Lead Exposure Health Data

Technical Assistance to Brownfields Program
EPA Region 1

Sara Wakai, PhD

Assistant Professor, Center for Population Health

August 2024

UCONN HEALTH

Lead Exposure Health Data

Welcome & Introduction

- Sara Wakai, PhD, Assistant Professor
  - UConn Health, Center for Population Health

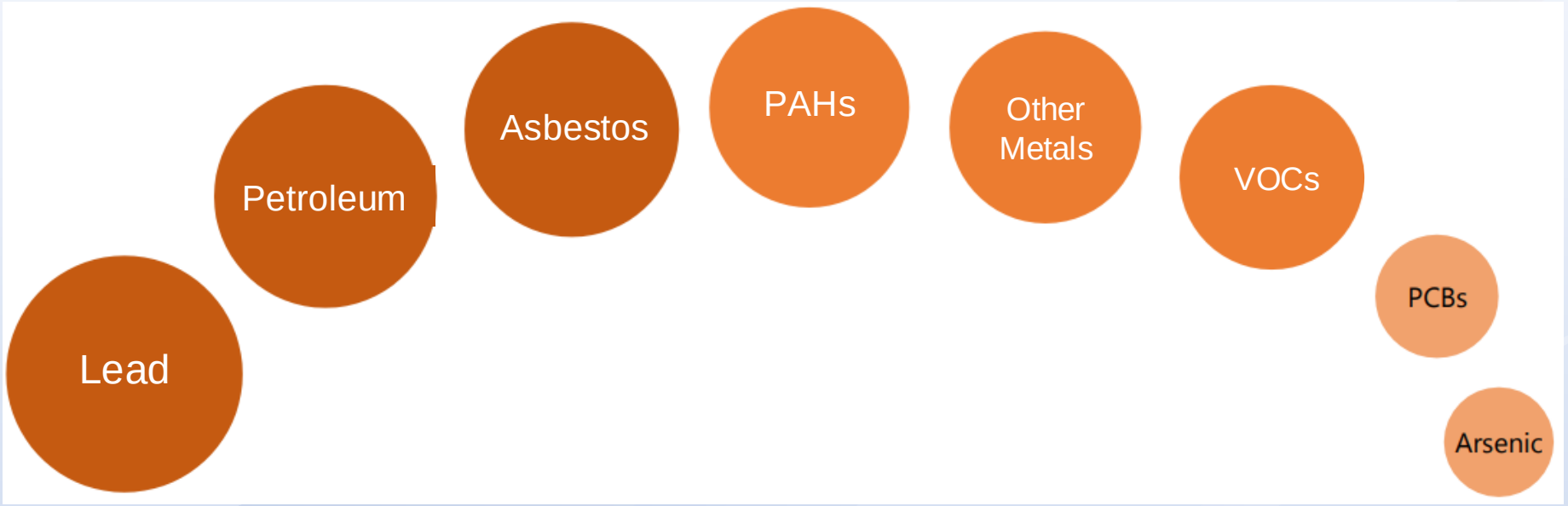
Acknowledgement - Technical Assistance to Brownfields Program

- Randi Mendes, PhD, Program Director
  - Civil and Environmental Engineering, UConn
  - Program Director UConn Technical Assistance to Brownfields Program (TAB). Region 1 (New England States)
- Marisa Chrysochoou, PhD, Dean of Engineering
  - School of Engineering, University of Missouri
  - Program Director UConn Technical Assistance to Brownfields Program (TAB). Region 1 (New England States)

Learning Objectives

- Review sources of environmental lead exposure
- Examine health effects commonly associated with lead exposure
- Explore data sources that monitor lead exposure health risks

Environmental Contaminants Found At Brownfield Sites



Sources of Lead at Brownfields Sites	
Source of Lead	**Example of Previous Site Uses**
Paint (before 1978)	Old structures and buildings, landfill operations, aircraft component manufacturing
High Traffic Areas (before 1996)	Land next to heavily trafficked roadways or highways built before leaded fuel was phased out
Pesticides (pre-1950)	Agricultural land; facilities engaged in produce packaging and shipping
Sewage Sludge	Sewage treatment plants; agricultural land

Source: EPA 901-F-20-004 December 2020

Sources of Lead in the Environment

- Lead-based paint chips, dust
- Historic gasoline exhaust
- Soil
- Foods
- Drinking water
- Toys
- Cosmetics
- Workplace and “take-home” lead exposure

National Institute of Environmental Health Sciences: Lead (nih.gov)

Sources of Lead Exposure | New Hampshire Department of Health and Human Services (nh.gov)

Individual Exposure Pathways

1 Breathing

2 Eating or drinking

3 Direct contact with the skin

https://www.epa.gov/brownfields/understanding-brownfields

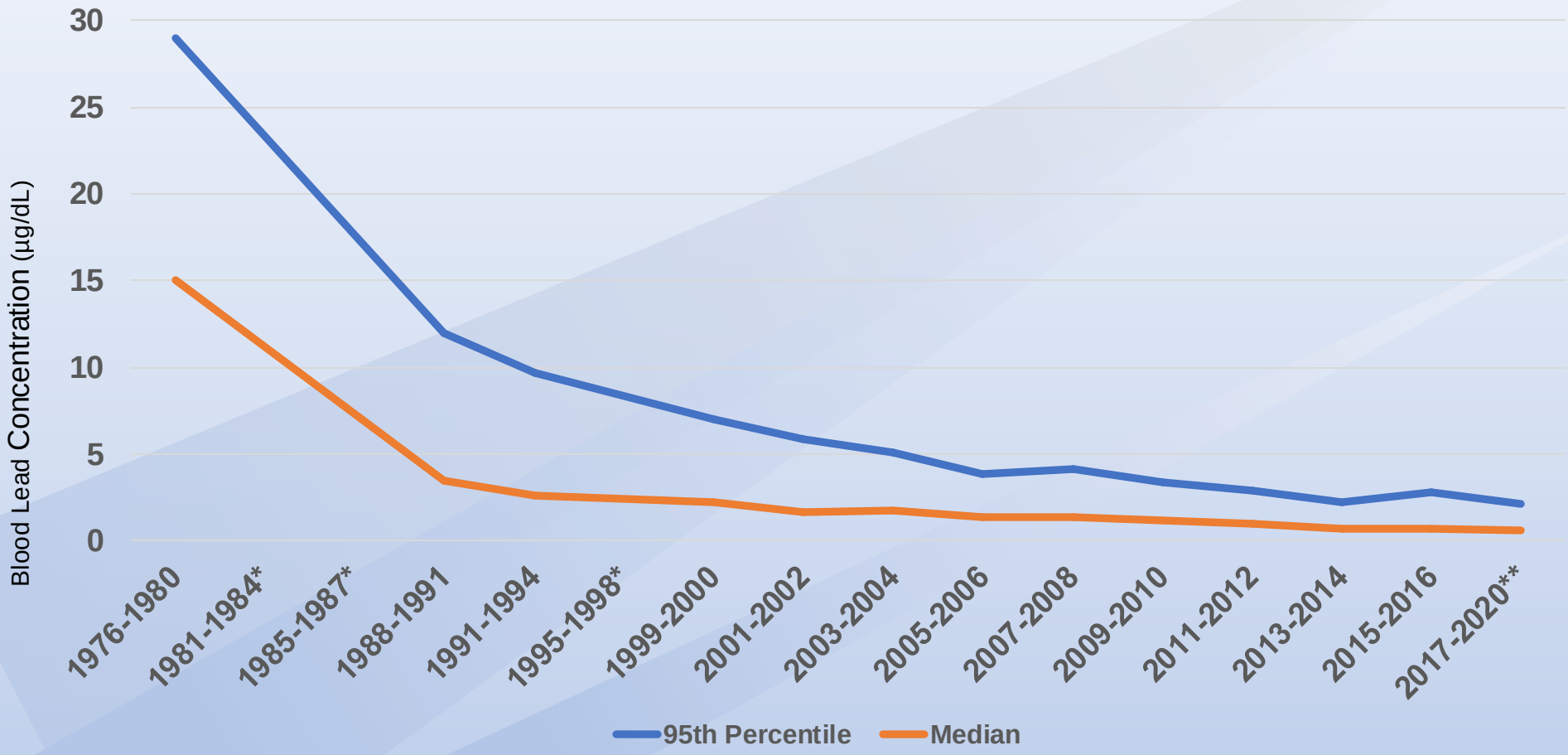
Frequently Used Lead Abbreviations

- Pb - Lead chemical element symbol
- BLL - Blood Lead Level
- BLRV - Blood Lead Reference Level

  3.5 (µg/dL) micrograms of lead per deciliter of blood

CDC Updates Blood Lead Reference Value | Childhood Lead Poisoning Prevention | CDC

Lead in Children Ages 1 to 5 years: Median and 95th percentile concentrations in blood, 1976-2020



DATA: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey.

Data not available between 1981-1987 and 1995-1998

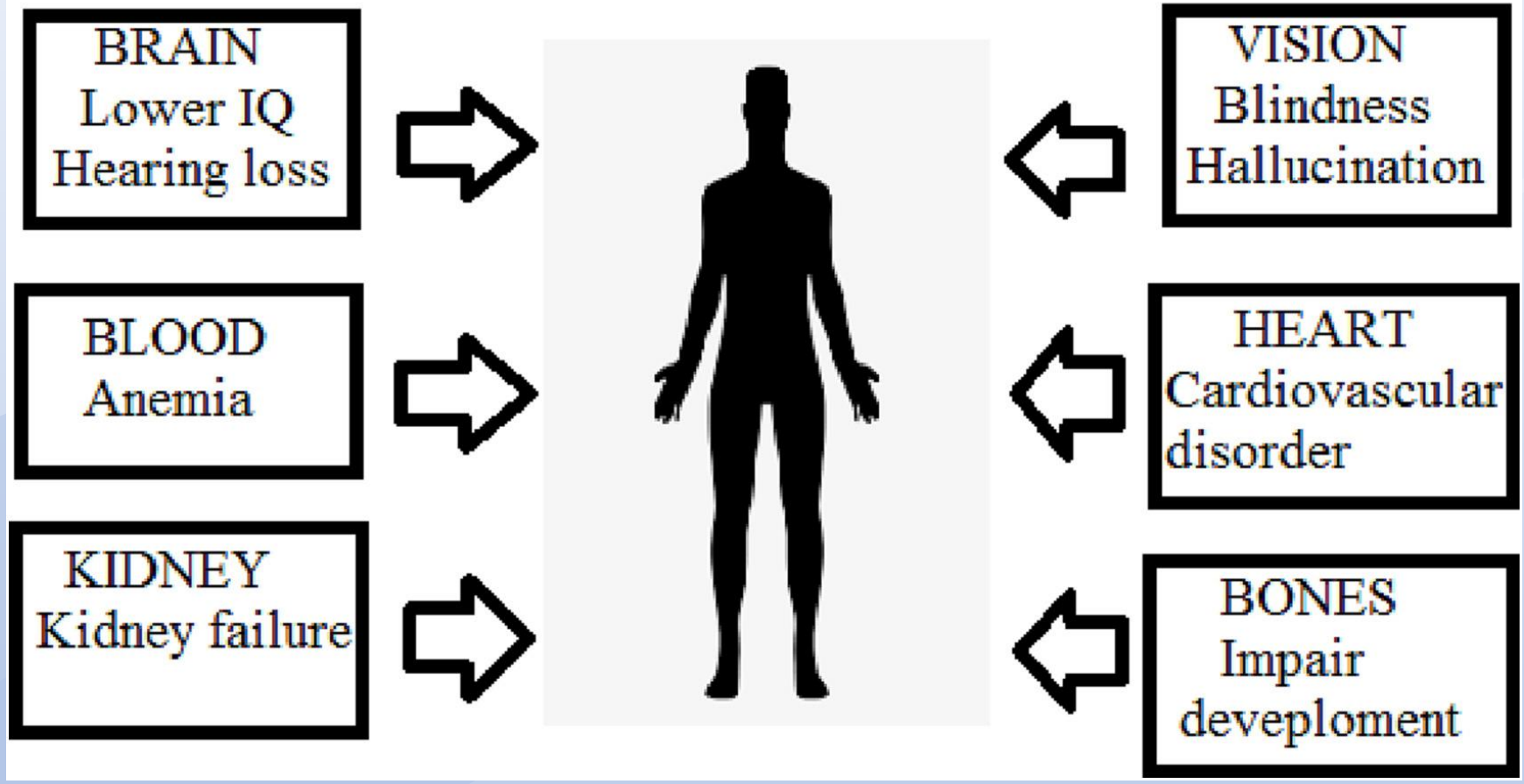
The data for 2020 only go through March 2020 because the NHANES program suspended field operations due to the COVID-19 pandemic. As a result, data collection for the 2019–2020 cycle was not completed..

Source: https://www.epa.gov/americaschildrenenvironment/americas-children-and-environment-data-tables

Health Effects of Lead Exposure

- There is no known safe blood lead level (BLL)
- Even small amount of lead exposure can be harmful
- Multiple exposures are associated with greater BLL
- Lead is toxic to everyone

Consequences of Lead Poisoning on Humans

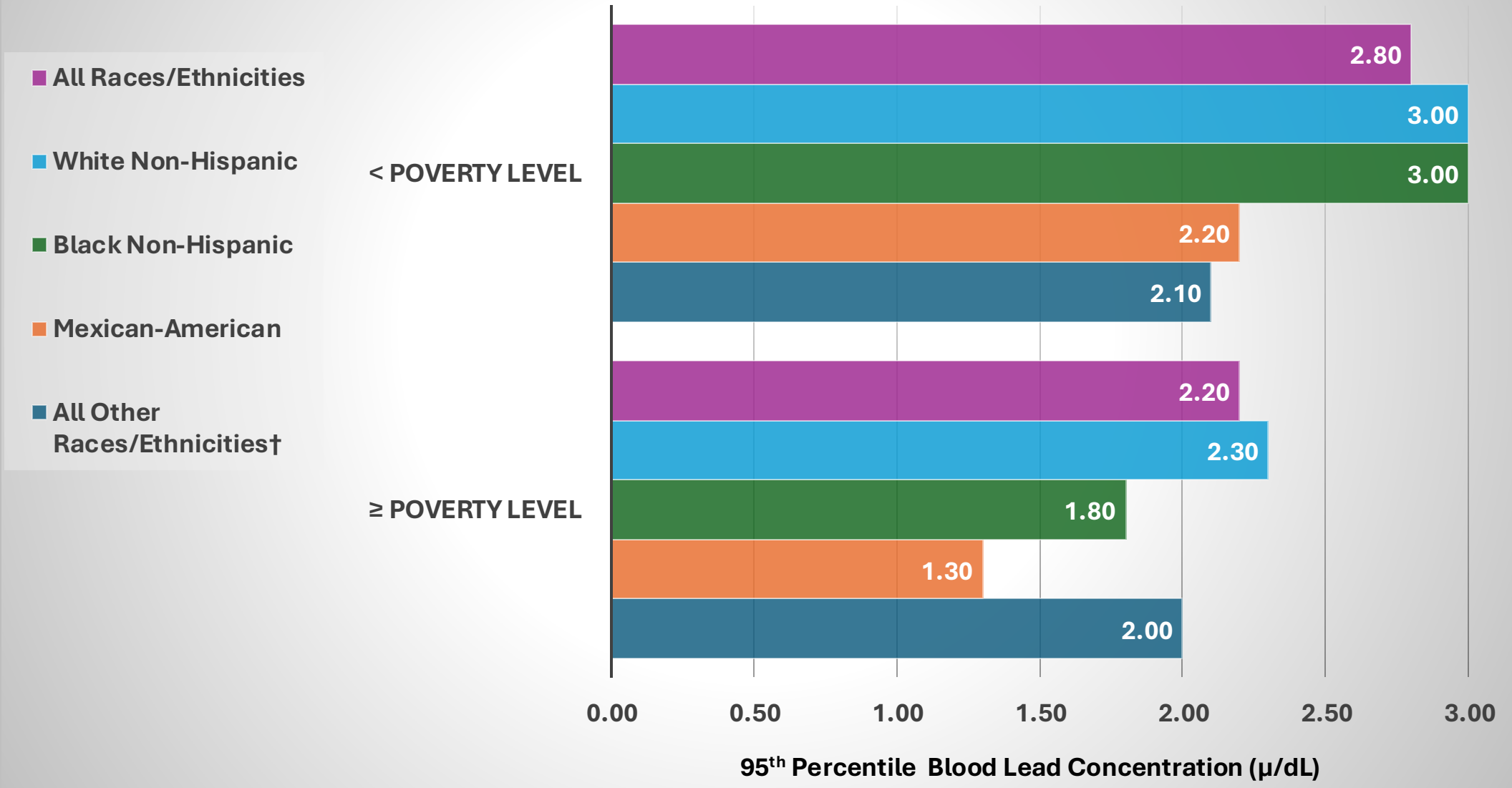


Source: https://www.sciencedirect.com/science/article/pii/S2590182623000048

Lead Exposure Risk Is Not Equally Distributed

- Young children
- Living in housing built before 1978
- Non-Hispanic Black or African American children
- Children eligible for Medicaid
- Children living in areas with higher poverty rates

Lead in children ages 1 to 5 years: 95th percentile concentrations in blood, by race/ethnicity and family income, 2015-2020**



DATA: Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Environmental Health, National Health and Nutrition Examination Survey

† The "All Other Races/Ethnicities" category includes all other races or ethnicities not specified, together with those individuals who report more than one race.

**The data for 2020 only go through March 2020 because the NHANES program suspended field operations due to the COVID-19 pandemic. As a result, data collection for the 2019–2020 cycle was not completed.

Source: https://www.epa.gov/americaschildrenenvironment/americas-children-and-environment-data-tables

State Lead Exposure Data Sources

State	Website	Data Type
CT	Childhood Lead Poisoning Surveillance - Prevalence | Connecticut Data	Screening, incidence, prevalence, number, percent by state, town
ME	Childhood Lead Poisoning | MaineTracking Network (mainepublichealth.gov)	Screening, BLL, risk factors, number, percent by state, town, year
MA	Childhood Lead Poisoning Prevention Program	Surveillance reports: screening, prevalence, maps, by year, town
NH	Healthy Homes and Lead Poisoning Prevention Program NH DHHS Data Portal	Screening, prevalence, maps, by year, state, town
RI	Lead Poisoning Information	Incidence, prevalence, by year, town
VT	Childhood Lead Poisoning | Vermont Department of Health (healthvermont.gov)	BLL, Unavailable online email: AHS.VDHVTEPHT@vermont.gov

https://data.ct.gov/stories/s/thcy-jjkv

CT DATA

Developers Suggest a Dataset Help About Sign In

Connecticut Childhood Lead Poisoning Surveillance Report

Home | Screening | Prevalence | Incidence | Health Disparities | Exposure Sources | Top 5 Cities | About the Data

Overview

Blood lead levels as low as 5 µg/dL have been shown to affect IQ, concentration, and academic achievement. Children who are diagnosed with a blood lead level of ≥5 µg/dL are considered to be lead poisoned. In 2013, the CT DPH lowered the case management action level from 10 µg/dL to 5 µg/dL to correspond with the Centers for Disease Control and Prevention (CDC) reference value. In May 2012, the CDC recommended a new "reference value" of 5 µg/dL, for lead poisoning among young children. The State of Connecticut adopted the new reference value in May 2013. As such, Connecticut local health departments (LHDs) are required to initiate public health case management actions for children with a confirmed blood level of ≥5 µg/dL. In October 2021, the CDC further reduced the recommended "reference value"to 3.5 µg/dL. This report defines 5 µg/dL and greater as an elevated blood lead level for CY 2020.

The current reference value is based on children aged 1 to 5 years old who were in the highest 2.5% of children tested for lead in their blood by CDC's National Health and Nutrition Examination Survey (NHANES).

Connecticut's Story

CT data: Screening, incidence, prevalence, number, percent by state, town

Childhood Lead Poisoning Surveillance - Prevalence | Connecticut Data

https://data.mainepublichealth.gov/tracking/lead

Maine Tracking Network

Contact | News

Search tracking Search

Home | News & Success Stories | Tools & Resources | About Us

Home → Childhood Lead Poisoning

Childhood Lead Poisoning

Lead has been banned in most consumer goods for decades, but old lead paint is still found in many of Maine's older homes, making it a persistent health threat. Tracking lead poisoning data and risk factors such as age of housing and poverty levels allow us to identify areas in need of public health interventions and evaluate prevention efforts.

What data are available?

Maine tracks the following measures associated with childhood lead poisoning:

- Lead Poisoning
- Blood Lead Testing (screening)
- Risk Factors (pre-1950 housing and poverty)

Poisoning | Testing | Comparison Maps | High-risk Areas | Town Data | Tables | About the Data

Lead Poisoning

These displays present information on the estimated number and percent of children with a confirmed blood lead test ≥5 µg/dL. Under Maine law, lead poisoning is defined as a blood lead level of 5 µg/dL or higher. Estimated numbers and percents are calculated from total number of children with confirmed blood lead test ≥5 µg/dL plus 38% of children with unconfirmed tests 5-<10 µg/dL. The conversion factor of 38% is based on the historically observed percent of unconfirmed test results of 5-<10 µg/dL that have a confirmatory venous test result ≥5 µg/dL.

Trends by Age | By County and Year | Maps by Year

Location: Statewide | Age Group: <3 years | Measure: Percent

Maine (Statewide): Children with a Blood Lead Level ≥5 ug/dL

ME data: Screening, BLL, risk factors, number, percent by state, town, year

Childhood Lead Poisoning | MaineTracking Network (mainepublichealth.gov)

https://www.mass.gov/orgs/childhood-lead-poisoning-prevention-program

An official website of the Commonwealth of Massachusetts Here's how you know

Menu | Contrast Settings | State Organizations | Log In to...

Mass.gov

Search Mass.gov SEARCH

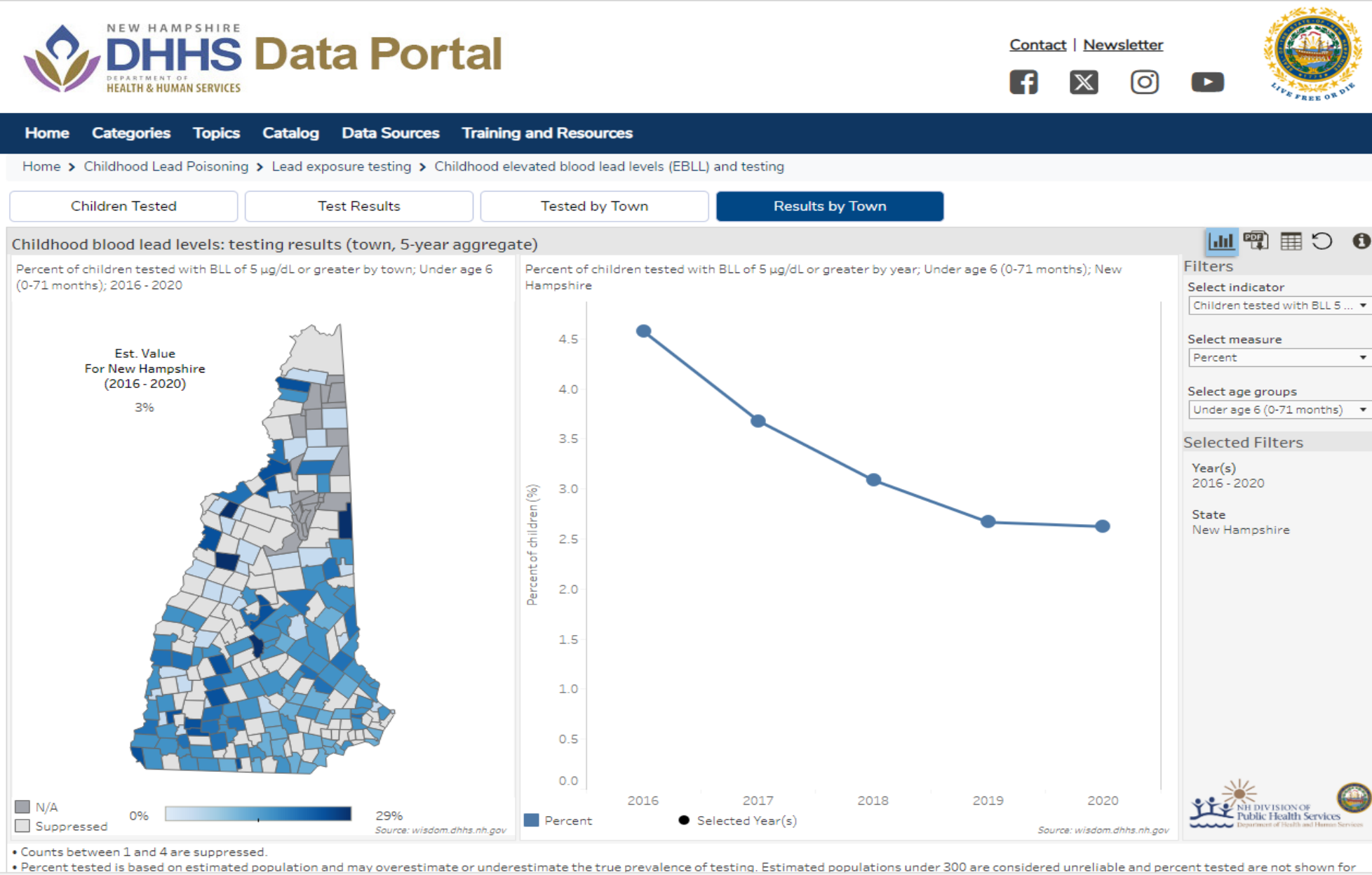
Executive Office of Health and Human Services > ... > Bureau of Climate and Environmental Health > Environmental Epidemiology Program

Childhood Lead Poisoning Prevention Program (CLPPP)

Contact us | Who we serve | I want to... | Topics | News | Search this organization

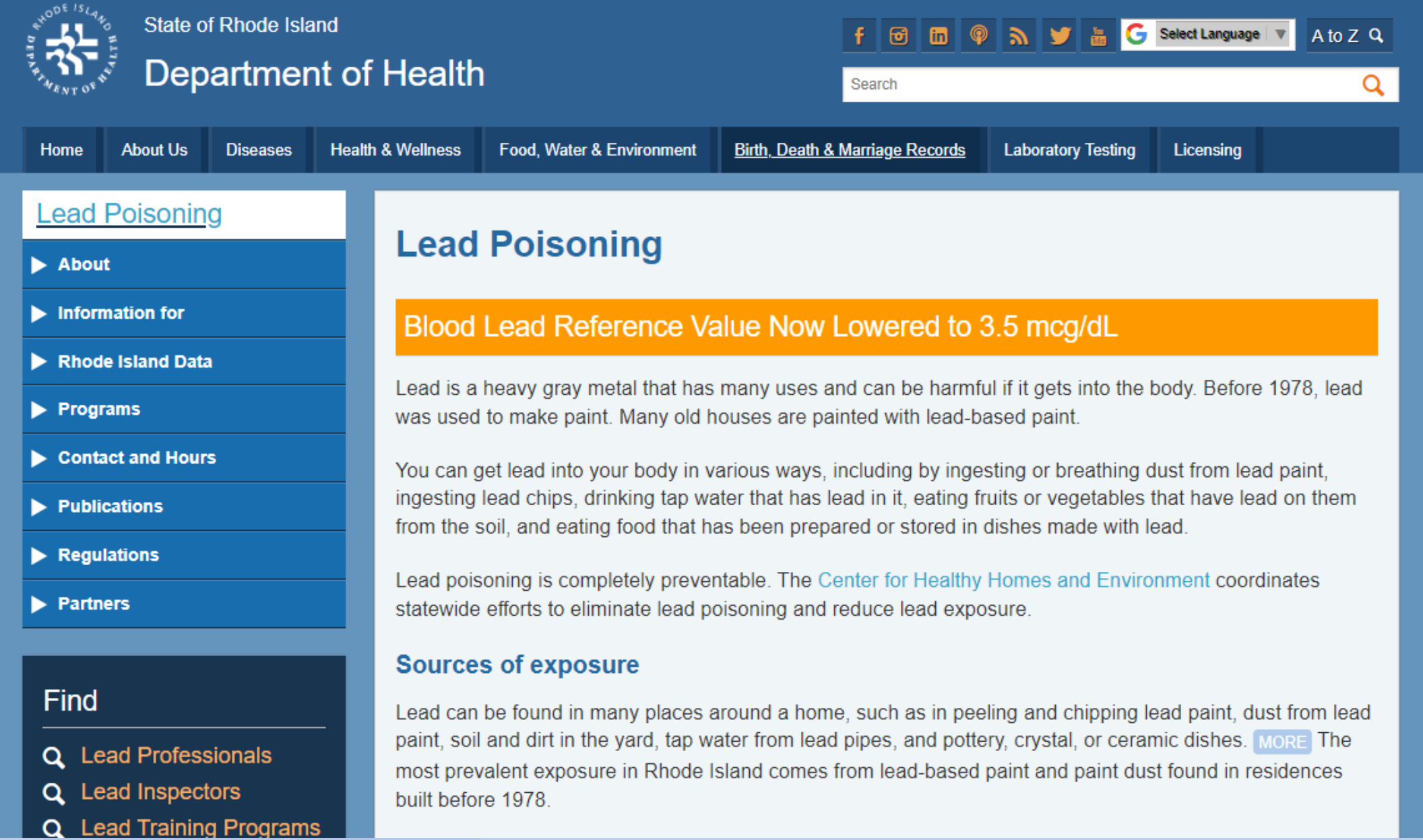
We help prevent, screen, diagnose, and treat childhood lead poisoning. We work to eliminate sources of poisoning through research and educational, epidemiological, and clinical and environmental activities.

MA Data: Surveillance reports: screening, prevalence, maps, by year, town
[Childhood Lead Poisoning Prevention Program]



NH Data: Screening, prevalence, maps, by year, state, town

[NH DHHS Data Portal]



RI Data: Incidence, prevalence, by year, town

Lead Poisoning Information

MENU VERMONT DEPARTMENT OF HEALTH

I am searching for...

Translations for you

Home / Health & The Environment / Environmental Public Health Data Tracking / **Childhood Lead Poisoning**

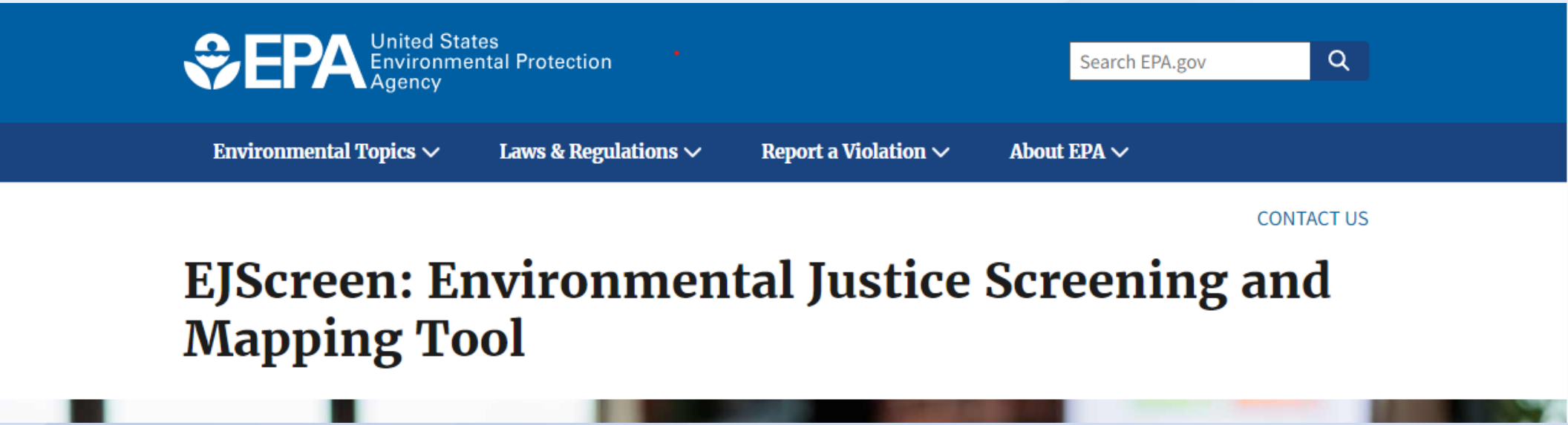
In the Environmental Public Health Data Tracking section:

Data Tracking in Action | Air Quality | Asthma | Birth Defects | Cancer | Carbon Monoxide | Chronic Obstructive Pulmonary Disease (COPD) | Climate and Health | Cyanobacteria (Blue-Green Algae) Tracker | Drinking Water | Heart Attacks | **Childhood Lead Poisoning** | Radon | Reproductive Health | Tick Tracker | Tools for Community Planners | Glossary

VT Data: BLL, Unavailable online email: AHS.VDHVTEPHT@vermont.gov

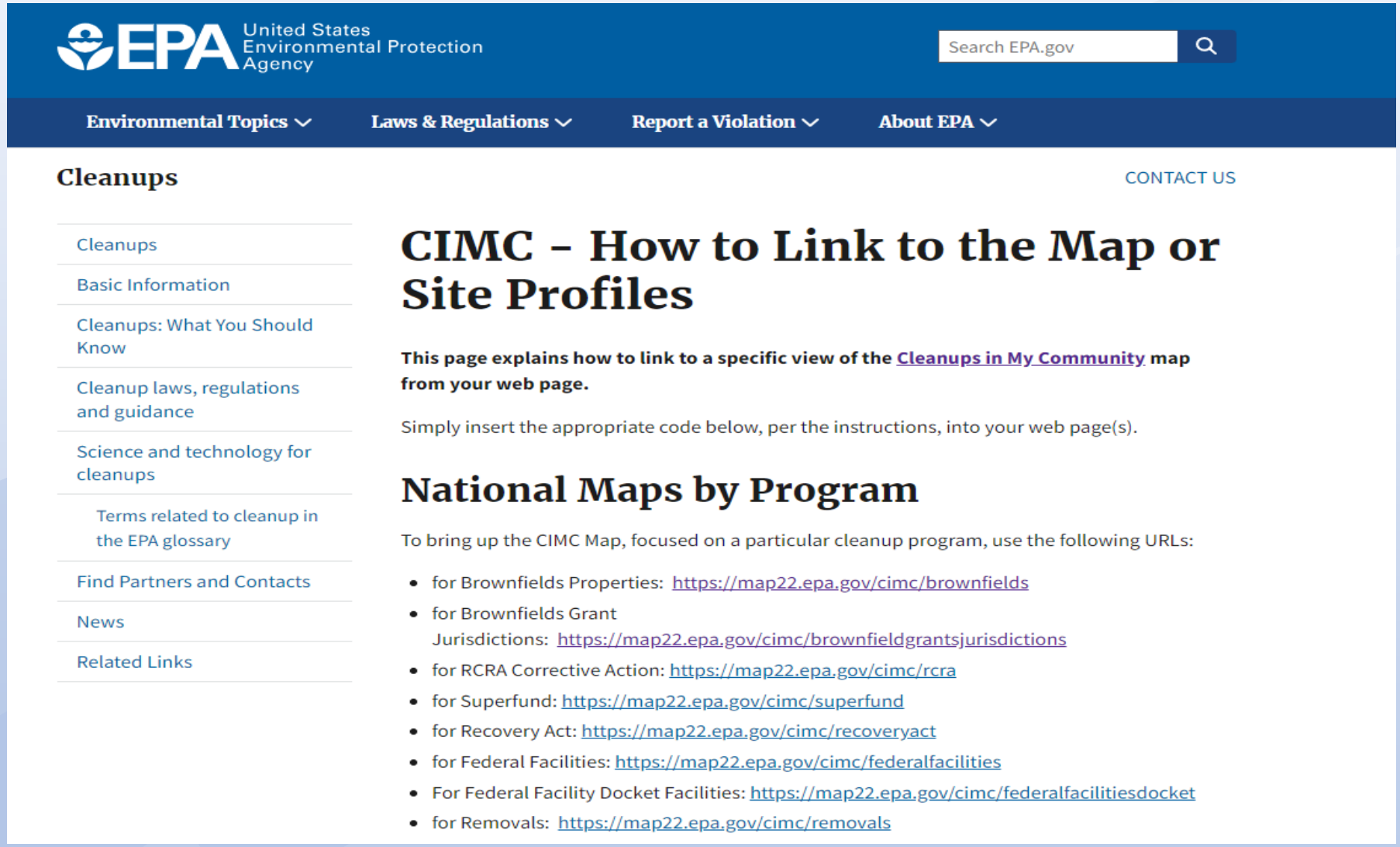
Childhood Lead Poisoning | Vermont Department of Health (healthvermont.gov)

EJScreen Indexes



- Environmental Justice Index
  - Lead paint: percent of housing units built pre-1960
- Supplemental Index
  - Lead paint: percent of housing units built pre-1960 and demographic variables
- EJScreen: Environmental Justice Screening and Mapping Tool | US EPA

Map of Brownfields



EPA United States Environmental Protection Agency

Search EPA.gov

Environmental Topics | Laws & Regulations | Report a Violation | About EPA

Cleanups

CONTACT US

- Cleanups
- Basic Information
- Cleanups: What You Should Know
- Cleanup laws, regulations and guidance
- Science and technology for cleanups
  - Terms related to cleanup in the EPA glossary
- Find Partners and Contacts
- News
- Related Links

CIMC – How to Link to the Map or Site Profiles

This page explains how to link to a specific view of the Cleanups in My Community map from your web page.

Simply insert the appropriate code below, per the instructions, into your web page(s).

National Maps by Program

To bring up the CIMC Map, focused on a particular cleanup program, use the following URLs:

- for Brownfields Properties: https://map22.epa.gov/cimc/brownfields
- for Brownfields Grant Jurisdictions: https://map22.epa.gov/cimc/brownfieldgrantsjurisdictions
- for RCRA Corrective Action: https://map22.epa.gov/cimc/rcra
- for Superfund: https://map22.epa.gov/cimc/superfund
- for Recovery Act: https://map22.epa.gov/cimc/recoveryact
- for Federal Facilities: https://map22.epa.gov/cimc/federalfacilities
- For Federal Facility Docket Facilities: https://map22.epa.gov/cimc/federalfacilitiesdocket
- for Removals: https://map22.epa.gov/cimc/removals

- CIMC - How to Link to the Map or Site Profiles | US EPA

Lead Laws and Regulations | US EPA

Lead is a pollutant regulated by many laws administered by EPA, including:

- Toxic Substances Control Act (TSCA)
- Residential Lead-Based Paint Hazard Reduction Act of 1992
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Safe Drinking Water Act (SDWA)
- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)