

# The North Carolina Childhood Lead Poisoning Prevention Program

**Ed Norman, MPH**

**North Carolina DHHS**

**Division of Public Health**

**Environmental Health Section**

**Environmental Program Manager**

**[ed.norman@dhhs.nc.gov](mailto:ed.norman@dhhs.nc.gov)**

**(919) 707-5951**



# NC Childhood Lead Poisoning Prevention Program

State Childhood Lead Surveillance Team and Regional EHSs  
Division of Public Health/Environmental Health Section

Data management

Coordinate training & response

Environmental investigation & sampling

Local Health Department EHSs/Lead Nurses

Blood Lead Testing

Environmental investigation & sampling

Clinical case management

Education

Primary Care Providers

Risk screening

Blood Lead Testing

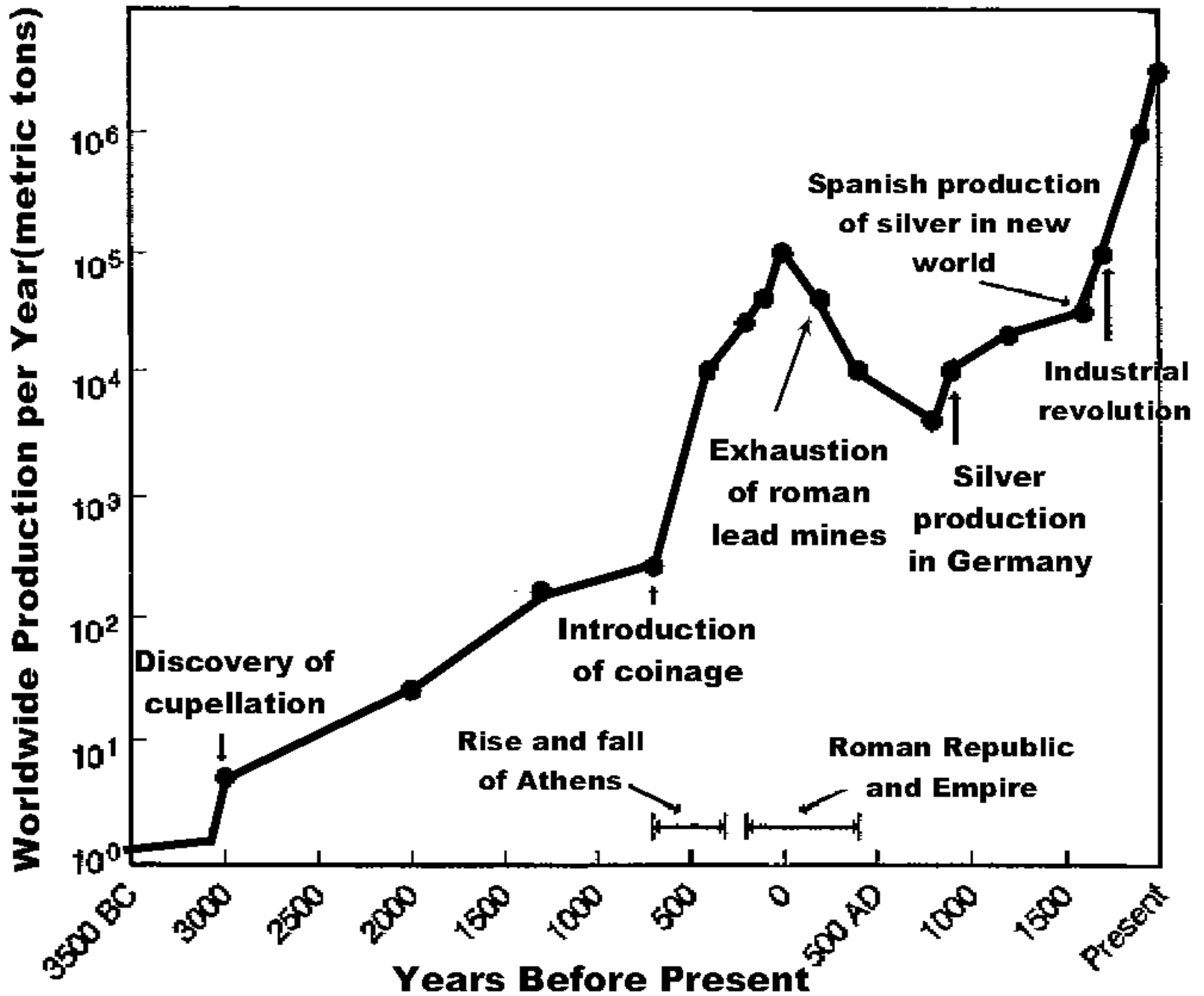
Clinical evaluation & interventions

# Children's Environmental Health (Regional Staff):

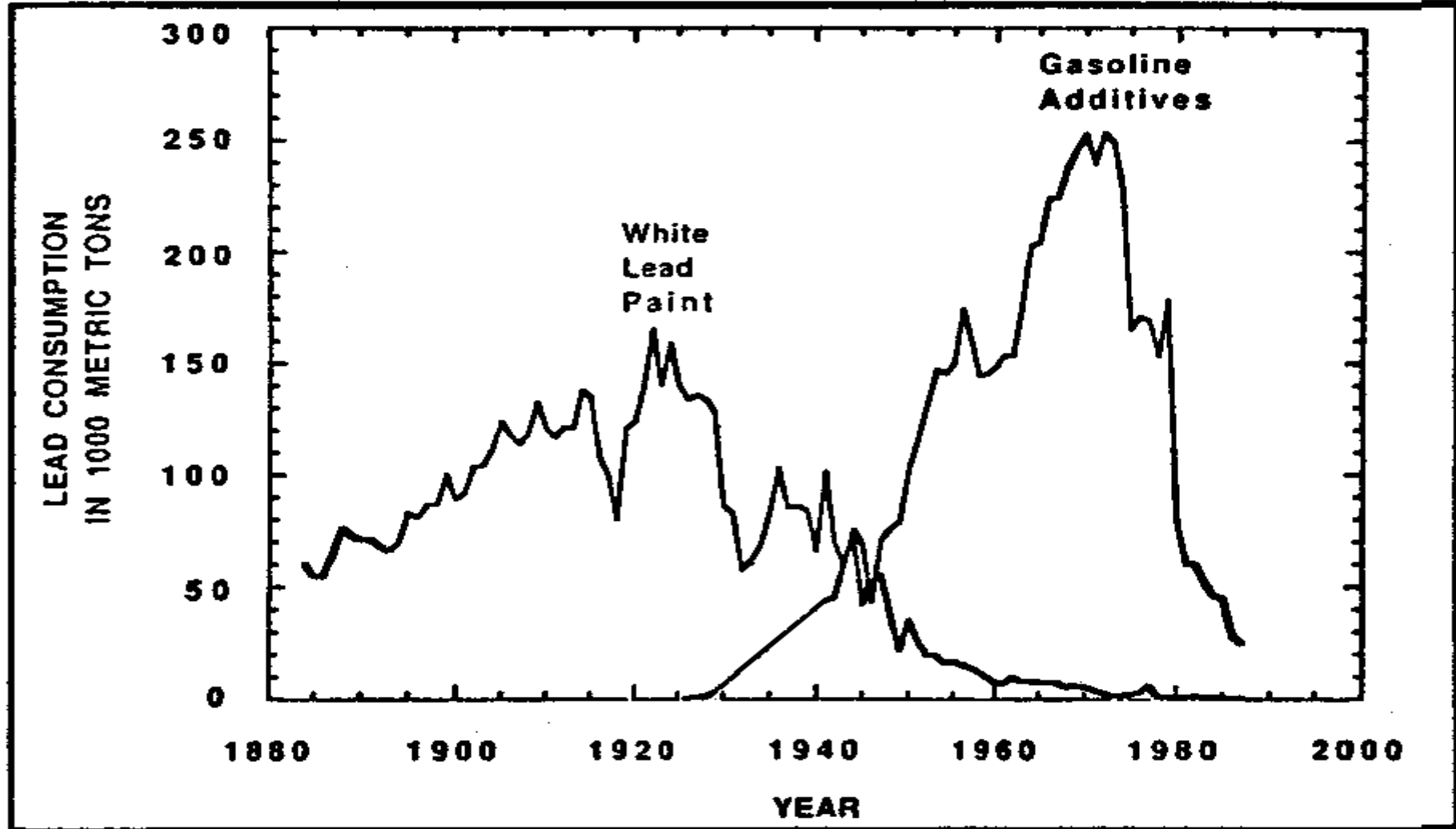
- **Kimly Blount (Rocky Mount), Field Supervisor**
  - David Brown (Durham)
  - Alan Huneycutt (Cornelius)
  - Brenda Bass (Mt. Olive)
  - Donna Gilbird (Elizabeth City)
  - Robert Hunt (Elm City)
  - Robert Pearsall (Hampstead)
  - Tonya Zimmerman (Salisbury)
  - Carissa Moore (Black Mountain)
  - Barrette Gregory (Millers Creek)

# Children's Environmental Health (Data Management Staff):

- **Tena Hand (Data Manager/Team Leader)**
  - **Melanie Napier (Grant Specialist)**
  - **Samantha Sites**
  - **Jeff Smedley**



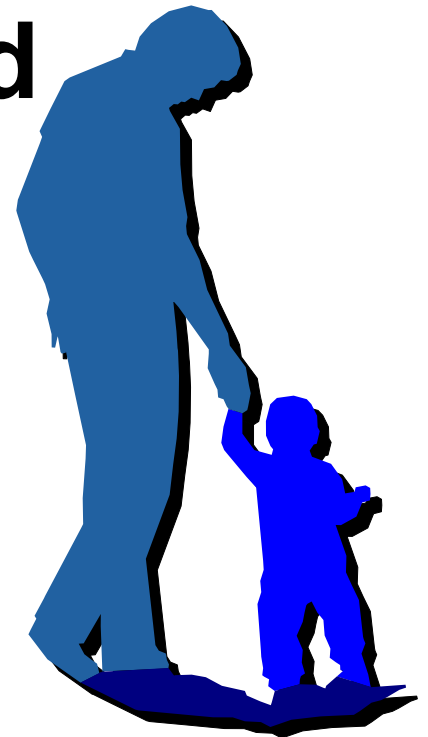
**Historical record of industrial lead production in last 5,000 years**



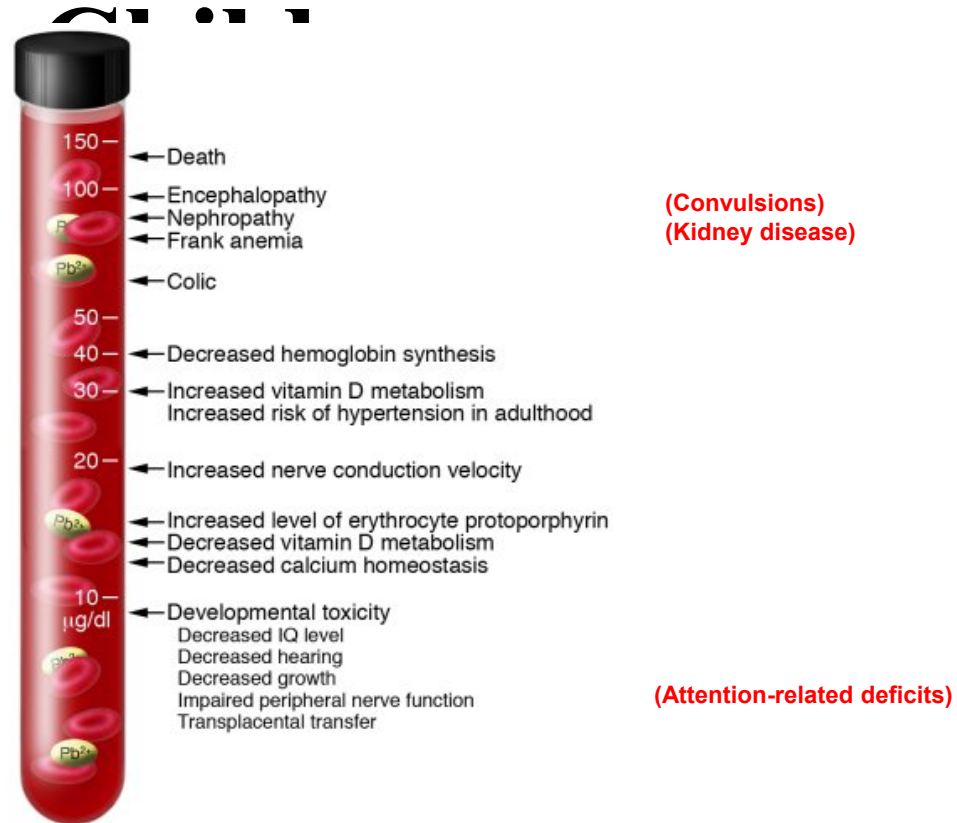
**Figure 2.** United States lead consumption, 1880-1987. Reprinted with permission from Clark S et al. Urban lead exposures of children in Cincinnati, Ohio. *Chemical Speciation and Bioavailability*. 1991;3:163-171. Copyright © 1991.

# Children are at Greater Risk

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



# Health Effects of Lead in



Bellinger DC, Bellinger AM. Childhood Lead Poisoning: The Torturous Path from Science to Policy. J Clin Invest. 2006 Apr;116(4):853-7. <http://www.jci.org/articles/view/28232>



# **Childhood Lead Poisoning Costs To The State:**

**Direct Medical & Public Health Costs**

**Special Education**

**Juvenile Justice**

**Lost Future Earnings**

# 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**

# 2017 Amendments to North Carolina Law

- Confirmed lead poisoning defined as:  
10  $\mu\text{g}/\text{dL}$  or greater
- Elevated blood lead level defined as:  
5  $\mu\text{g}/\text{dL}$  or greater
- 12 months allowed for confirmation
- Pregnant women included
- 6 new regional positions  
to be funded by Medicaid

# **CDC Terminology**

**Reference Value:  
5  $\mu\text{g}/\text{dL}$  or greater**

## **North Carolina State Law**

**Elevated blood lead level (EBL):  
5  $\mu\text{g}/\text{dL}$  or greater**

**Confirmed lead poisoning:  
10  $\mu\text{g}/\text{dL}$  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**



# Blood Lead Testing of Medicaid-Enrolled Children

Report for Individual Medicaid Providers for the period January 1, 2007 through December 31, 2007

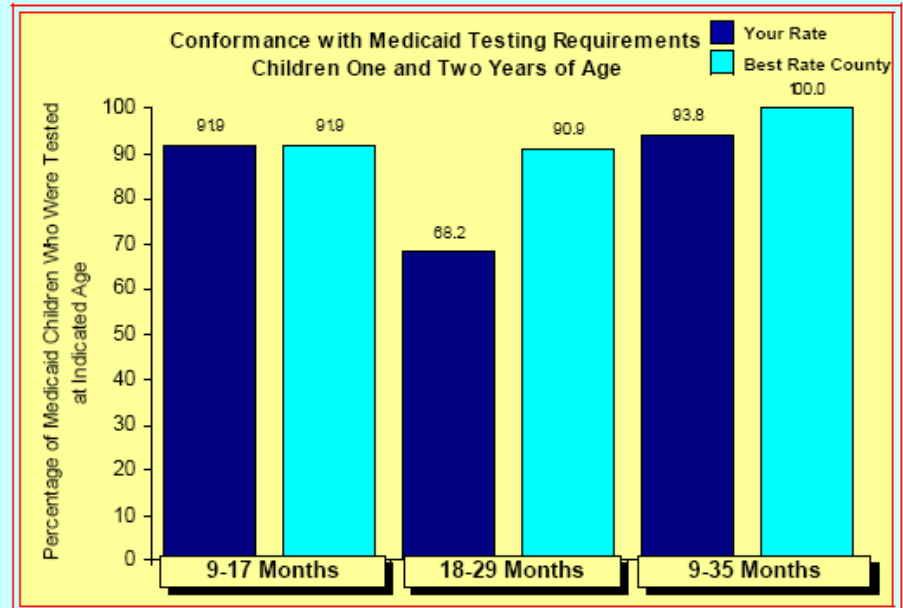
**Provider** WENDOVER PEDIATRICS PA  
1307 WEST WENDOVER AVENUE  
GREENSBORO NC 27408-8117

**Your Overall Testing Rate:** <sup>(1)</sup> **93.8 %**  
**Your Testing Rate Information**

Testing Numbers and Rates Among Medicaid Children	Age <sup>(2)</sup> 1	Age <sup>(2)</sup> 2
Number of Children Seen	458	365
Number of Children Tested	421	249
<b>Testing Rate (%) <sup>(3)</sup></b>	<b>91.9</b>	<b>68.2</b>
Number of Children Seen <sup>(4)</sup> But Not Tested	37	116

**Explanation:**

- Overall testing rate includes children ages 9-35 months.
- Age 1 includes children between 9-17 months of age. Age 2 includes children between 18-29 months of age.
- Percentage of Medicaid children who were seen by your practice and received blood lead test(s) during the indicated age by your practice or elsewhere.
- Number of children who were seen by your practice but were not tested during the indicated age.



## Did You Know That...

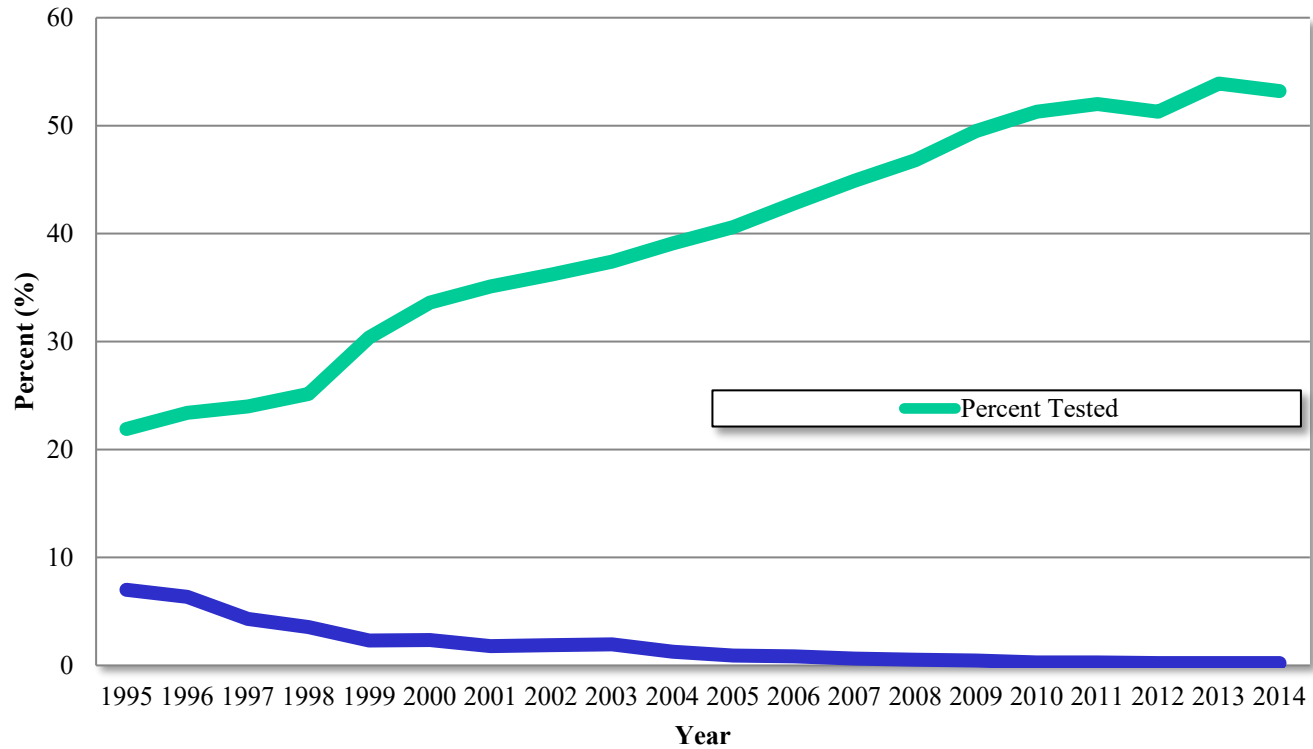
Federal rules require that ALL CHILDREN who are enrolled in Medicaid receive a blood lead test at:

- 12 months of age and
- 24 months of age
- children between ages 36-72 months must be tested if they have not previously been tested

2,071 North Carolina children were identified with lead poisoning ( $\geq 10 \mu\text{g/dL}$ ) during the previous five years (2002-2006)

- 82% of these children were enrolled in Medicaid

## Percent of NC Children Tested for Lead Poisoning, 1 and 2 Year-olds



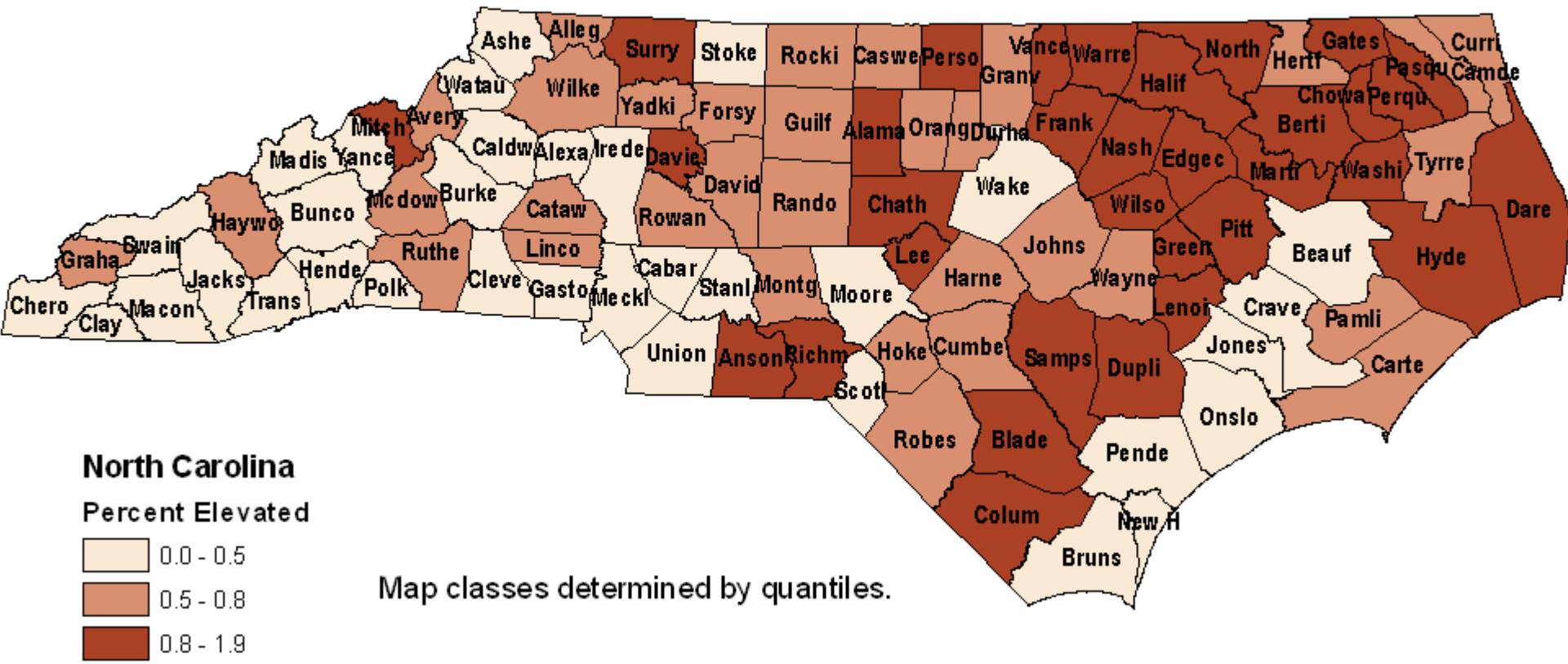
Data source: NCLEAD Surveillance System

**Characteristics and Estimated Prevalences of North Carolina Children  
Tested<sup>1</sup> for Lead Poisoning During 2005-2009, Ages 6 months to 6 years**

Variable	Testing Population N (Percent of Total)	Blood lead level <sup>2</sup> (µg/dL) N (Percent)		
		≥10	≥20	
Age	6-12 months	37,933 (5.3)	180 (0.5)	35 (0.1)
	1 year	348,436 (48.4)	2,114 (0.6)	313 (0.1)
	2 years	214,779 (29.8)	1,551 (0.7)	213 (0.1)
	3 years	42,293 (5.9)	356 (0.8)	55 (0.1)
	4 years	44,674 (6.2)	247 (0.6)	40 (0.1)
	5 years	32,142 (4.5)	180 (0.6)	26 (0.1)
Race/Ethnicity <sup>3</sup>	Black	177,918 (24.7)	1,499 (0.8)	197 (0.1)
	White	308,649 (42.9)	1,634 (0.5)	240 (0.1)
	Hispanic	127,975 (17.8)	842 (0.7)	149 (0.1)
	Native American	8,784 (1.2)	70 (0.8)	12 (0.1)
	Other	21,716 (3.0)	261 (1.2)	43 (0.2)
	Unknown	75,215 (10.4)	322 (0.4)	41 (0.1)
Sex	Male	354,316 (49.2)	2,487 (0.7)	405 (0.1)
	Female	358,221 (49.7)	2,119 (0.6)	272 (0.1)
	Unknown	7,720 (1.1)	22 (0.3)	5 (0.1)
Residence	Rural County	466,322 (64.7)	3,314 (0.7)	486 (0.1)
	Urban County	253,935 (35.3)	1,314 (0.5)	196 (0.1)
Income <sup>4</sup>	Medicaid	380,258 (67.9)	3,052 (0.8)	446 (0.1)
	Non-Medicaid	179,436 (32.1)	839 (0.5)	121 (0.1)
<b>Overall</b>	<b>720,257 children tested</b>		<b>4,628<sup>▼</sup> (0.6)</b>	<b>682 (0.1)</b>

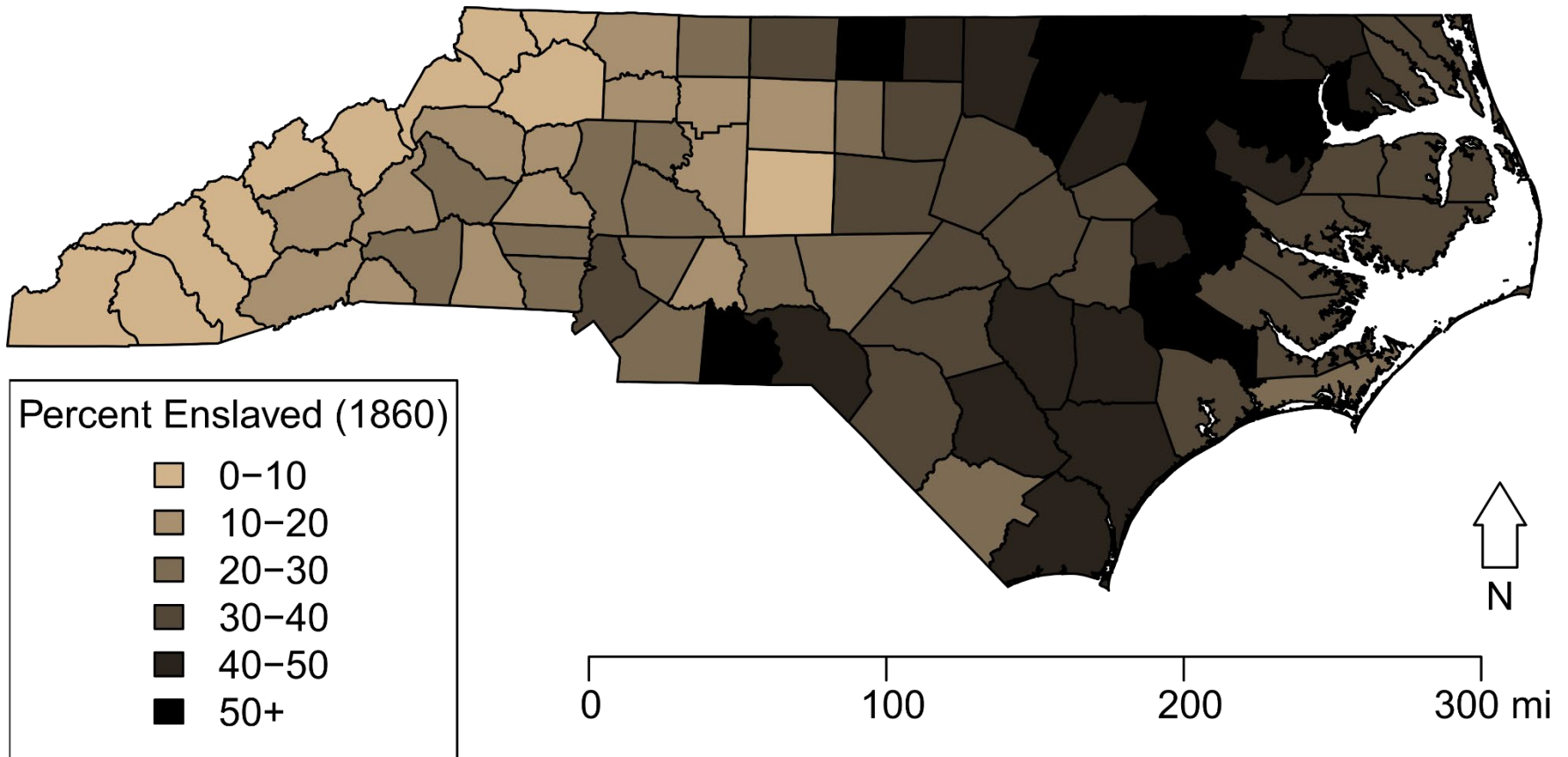


# Percent of 1- and 2-Year Old Children with Blood Lead Level $\geq 10$ ug/dL 2005-2009



# Slavery in North Carolina (1860)

300,000 Slaves, or  $\frac{1}{3}$  of NC's population



Source: 1860 Census: Population, Agriculture & Other Data [US, States & Counties]

Map constructed by Nat MacNeill, UNC-Chapel Hill, Epidemiology Department

# Statewide Confirmed Cases 2014-2019

## Elevated Blood Lead Levels & Confirmed Lead Poisoning

Year	5-9 $\mu\text{g}/\text{dL}$	>10 $\mu\text{g}/\text{dL}$
2014	482	136
2015	424	150
2016	506	174
2017	436	137
2018	401	147
2019	370	146

# Rule Amendment Effective October 1, 2019

## • Child Care Sanitation Rule .2816

- 1) All licensed child care centers to test all drinking water and food preparation sinks within a year and again every 3 years
- 2) Initial samples collected by the child care operator using the EPA 3Ts method
- 3) Laboratories required to report test results to DHHS
- 4) DHHS (DPH regional or LHD staff) required to sample if elevated levels reported
- 5) Interim measures and mitigation mandated
- 6) Parent/staff notification & public availability of testing data required whenever elevated water lead levels confirmed
- 7) Monitoring conducted at routine sanitation inspections

# EPA WIIN grant (~\$1.5 million)

- Awarded in October 2019, the same month that amended Rule .2816 became effective
- Contract awarded to RTI International in February 2020
- Components of the contract include:
  - Electronic registration
  - Online video & webinar training
  - Help desk
  - Test kit mailout
  - Laboratory analysis (~30,000 samples) and reporting
  - Public mapper
- Testing began in July 2020

# Test results as of 8/12/21

- Of an estimated 4,400 licensed child care centers:
- >4,000 (91.6%) have been enrolled and mailed test kits
- 87.8% of centers have completed testing
- 8.6% (333) of centers have at least one sample >15 ppb
- 2.3% (484) of initial samples >15 ppb
- fewer than 25% of initial elevations confirmed and in need of further mitigation

# Other State & Federal Lead Laws

- **Abatement (EPA/DPH)**
- **Renovation, Repair & Painting (EPA/DPH)**
- **Disclosure (EPA/HUD)**
- **Lead Hazard Control (HUD)**
- **Worker Protection (OSHA)**

# 2021 Legislative Session

- H272 decreased water lead action level to 10 ppb effective December 1, 2021  
(3.4%/722 samples & 11.9%/459 centers)
- Senate & House budgets both include a special Provision (\$150 million) to include:
  - Water lead testing and mitigation at all public & charter schools as well as all other child care facilities
  - Asbestos & lead paint testing and mitigation at all public schools, charter schools & child care facilities
  - House budget carves out \$10 million for residential housing lead-related remediation