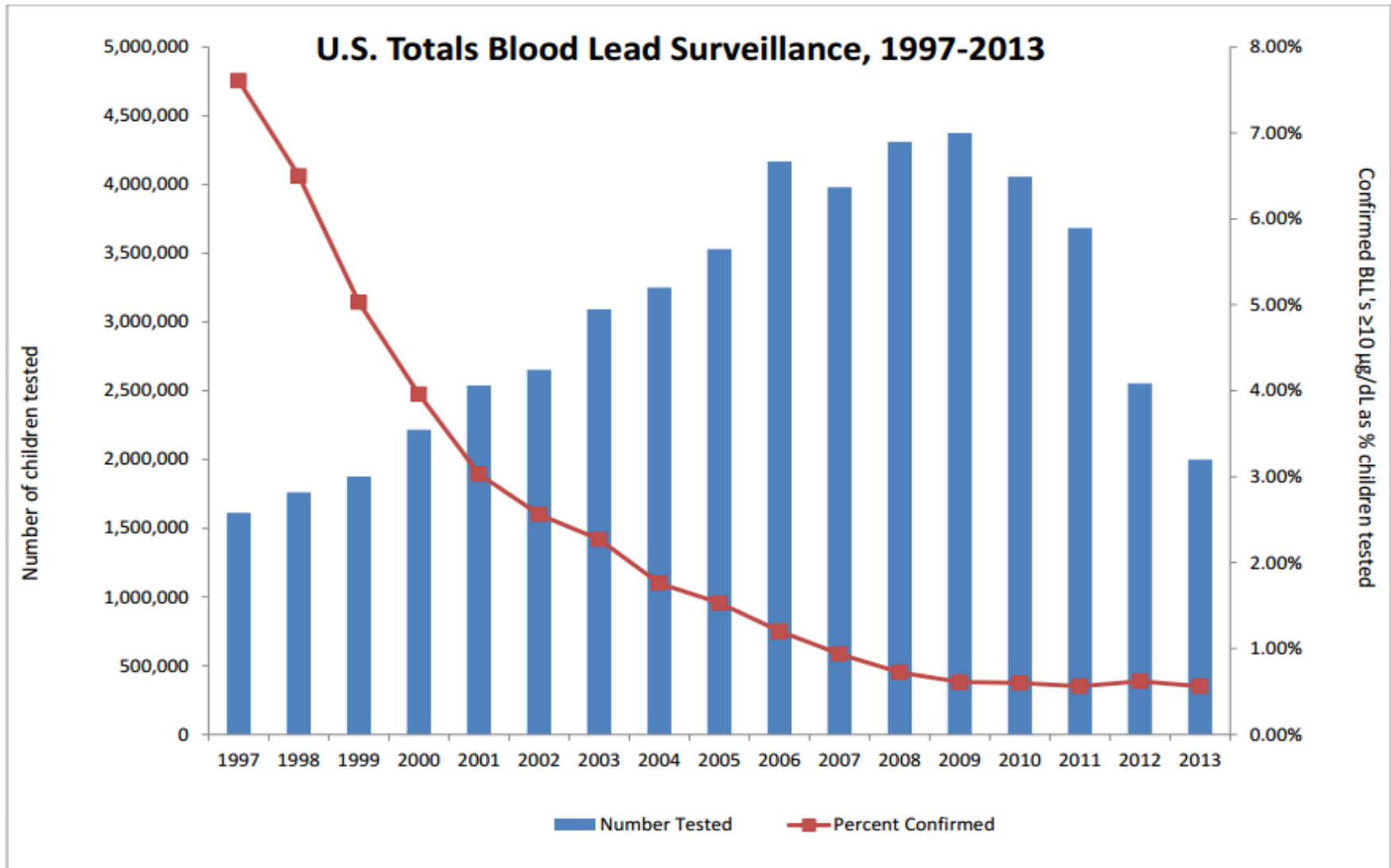


- Unlike most toxins, there is no threshold exposure level below which the adverse effects of lead are not seen
- Even at very low levels, lead can cause harm, particularly for young children whose brains are developing
- The effect of lead is much more pronounced on males than on females

National Trends

What are the trends that we have seen nationally over the past 20 years?

Trends in Blood Lead Testing & Prevalence of Elevated Blood Lead Levels



Source: Centers for Disease Control and Prevention

The Rochester and Monroe County Experience

A collaborative community approach to dealing with
lead poisoning

Local Successes Due to Collaboratively Dealing with Lead Poisoning

Declines in Elevated Blood Lead Levels Among Children, 1997–2011

Byron S. Kennedy, MD, PhD, MPH, Andrew S. Doniger, MD, MPH, Susan Painting, BS, Lee Houston, BS, Michael Slaunwhite, BS, Frank Mirabella, BS, John Felsen, MPH, Paul Hunt, BS, Dawn Hyde, BS, Earl Stich, BS

Background: Early childhood lead exposure is associated with numerous adverse health effects. Eliminating blood lead poisoning is a national health objective for 2020.

Objective: To assess temporal trends in childhood elevated blood lead level (EBLL) rates.

Methods: Laboratory surveillance data were collected from 1997 to 2011 and analyzed in 2013 using linear regression to assess trends in confirmed EBLL rates among children aged <6 years in the U.S., New York State ([NYS], excluding New York City), and Monroe County NY. Monroe County was also examined as a case study of local public health efforts to reduce childhood lead exposures. Blood lead screening and home lead hazard inspection data were collected from 1990 to 2012 and analyzed in 2013.

Results: The prevalence of $EBLL \geq 10 \mu\text{g/dL}$ per 100 tested children decreased from 13.4 to 1.1 in Monroe County, 6.3 to 1.0 in NYS, and 7.6 to 0.6 in the U.S. between 1997 and 2011. The absolute yearly rate of decline in Monroe County (slope = -0.0083 , $p < 0.001$) occurred 2.4-fold faster than that in NYS (slope = -0.0034 , $p < 0.001$) and 1.8-fold faster than that in the U.S. (slope = -0.0046 , $p < 0.001$). The childhood blood lead testing rate was consistently higher in Monroe County than in NYS and the U.S.; however, testing increased for all three areas (all slopes > 0 , $p < 0.05$), with greater improvements observed for U.S. children overall (slope = 0.0075 , $p < 0.001$).

Conclusions: In addition to national and statewide policies, local efforts may be important drivers of population-based declines in childhood EBLL rates.

(Am J Prev Med 2014;46(3):259–264) © 2014 American Journal of Preventive Medicine

Local Successes Due to Collaboratively Dealing with Lead Poisoning

Results: The prevalence of EBL ≥ 10 $\mu\text{g}/\text{dL}$ per 100 tested children decreased from 13.4 to 1.1 in Monroe County, 6.3 to 1.0 in NYS, and 7.6 to 0.6 in the U.S. between 1997 and 2011. The absolute yearly rate of decline in Monroe County (slope= -0.0083 , $p < 0.001$) occurred 2.4-fold faster than that in NYS (slope= -0.0034 , $p < 0.001$) and 1.8-fold faster than that in the U.S. (slope= -0.0046 , $p < 0.001$). The childhood blood lead testing rate was consistently higher in Monroe County than in NYS and the U.S.; however, testing increased for all three areas (all slopes > 0 , $p < 0.05$), with greater improvements observed for U.S. children overall (slope= 0.0075 , $p < 0.001$).

Rates of Children with BLLs ≥ 10 mcg/dL in Monroe County, New York State and the U.S. Over Time

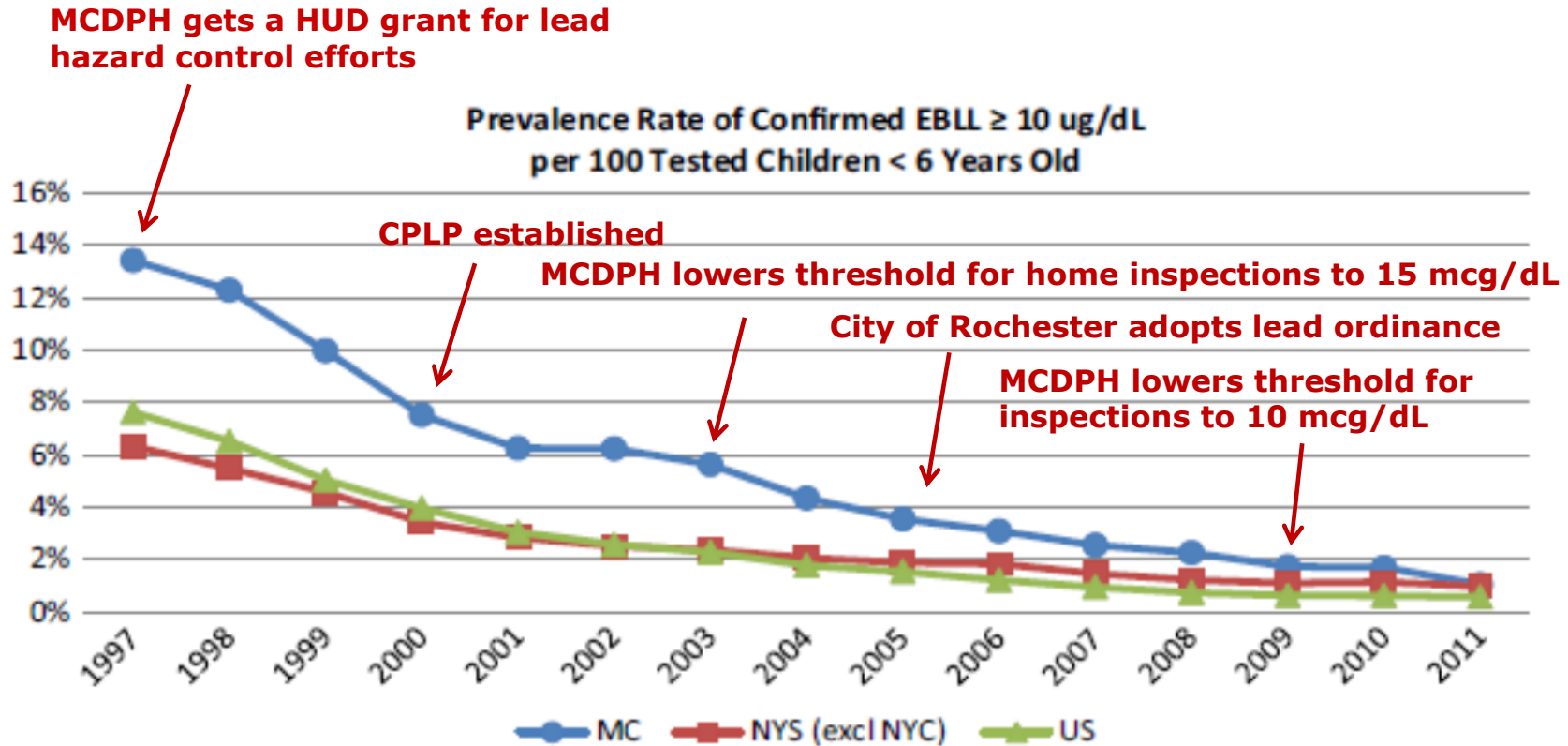


Figure 1. Trends in childhood elevated blood lead levels, 1997–2011

EBLL, elevated blood lead level; MC, Monroe County; NYS (excl NYC), New York State (excluding New York City)

Understanding the Factors Contributing to Lead Poisoning in Rochester

- Old housing stock
- High poverty rate
- Low property values (mean \$53,000)
- Poor housing conditions
- High rates of rental housing in poor neighborhoods (~85%)
- Highly mobile impoverished population with few resources

The Coalition to Prevent Lead Poisoning



Established in 2000

Monthly Standing Committee Meetings:

- Government Relations Committee
- Screening & Professional Education Committee

Determination to Overcome the Silo Effect



Accepting the Idea That Lead Poisoning is Everyone's Problem

Medical providers: *"It's a housing problem"*

Social service providers: *"It's a medical problem"*

Educators: *"It's a social problem"*

The fact is that it's everyone's problem and we call have to work collaboratively in order to deal with the problem effectively

Organizations Having Ongoing Collaboration With the Coalition to Prevent Lead Poisoning



roberts
communications



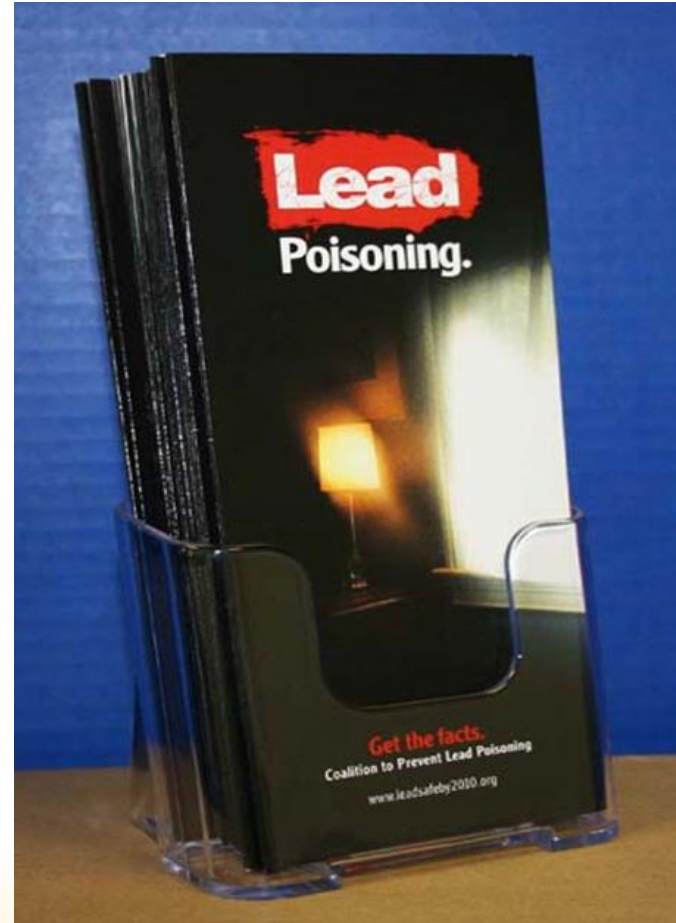
Western New York Lead Poisoning Resource Center – Rochester Office

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Efforts to Increase Awareness Among the General Public

- Newspaper articles
- Ads in publications, on billboards
- TV and radio shows
- Pamphlets (in 8 languages)
- Neighborhood outreach
- DVDs available at libraries
- Web page (letsmakeleadhistory.org)



Community Action Can Increase Awareness About Testing for Lead



Call 585-256-2267

www.lead-safe-by-2010.org



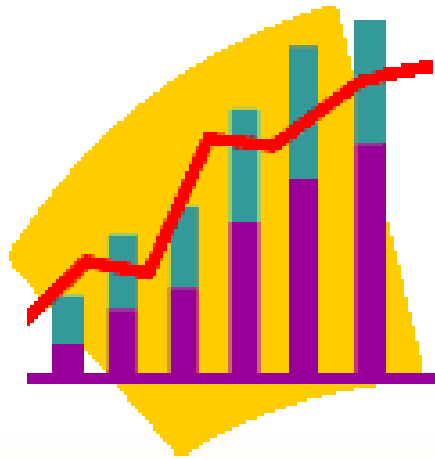
Data Collection and Dissemination by MCDPH

Blood Lead Screening Data 2001-2013 (Children <= 6.00 years at time of screen)														
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
<u>Total County</u>														
# Screened	13,259	13,537	13,708	13,746	13,624	14,561	14,917	14,114	13,778	12,447	14,055	13,263	13,607	
# Screened 5-9 µg/dl													689	
% Screened 5-9 µg/dl													5.06%	
# Screened >= 10 µg/dl	1,179	1,234	1,019	900	675	571	426	363	283	290	222	182	197	
% Screened >= 10 µg/dl	8.9%	9.1%	7.4%	6.50%	4.95%	3.92%	2.86%	2.57%	2.05%	2.33%	1.58%	1.37%	1.45%	
# with confirmatory lead levels >=15 µg/dl										45	39	47	32	
% confirmed >= 15 µg/dl										0.36%	0.28%	0.35%	0.24%	
# with confirmatory lead levels >=20 µg/dl	89	112	83	57	47	49	29	32	30	13	19	18	15	
% confirmed >= 20 µg/dl	0.67%	0.83%	0.61%	0.41%	0.34%	0.34%	0.19%	0.23%	0.22%	0.10%	0.14%	0.14%	0.11%	
Children Screened with No Address	889	400	288	92		35	63	82	156	103	69	76	44	
Percent of Children with No Address	6.70%	2.95%	2.10%	0.67%		0.24%	0.42%	0.58%	1.13%	0.83%	0.49%	0.57%	0.32%	
<u>City and Combined City/Suburban Zip Codes*</u>														
# Screened	8,137	8,682	8,805	8,469	8,226	9,206	8,533	8,369	7,780	7,327	7,400	6,757	7,112	
% of total screens	61.37%	64.14%	64.23%	61.61%	60.38%	63.22%	57.20%	59.30%	56.47%	58.87%	52.65%	50.95%	52.27%	
# Screened 5-9 µg/dl													616	
% Screened 5-9 µg/dl													8.66%	
# Screened >= 10 µg/dl	1,096	1,136	950	843	621	553	390	322	249	268	185	158	174	
% Screened >= 10 µg/dl	13.5%	13.1%	10.8%	9.95%	7.55%	6.07%	4.57%	3.85%	3.20%	3.66%	2.50%	2.34%	2.45%	
# with confirmatory lead levels >= 15 µg/dl										44	37	46	31	
% confirmed >= 15 µg/dl										0.60%	0.50%	0.68%	0.44%	
# with confirmatory lead levels >= 20 µg/dl	87	104	76	55	45	46	26	31	27	13	18	17	14	
% confirmed >= 20 µg/dl	1.07%	1.20%	0.86%	0.65%	0.55%	0.32%	0.30%	0.37%	0.35%	0.18%	0.24%	0.25%	0.20%	
<u>City and Combined City/Suburban Zip Codes*</u>														
#Screened who are 1 & 2 yr olds	4,701	5,155	5,155	5,050	5,048	5,235	5,104	5,252	5,462	5,131	5,507	5,072	5,322	
%Screened who are 1 & 2 yr olds	57.8%	59.4%	58.5%	59.60%	61.37%	56.87%	59.81%	62.76%	70.20%	70.00%	74.42%	75.06%	74.83%	

* City and Combined City/Suburban Zip Codes (formerly labeled as High Risk) = 14604, 14605, 14606, 14607, 14608, 14609, 14610, 14611, 14612, 14613, 14614, 14615, 14619, 14620, 14621

Impact of Having Timely Data

- Able to discern trends over time and to announce results to the media
- Able to break out incidence rates for EBLs by age categories and zip codes
- Able to determine when testing fell off among city and suburban children
- Able to determine that testing rates for 2 year olds were much lower than testing rates for 1 year olds



Collaborative Efforts by the Monroe County Department of Public Health to Address Lead Poisoning

- Data collection and dissemination to help target interventions
- Primary prevention grants
- Environmental inspections at lower thresholds than are required by NYSDOH
- Close collaboration with CPLP, City of Rochester, insurers, health systems, WNY Lead Poisoning Resource Center and others in efforts to increase blood lead testing rates among children

Efforts by the City of Rochester to Address Lead Poisoning

- Dedicated phone line to handle lead poisoning issues
- Availability of free visual home inspections
- Development of the municipal lead law
- Financial assistance for homeowners to address lead hazards



Rochester's Lead Law Targeting At-Risk Housing

- Visual inspection of all rental properties prior to Certificate of Occupancy being issued (now on a 3 year cycle for all rental properties)
- Presumption that deteriorated paint = lead paint
- Dust wipes in "high risk areas" if they PASS visual inspection
- All violations must be addressed
- Requires mitigation NOT removal of lead
- Workers must have lead safe work practices training (owners may do work themselves)
- Clearance testing by a private firm prior to C of O issuance

Results of 8 Year Review of Rochester's Lead-Based Paint Poisoning Ordinance

	# of Inspections	# (%) Failing Inspection
Exterior Visual Inspections (Structures)	73,534	9,987 (14%)
Interior Visual Inspections (Units)	115,634	5,804 (5%)
Interior Dust Wipe Testing (Units)	29,330	3,182 (11%)

Vacate orders for units with severe interior deteriorated paint or dust lead hazard – 515 issued in 8 years

Citations for non-compliance of lead ordinance violations – 1,880

We Are Winning the Battle But the War Isn't Over



- Need to sustain progress
- Avoid declaring victory too soon
- Continue emphasizing both primary and secondary prevention
- Continue working together and expand collaboration further toward the common goal of eradicating lead