

The North Carolina Childhood Lead Poisoning Prevention Program

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Environmental Health Section

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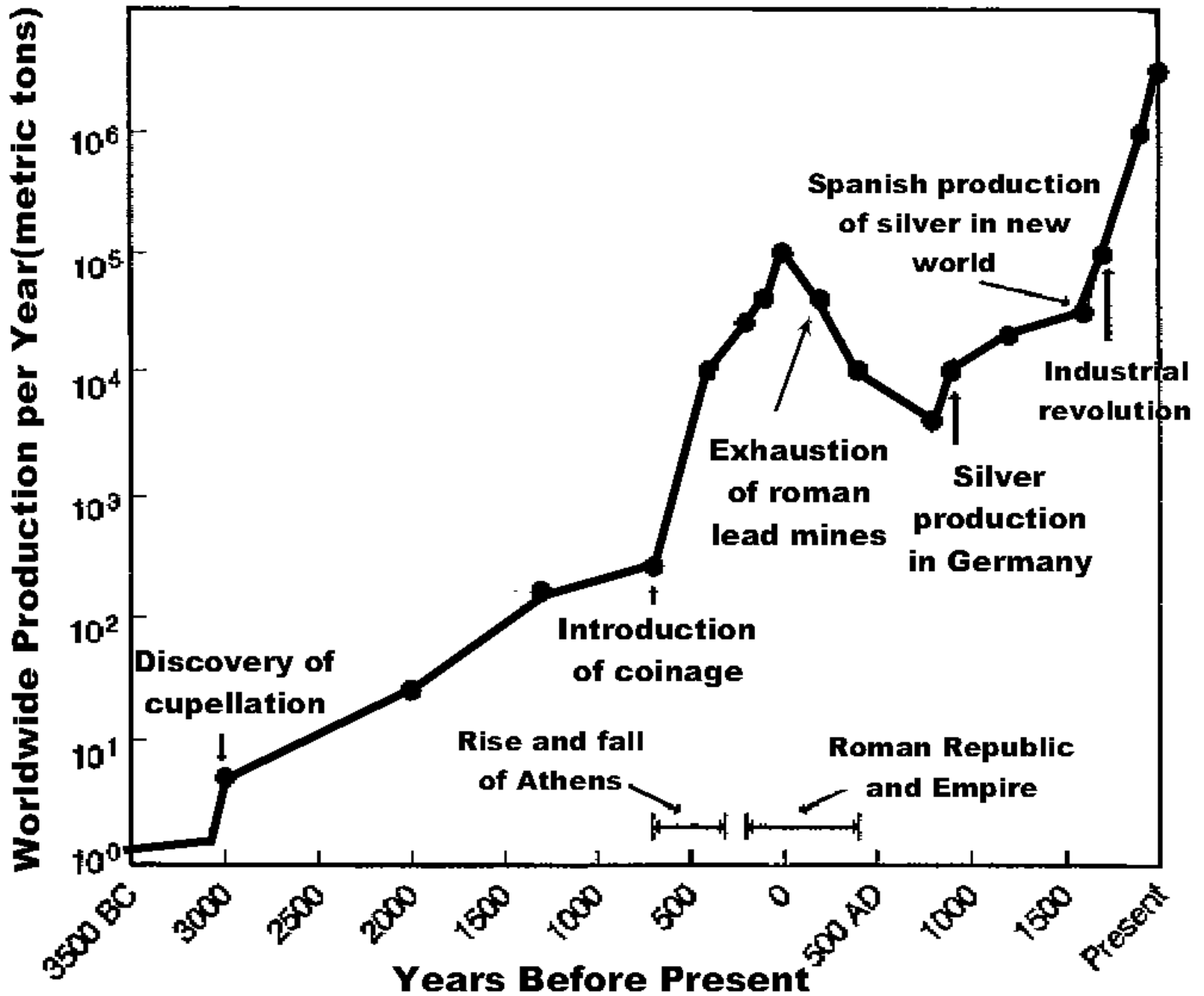
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NC CLPP Organization

Staff of 15 in the Children's Environmental Health Branch

- 6 Regional Consultants**
- Field Supervisor**
- Program Manager**
- Nursing Consultant**
- Training Coordinator (HUD)**
- Health Educator (CDC)**
- Epidemiologist**
- Data Analyst**
- Data Manager**
- Attorney (AG's Office)**



Historical record of industrial lead production in last 5,000 years

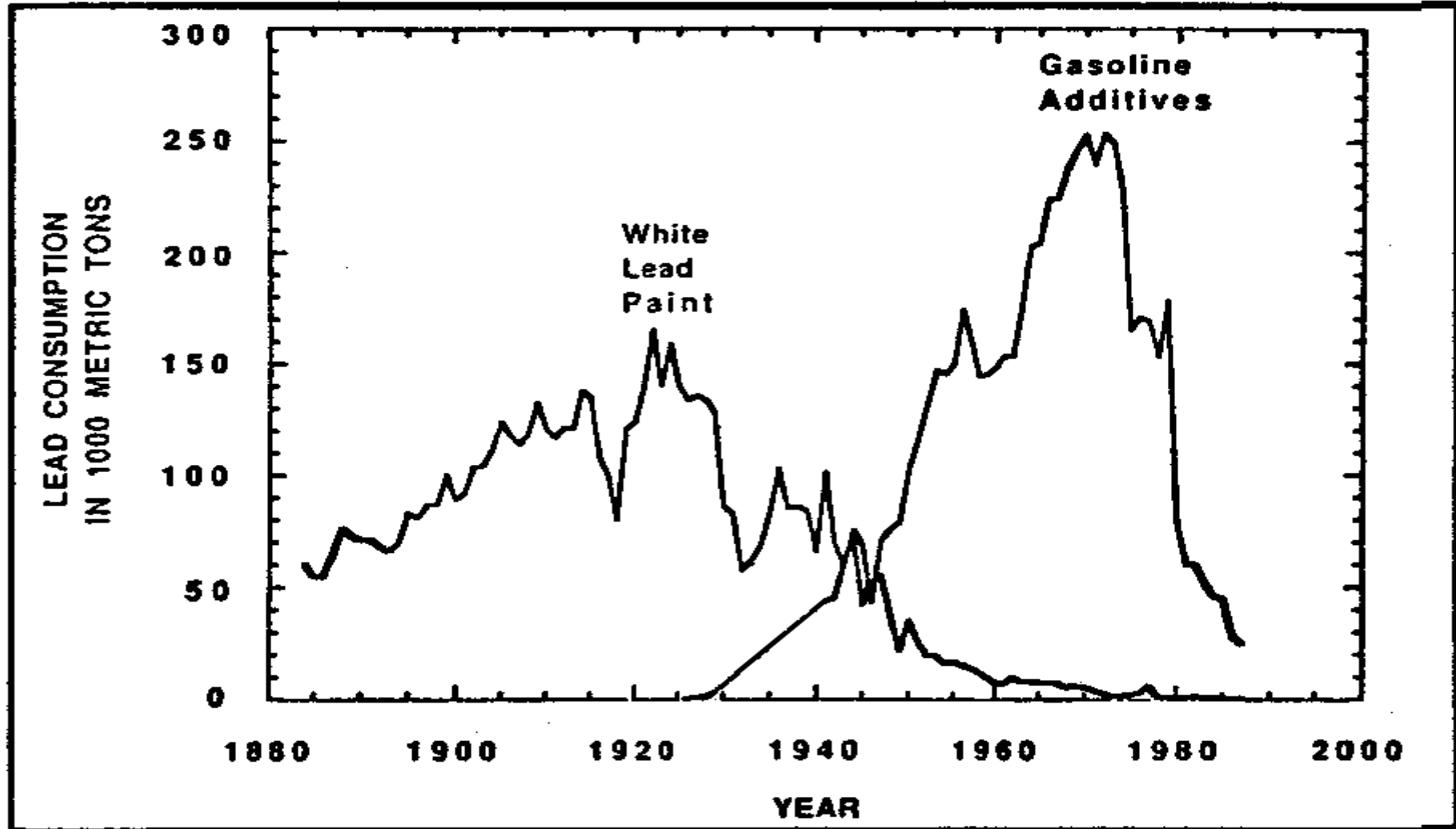


Figure 2. United States lead consumption, 1880-1987. Reprinted with permission from Clark S et al. Urban lead exposures of children in Cincinnati, Ohio. *Chemical Speciation and Bioavailability*. 1991;3:163-171. Copyright © 1991.

Sources of Lead

Lead-Based Paint, Dust & Soil

Air Pollution

Drinking Water

Traditional Medicines

Lead-Glazed Ceramics

Parental Occupations & Hobbies

Food (Mexican Candy)

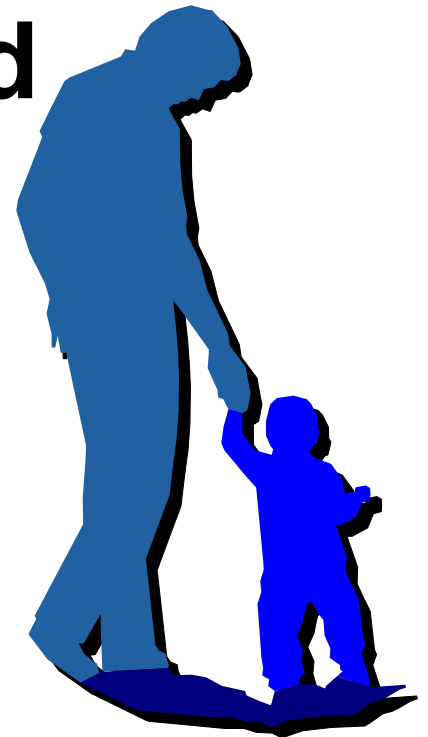
Vinyl Miniblinds

Lead-Contaminated Toys



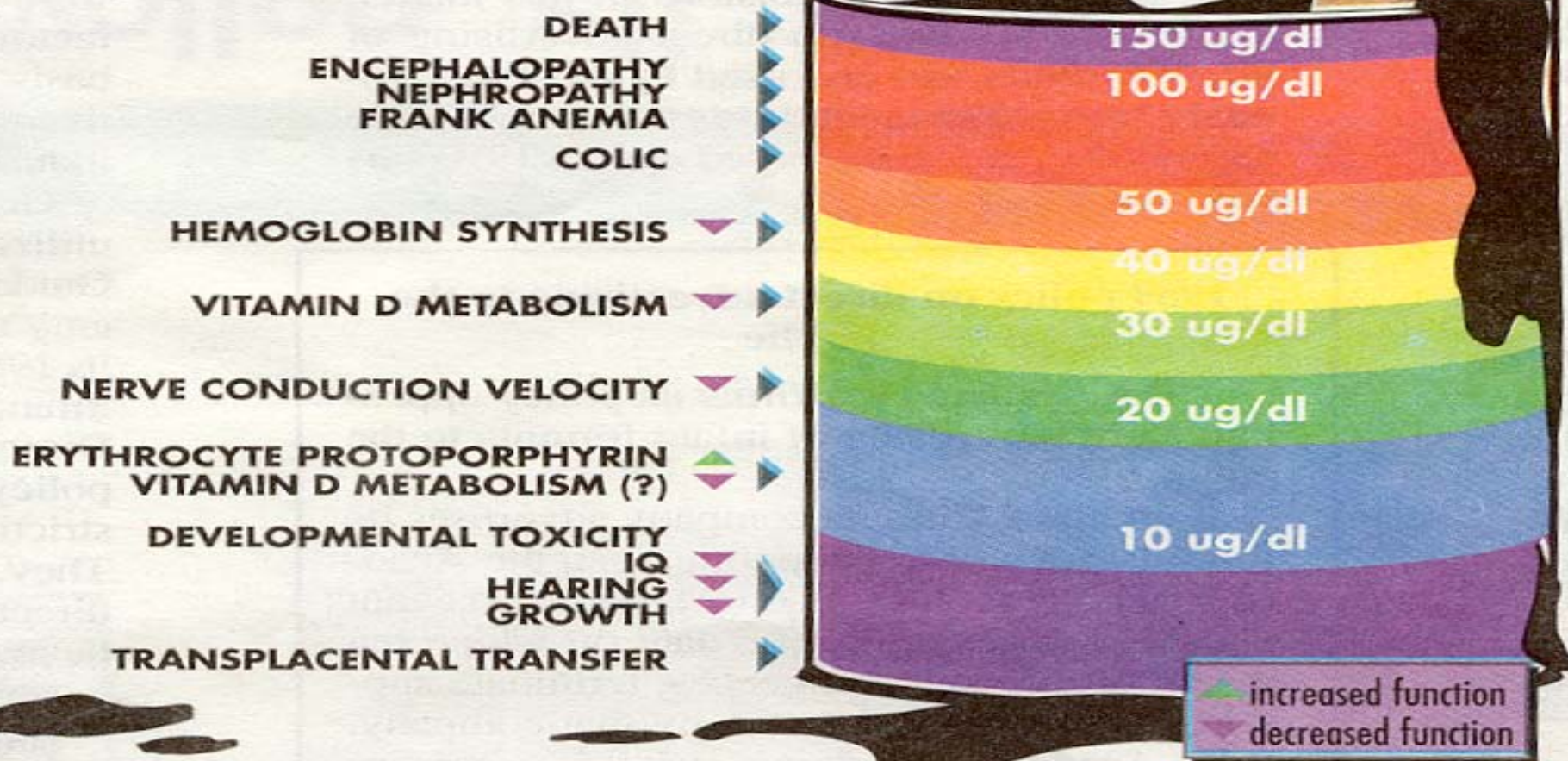
Children are at Greater Risk

- **hand to mouth activity**
- **greater sensitivity to lead**
- **absorb more lead**



INORGANIC LEAD:

The Lowest Observed Effects in Children



The chart shows the effects of lead contamination at various levels. The levels in this diagram do not necessarily indicate the lowest levels at which lead exerts an effect. These are the levels at which studies have adequately demonstrated an effect.

Childhood Lead Poisoning

Costs To The State:

Direct Medical & Public Health Costs

Special Education

Juvenile Justice

Lost Future Earnings

CDC Terminology

**Elevated blood lead level (EBL):
10 *ug*/dL or greater**

North Carolina State Law

**Confirmed lead poisoning:
20 *ug*/dL or greater**

CDC Screening Guidelines

Universal assessment/targeted screening at 12 and 24 months or at first entry before age 6

In North Carolina, mandatory blood lead testing for Medicaid, WIC, & HealthChoice

Analysis at no charge through the State Laboratory

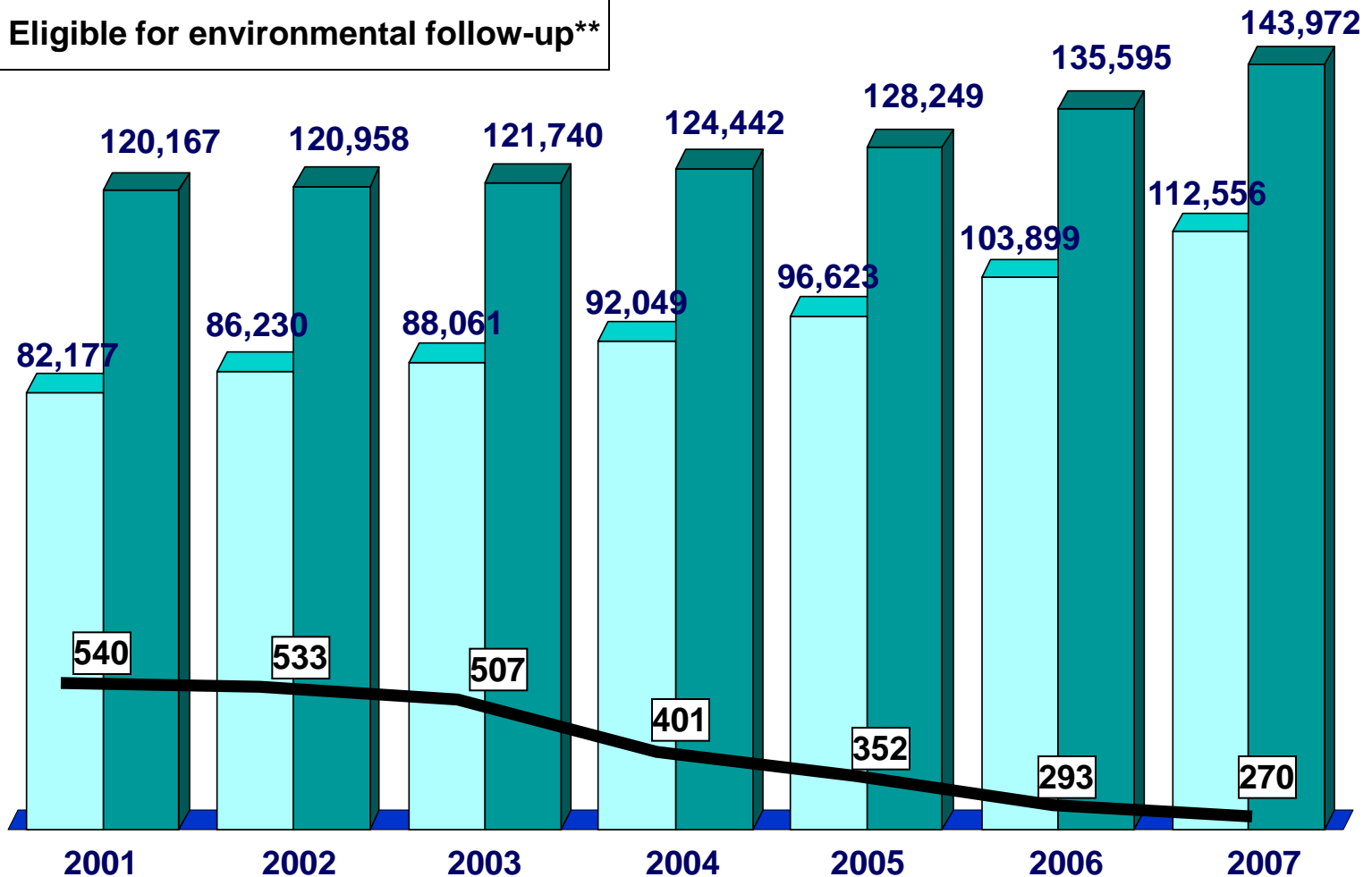


North Carolina Children Tested for Lead Poisoning, Years 1995-2007

Year	ages 6 mos to 6 yrs		ages 1 and 2 yrs		Confirmed ages 6 mos to 6 yrs	
	Number		Number	% tested	10-19 $\mu\text{g/dL}$	≥ 20 $\mu\text{g/dL}$
1995	87,894		44,308	21.9	718	178
1996	95,028		47,479	23.4	661	137
1997	95,166		49,423	24.0	547	114
1998	95,168		53,163	25.2	544	80
1999	105,552		66,401	30.4	565	80
2000	115,498		75,752	33.6	676	122
2001	120,167		82,177	35.1	467	73
2002	120,958		86,230	36.2	465	68
2003	121,740		88,061	37.4	469	38
2004	124,442		92,049	39.1	349	52
2005	128,249		96,623	40.6	299	53
2006	135,595		103,899	42.8	255	38
2007	143,972		112,556	44.9	232	38

North Carolina Childhood Blood Lead Surveillance Data

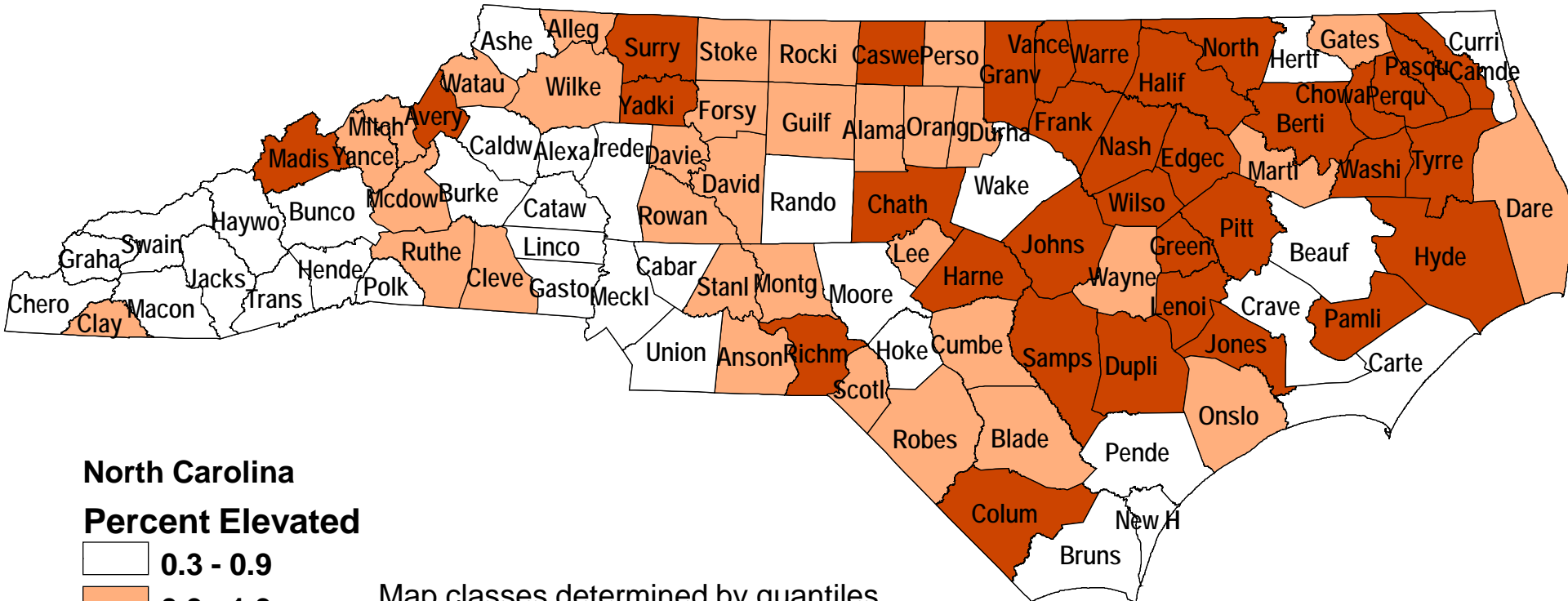
Number of Children Tested for Lead Poisoning*



Characteristics and Estimated Prevalences of North Carolina Children Tested for Lead Poisoning During 2003-2007, Ages 6 months to 6 years

Variable	Testing Population N (Percent of Total)	Blood lead level ($\mu\text{g}/\text{dL}$) N (Percent)	
		≥ 10	≥ 20
Age	6-12 months	37,167 (5.7)	285 (0.8) 47 (0.1)
	1 year	312,544 (47.8)	3,074 (1.0) 404 (0.1)
	2 years	180,550 (27.6)	2,246 (1.2) 259 (0.1)
	3 years	42,370 (6.5)	515 (1.2) 65 (0.2)
	4 years	46,209 (7.1)	416 (0.9) 62 (0.1)
	5 years	34,910 (5.3)	295 (0.8) 40 (0.1)
Race/ Ethnicity	Black	170,311 (26.1)	2,479 (1.5) 262 (0.2)
	White	288,205 (44.1)	2,358 (0.8) 320 (0.1)
	Hispanic	113,484 (17.4)	1,254 (1.1) 184 (0.2)
	Native American	8,884 (1.4)	110 (1.2) 18 (0.2)
	Other	19,620 (3.0)	297 (1.5) 52 (0.3)
	Unknown	53,246 (8.1)	333 (0.6) 41 (0.1)
Sex	Male	321,651 (49.2)	3,634 (1.1) 487 (0.2)
	Female	325,610 (49.8)	3,167 (1.0) 386 (0.1)
	Unknown	6,489 (1.0)	30 (0.5) 4 (0.1)
Residence	Rural County	431,487 (66.0)	4,867 (1.1) 621 (0.1)
	Urban County	222,263 (34.0)	1,964 (0.9) 256 (0.1)
Income	Medicaid	436,880 (66.8)	5,303 (1.2) 661 (0.2)
	Non-Medicaid	216,870 (33.2)	1,528 (0.7) 216 (0.1)
Overall	653,750 children tested		6,831 (1.0) 877 (0.1)

Percent of 1- and 2-Year Old Children with Blood Lead Level $\geq 10 \mu\text{g/dL}$ 2003-2007



North Carolina
Percent Elevated

- 0.3 - 0.9
- 0.9 - 1.3
- 1.3 - 4.1

Map classes determined by quantiles.

Multi-tier Approach to Follow-up

**diagnostic testing / periodic retesting /
environmental investigation (voluntary)
/ health education & nutritional counseling** $\geq 10 \text{ ug/dL}$

**medical evaluation / environmental
investigation & remediation (mandatory)** $\geq 20 \text{ ug/dL}$

chelation therapy $\geq 45 \text{ ug/dL}$

**Blood Lead Reduction among Children
with Confirmed Elevation $\geq 10 \mu\text{g/dL}^*$ (overall)
Years 1995 - 2006**

Year	Number Cases	Mean Level* (% Reduced) at:		
		Confirmation	6 mos follow/up	1 yr follow/up
1995	881	16.3	14.3 (12%)	12.2 (25%)
1996	789	15.5	13.4 (14%)	11.6 (25%)
1997	649	15.8	13.3 (16%)	11.7 (26%)
1998	618	15.2	11.7 (23%)	10.5 (30%)
1999	638	14.6	12.1 (17%)	10.3 (29%)
2000	790	15.3	11.7 (24%)	9.8 (36%)
2001	533	14.7	11.3 (23%)	9.8 (33%)
2002	527	15.0	11.0 (26%)	9.7 (35%)
2003	506	14.3	10.5 (26%)	8.3 (42%)
2004	398	15.0	10.7 (29%)	8.7 (42%)
2005	347	15.4	11.2 (28%)	9.3 (40%)
2006	293	15.5	11.3 (27%)	9.0 (42%)

* micrograms per deciliter

North Carolina Law



- **laboratory reporting of all blood lead test results**
- **investigation of confirmed lead poisoning and EBL cases**
- **remediation of identified hazards for confirmed lead poisoning cases**

Innovative Provision In State Law

Voluntary Lead-Safe Housing/Preventive Maintenance Program Targeting Older Rental Property



Liability Relief Offered To Participants

Other State & Federal Lead Laws

- **Certification & Accreditation (EPA/DHHS)**
- **Disclosure (EPA/HUD)**
- **Federal Housing (HUD)**
- **Renovation & Remodeling (EPA)**

Looking Ahead

- **Addressing Blood Lead Levels <10 *ug/dL***
- **Testing Pregnant Women**
- **Transition To Healthy Homes**















