Bunker Hill Superfund Site
2017 Blood Lead Levels

Panhandle Health District
Idaho Department of Environmental Quality
United States Environmental Protection Agency

2017

Lead Health Intervention Program (LHIP) Annual Blood Lead Surveys

- Public health service offered by the State
- Not a study or experiment
- Box since 1974/1985
- Basin since 1996

Panhandle Health District
Lead Health Intervention Program

- **Public health service offered to those that live within the Box or the Coeur d'Alene River Basin and are between 6 months and 6 years of age.**

- **$30.00 cash incentive for participants.**

- **Prior to blood draws, the parent/legal guardian or adult participant must sign a Consent Form and complete the appropriate Questionnaire.**

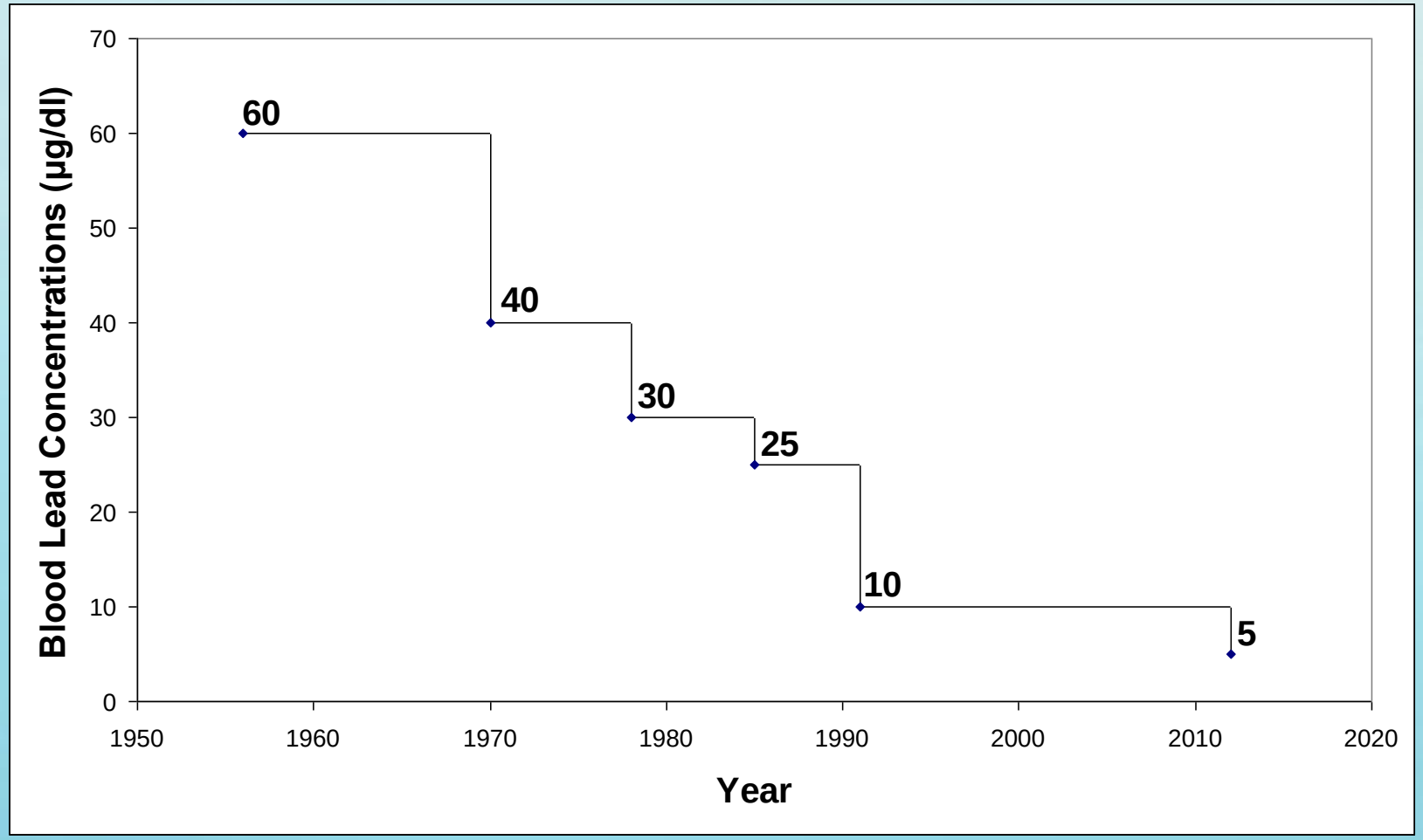
Panhandle Health District LHIP Procedures

- Screening blood test is done by skin puncture (capillary or fingerstick - FS)
- Results of capillary test are provided to the participant or parent immediately after analysis
- All FS results over 5 µg/dL are followed up with a venous draw conformation test
- Offer consultations and follow-up with all children who test over 5 µg/dL

“ The health effects associated with lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in the body, especially the nervous system. No safe level of lead exposure has been identified.”

– Centers for Disease Control and Prevention

Decreasing “elevated” blood lead levels



Blood Lead Concentrations Considered to be Elevated by the Centers for Disease Control and Prevention.

*N Engl J Med 2003; 348: p1517-26 (1950 – 1991)

*CDC. Recommendations in “*Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention*”. (2012)

Route of Exposure

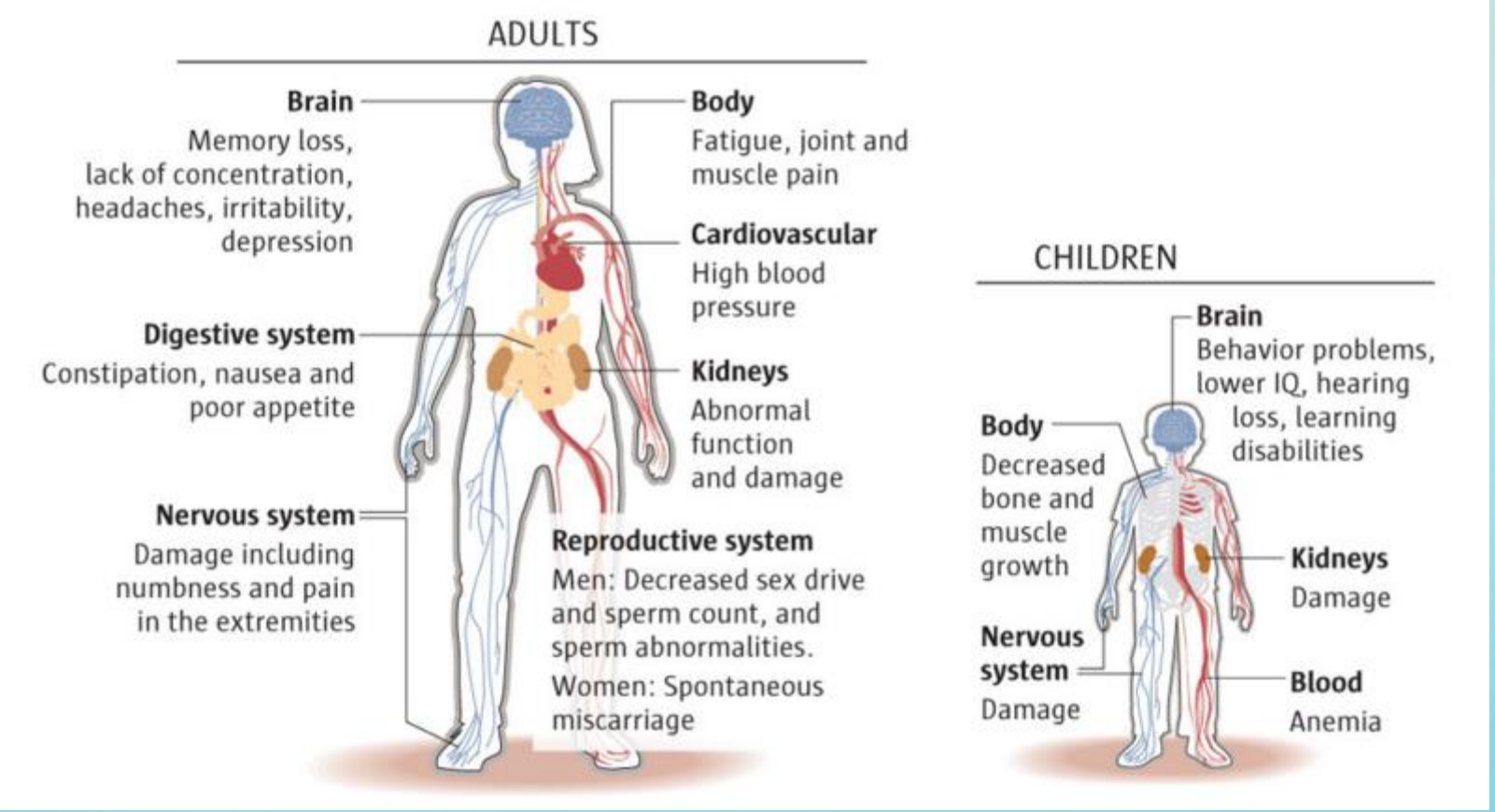
- Ingestion – Most common exposure route. Absorption rate of 20-60% (ATSDR 2007)
- Inhalation – Almost all lead that is deposited in the lungs is absorbed into the body (ATSDR 2007)
- Blood serves as the initial receptacle of absorbed lead and essentially distributes throughout the body. Making it available to all soft tissue organs.

Reference: Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological profile for Lead. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

At Risk Populations

- Children – more affected by lead due to behavior & physiology
- Pregnant women – Readily crosses the placenta adversely affecting fetus
- Adults with cumulative exposure – Generally occupational or hobby related
- Genetically pre-disposed individuals

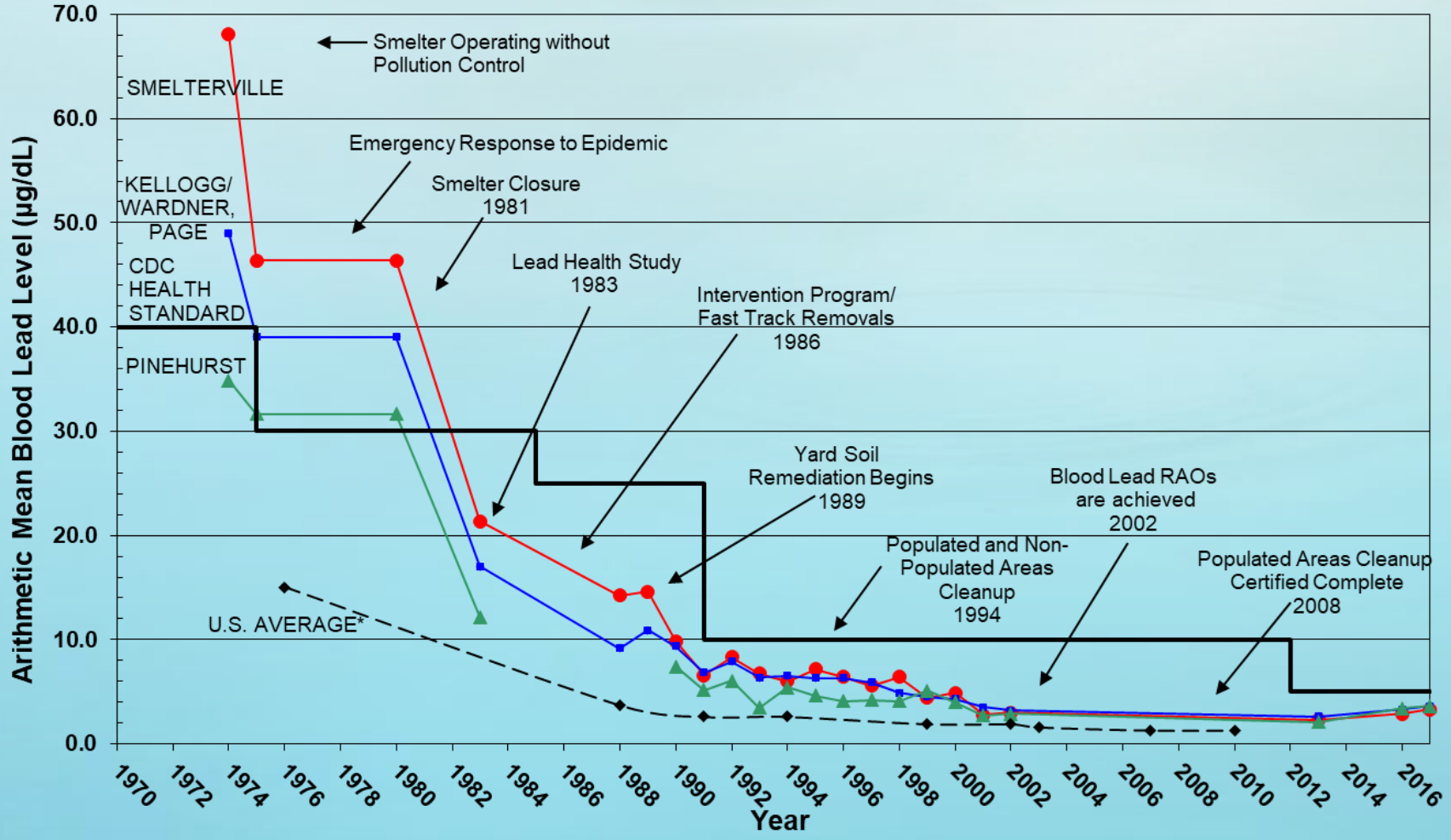
Health Effects



Health Effects – Children vs. Adults

- Children suffer effects from lead exposure at much lower levels
- No safe blood lead threshold for the adverse effects of lead on infant or child neurodevelopment has been identified
- Latent effects of lead exposure during childhood for adults
- Because lead exposure often occurs with no obvious symptoms, it frequently goes unrecognized
- A blood lead test is the best tool for identifying lead exposure

Bunker Hill Box Average Blood Lead: 1974-2017



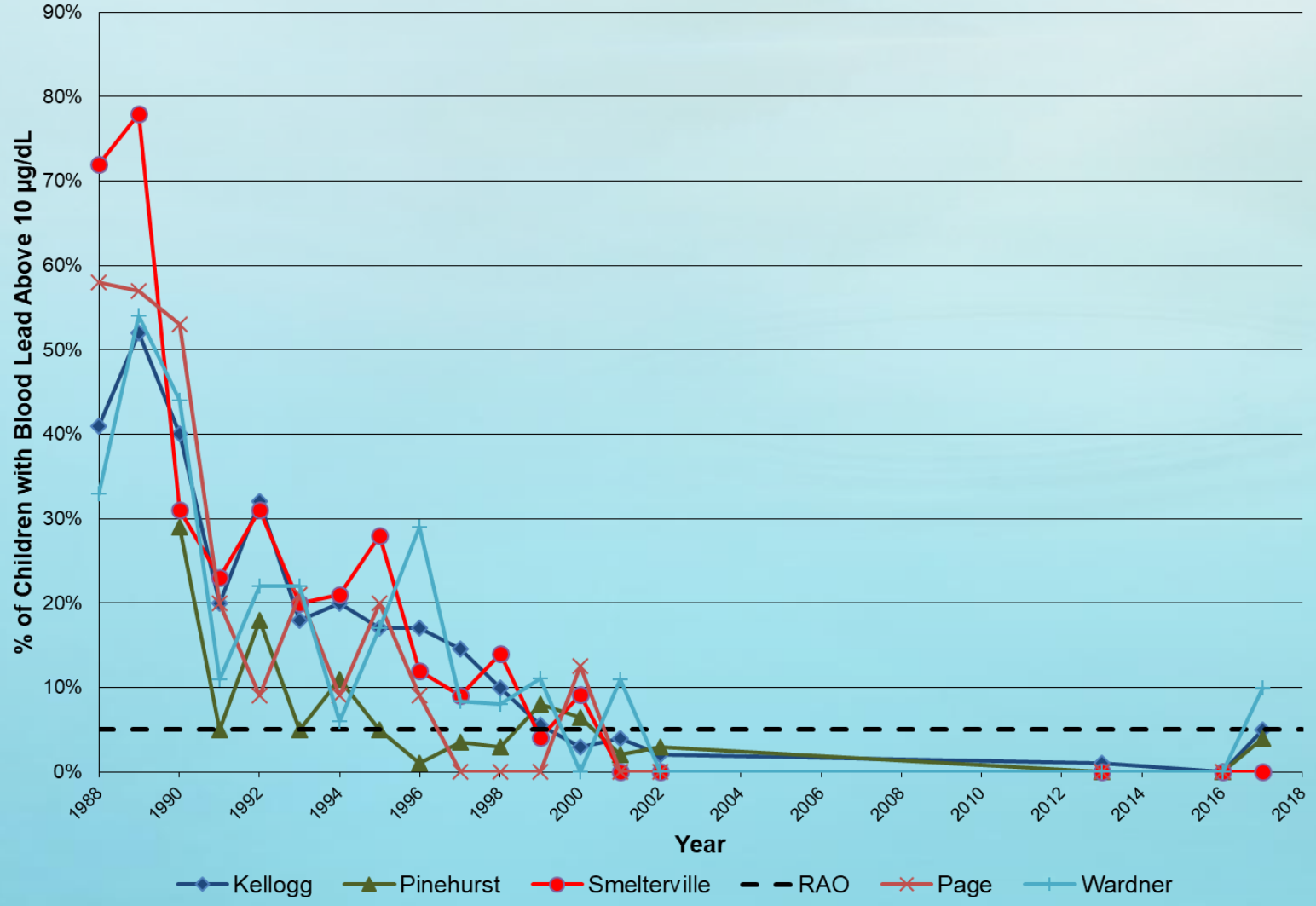
*Ref.=(Mahaffey et al. 1982; Pirkle et al. 1994; Pirkle et al. 1998 ; Lofgren et al. 2000; CDC 2013)

Box

Box
Remedial Action Objectives

- No more than 5% of children in each community have blood lead levels ≥ 10 µg/dL
- Less than 1% with blood lead levels ≥ 15 µg/dL

Percent of Box Children with Blood Lead Levels ≥10 µg/dL by City, 1988-2017



Note: Data from 2003 through 2012, 2014, and 2015 are not displayed because there were few participants.
Since 1998, there have been ≤10 participants per year from Page and Wardner.

2017 Blood Lead Summary Statistics: Box (age 0-6)

Total Number of Children (N)	124
Minimum (µg/dL)	1.4
Maximum (µg/dL)	13
Average (µg/dL)	3.5
Standard Deviation	2.2
Geometric Mean (µg/dL)	3.0
Geometric Standard Deviation	1.7

	Number	**Percentage**
Children's blood lead ≥ 5 µg/dL	17	14%
Children's blood lead ≥ 10 µg/dL	5	4%
Children's blood lead ≥ 15 µg/dL	0	0%

2017 Blood Lead Summary Statistics: Box (other non-eligible children*)

Total Number of Children (N)	18
Minimum (µg/dL)	1.4
Maximum (µg/dL)	17
Average (µg/dL)	3.4
Standard Deviation	3.5
Geometric Mean (µg/dL)	2.7
Geometric Standard Deviation	1.8

	Number	**Percentage**
Children's blood lead ≥ 5 µg/dL	1	6%
Children's blood lead ≥ 10 µg/dL	1	6%
Children's blood lead ≥ 15 µg/dL	1	6%

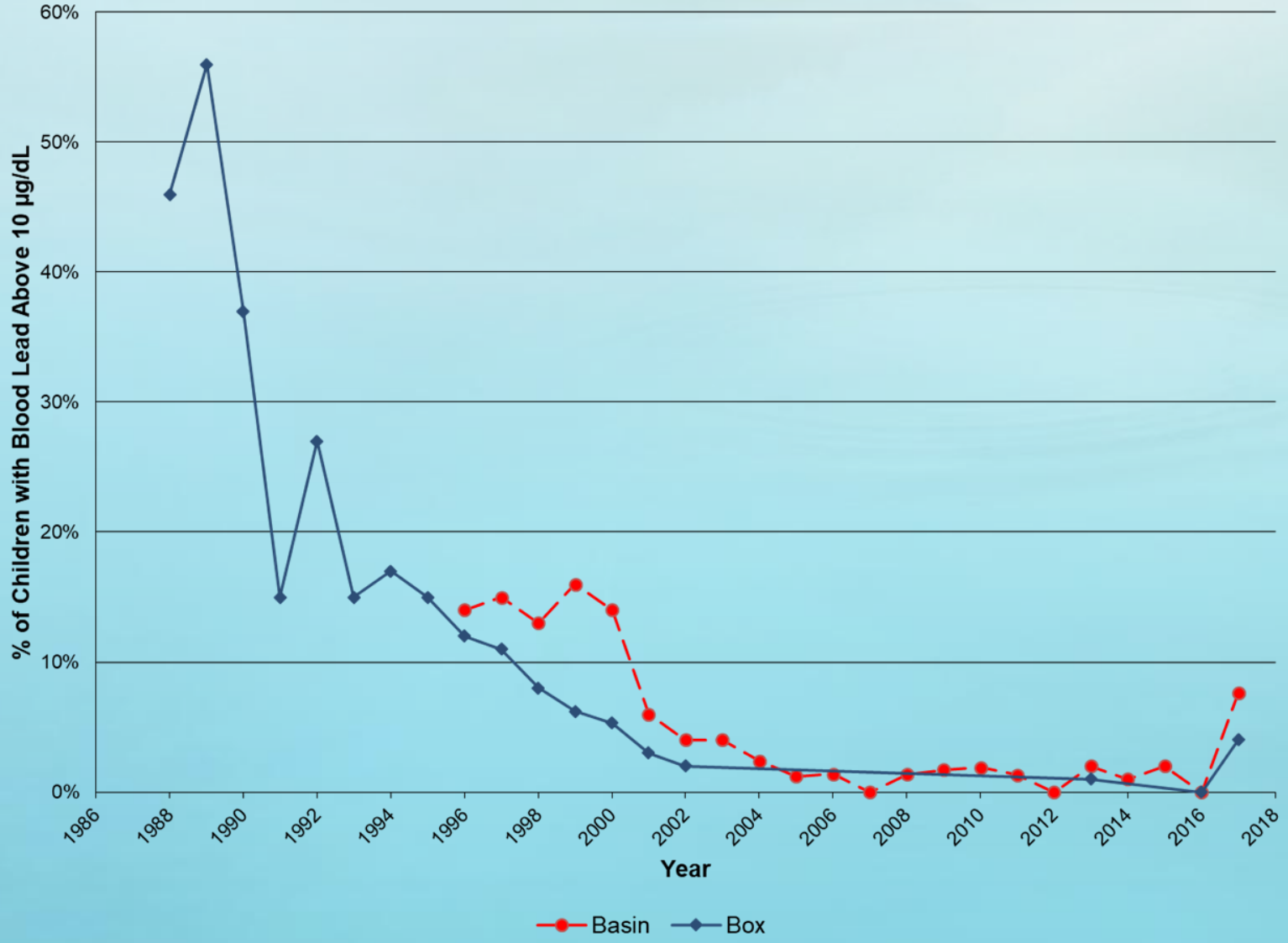
*age 7-14 years

Basin

Basin Remedial Action Objectives

- Reduce exposures to soils with concentrations greater than risk-based levels
  - Lead: ≥ 700 mg/kg
  - Arsenic: ≥ 100 mg/kg
- Reduce exposures to lead in house dust
- Cumulative exposures do not exceed USEPA's health risk goals
  - Lead: <5% chance that a typical child at an individual residence does not exceed 10 µg/dL

Percent of Children with Blood Lead Levels ≥10 µg/dL, Box and Basin, 1988-2017



Basin Blood Lead Levels by Year, 1996-2017

2017 Blood Lead Summary Statistics: Basin (age 0-6)

Total Number of Children (N)	105
Minimum (µg/dL)	1.0
Maximum (µg/dL)	20
Average (µg/dL)	4.3
Standard Deviation	3.4
Geometric Mean (µg/dL)	3.5
Geometric Standard Deviation	1.8

	Number	**Percentage**
Children's blood lead > 5 µg/dL	23	22%
Children's blood lead > 10 µg/dL	8	8%
Children's blood lead > 15 µg/dL	1	1%

2017 Blood Lead Summary Statistics: Basin (other non-eligible children*)

Total Number (N)	7
Minimum (µg/dL)	2.1
Maximum (µg/dL)	5.0
Average (µg/dL)	3.3
Standard Deviation	1.1
Geometric Mean (µg/dL)	3.2
Geometric Standard Deviation	1.4

	Number	**Percentage**
Blood lead > 5 µg/dL	1	14%
Blood lead > 10 µg/dL	0	0%
Blood lead > 15 µg/dL	0	0%

*age 7 -14 years

Contributing factors to higher numbers

- 2017 screening was 4 weeks later in the summer, leads to increased exposure time.
- Record high temperatures lead to increased recreation along un-remediated areas of CDA Basin. Especially the South Fork.
- Precipitation was well below average increasing dry dusty conditions.
- Overall participation increased. Significant increase in individuals making over $40,000 participated.
- Changing demographic of individuals raising children. Many were unaware if their yard had been remediated or that they were living in a Superfund site.

Weather – 2017 Temperatures

May

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE	DATE(S)
TEMPERATURE (F)						
RECORD						
HIGH	97	05/25/1928				
LOW	24	05/08/2002				
HIGHEST	90	05/30	MM	MM	82	05/03
LOWEST	35	05/13 05/01	MM	MM	38	05/20
AVG. MAXIMUM	68.0		66.4	1.6	69.5	
AVG. MINIMUM	46.1		43.8	2.3	47.6	
MEAN	57.0		55.1	1.9	58.6	
DAYS MAX >= 90	1		0.2	0.8	0	
DAYS MAX <= 32	0		0.0	0.0	0	
DAYS MIN <= 32	0		1.1	-1.1	0	
DAYS MIN <= 0	0		0.0	0.0	0	

June

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE	DATE(S)
TEMPERATURE (F)						
RECORD						
HIGH	105	06/28/2015				
LOW	33	06/01/1984				
HIGHEST	94	06/07	MM	MM	96	06/06
LOWEST	44	06/11	MM	MM	40	06/15
AVG. MAXIMUM	77.8		73.8	4.0	76.8	
AVG. MINIMUM	53.0		50.4	2.6	52.9	
MEAN	65.4		62.1	3.3	64.8	
DAYS MAX >= 90	2		1.0	1.0	7	
DAYS MAX <= 32	0		0.0	0.0	0	
DAYS MIN <= 32	0		0.0	0.0	0	
DAYS MIN <= 0	0		0.0	0.0	0	

July

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE	DATE(S)
TEMPERATURE (F)						
RECORD						
HIGH	108	07/26/1928				
LOW	37	07/08/1981				
HIGHEST	99	07/07	MM	MM	97	07/29
LOWEST	52	07/21 07/17	MM	MM	47	07/05
AVG. MAXIMUM	88.5		83.3	5.2	81.0	
AVG. MINIMUM	60.5		56.3	4.2	56.9	
MEAN	74.5		69.8	4.7	69.0	
DAYS MAX >= 90	14		7.2	6.8	7	
DAYS MAX <= 32	0		0.0	0.0	0	
DAYS MIN <= 32	0		0.0	0.0	0	
DAYS MIN <= 0	0		0.0	0.0	0	

August

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE	DATE(S)
TEMPERATURE (F)						
RECORD						
HIGH	108	08/04/1961 08/04/1928				
LOW	35	08/29/1965 08/31/1964				
HIGHEST	98	08/29	MM	MM	93	08/18 08/17 08/16
LOWEST	48	08/25	MM	MM	50	08/23 08/03
AVG. MAXIMUM	87.8		82.9	4.9	84.6	
AVG. MINIMUM	59.7		55.8	3.9	57.8	
MEAN	73.8		69.3	4.5	71.2	
DAYS MAX >= 90	16		6.6	9.4	10	
DAYS MAX <= 32	0		0.0	0.0	0	
DAYS MIN <= 32	0		0.0	0.0	0	

Weather – 2017 Precipitation

Kellogg (4831)
Idaho COOPERATOR PRECIP GAUGES Site - 2320 ft
Reporting Frequency: Monthly; Date Range: Jan 2017 to Jan 2018

(As of: Thu Jan 18 13:32:48 GMT-08:00 2018)
Provisional data, subject to revision

Date	Precipitation Increment (in)	Average Precipitation Increment (1981-2010) (in)	Precipitation Increment % of Average (1981-2010)
Jan 2017	3.10	4.06	76
Feb 2017		2.75	
Mar 2017	6.92	3.22	215
Apr 2017	5.09	2.90	176
May 2017		3.03	
Jun 2017		2.64	
Jul 2017	0.08	1.22	7
Aug 2017	0.22	1.16	19
Sep 2017	1.77	1.55	114
Oct 2017	3.13	2.80	112
Nov 2017	4.29	4.69	91
Dec 2017		3.73	
Jan 2018		4.06	

Regional Data*

May 2017	1.31	43%
June 2017	.71	27%

*National Weather Service - http://w2.weather.gov/climate/index.php?wfo=otx

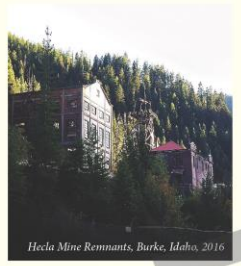
Identified Sources

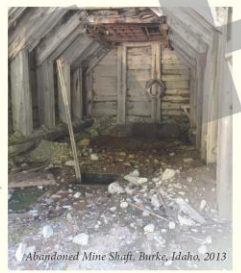
- Disturbed Barriers
- Strong recreational link
- Occupational
- Antique jewelry
- Lead based paint products

New Signage

Welcome to Burke


Burke, Idaho, circa 1891


Hecla Mine Remnants, Burke, Idaho, 2016


Abandoned Mine Shaft, Burke, Idaho, 2013

In 1887, the mining town of Burke, Idaho, bustled with activity. More than 800 residents made good use of 17 saloons, a beer tavern, and five boarding houses - two for the men, three for the young ladies. Commerce prospered at four general stores, two hardware stores, and a butcher, fruit store, sweets shop, bakery, livery stable, and furniture shop - not to mention two mines and a concentrator! By the early 1900s, more than 1,200 residents called Burke home.

In its heyday, 300+ buildings lined the narrow canyon, 300 feet wide at center. The Tiger Hotel squeezed in by running a creek, road, and rail line through the building! Sadly, a deadly fire razed the hotel in 1896.

In 1923, a fire consumed the town. Adding to the disaster tally, avalanches and floods took their own share of lives and property. By the 1940s, the rail lines were pulled up, and most businesses closed. The taverns were the last to go.


Hecla Mill, 1909


Burke, Idaho, Mid-1900s


Hecla Mine Remnants, 2016


Tiger Hotel, Burke, Idaho, 1888

Play Safe. Protect Your Health.

Mining sites and the areas around them can have high concentrations of lead, arsenic, and other heavy metals in the soils. Wash your hands and face after visiting the area. *Follow these safety tips and have fun in this historic mining area!*

- Stay on trails and off mine tailing piles.
- Stay out of old mines, mining structures, and buildings.
- Wash your hands with clean water or wipes before eating or drinking.
- Do not smoke at site—dry wood is extremely flammable.
- Eat at a table or on a blanket, not on the ground.
- Avoid the creek for swimming or washing hands.
- Wear proper off-road gear including dust protection.
- Remove dirt from clothes, toys, pets, cars, and equipment. Dirt tracked home may result in future lead exposure.

Please respect private property.

Idaho Department of Environmental Quality

Public Health
Prevent. Promote. Protect.

Panhandle Health District
Healthy People in Healthy Communities

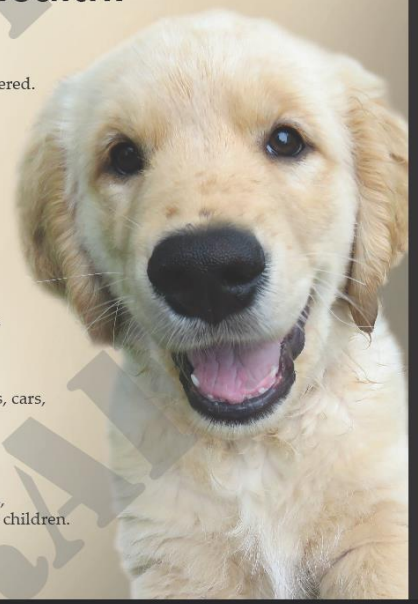
Contact PHD at:
(208) 783-0707
or visit: deq.idaho.gov/playclean

Public Health Signs

CAUTION

High levels of lead, arsenic, and other heavy metals from past mining activities are found in the soil, sediments, and water at this location.

Play Safe. Protect Your Health.



Pack in your water.
Don't use river water for drinking, cooking, or washing, even if it is filtered.

Wash before you eat.
Wash your hands and face with bottled water.

Eat on a clean surface.
Use a table or blanket, not bare ground.

Cover your face.
When off-roading, cover your nose and mouth with a bandana or mask to avoid breathing in dust.

Clean before you leave.
Remove dirt from clothes, toys, pets, cars, and equipment. Dirt tracked home may result in future lead exposure.

Follow fish advisories.
Follow fish consumption advisories, especially for pregnant women and children.

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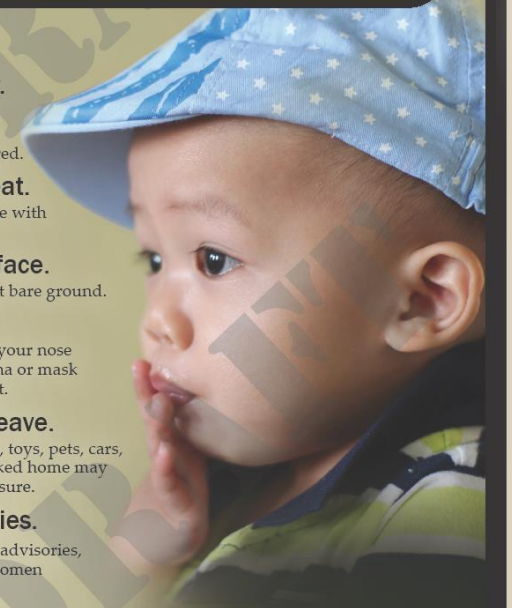

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- **Stay out of old mines, mining structures, and buildings.**
  Abandoned buildings, mining structures, and mine openings are dangerous due to rotting wood, rusty nails, falling debris, unstable rock, open shafts, and oxygen-depleted air. Buildings and structures could collapse at any time. Stay out and stay alive.
- **Stay on trails and off mine tailing piles.**
- **Wash your hands with clean water or wipes before eating or drinking.**
- **Do not smoke at site—dry wood is extremely flammable.**
- **Avoid the creek for swimming or washing hands.**
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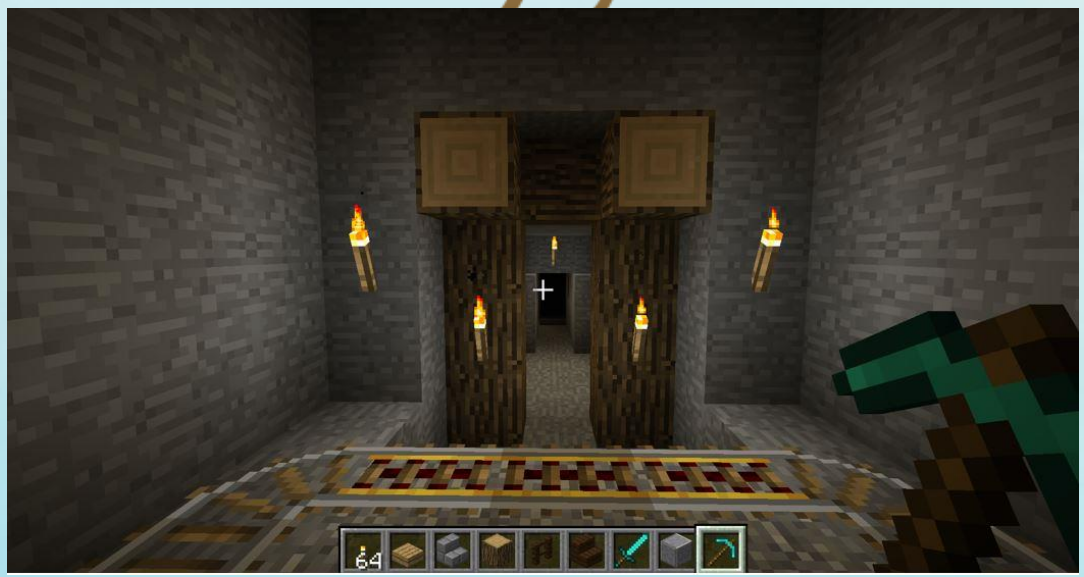
University of Idaho



Would like to thank Roger Lew, Austin Baymen, and Dylan Luchini

DEPARTMENT OF ENVIRONMENTAL & OCCUPATIONAL HEALTH SCIENCES
UNIVERSITY of WASHINGTON · SCHOOL OF PUBLIC HEALTH

Pediatric Lead Exposure: Diagnosis, Management & Prevention

On-Demand Webinar

http://www.pehsuclassroom.net/lms/index.php?r=course/details&id=77

With the Bunker Hill Superfund Site as a case study, this CME-approved training will highlight the importance of pediatric lead screening and review the standard of care for children with elevated blood lead.

WEBINAR INCLUDES:

Overview and History of the Silver Valley Bunker Hill Superfund Site
Andy Helkey, Panhandle Health District

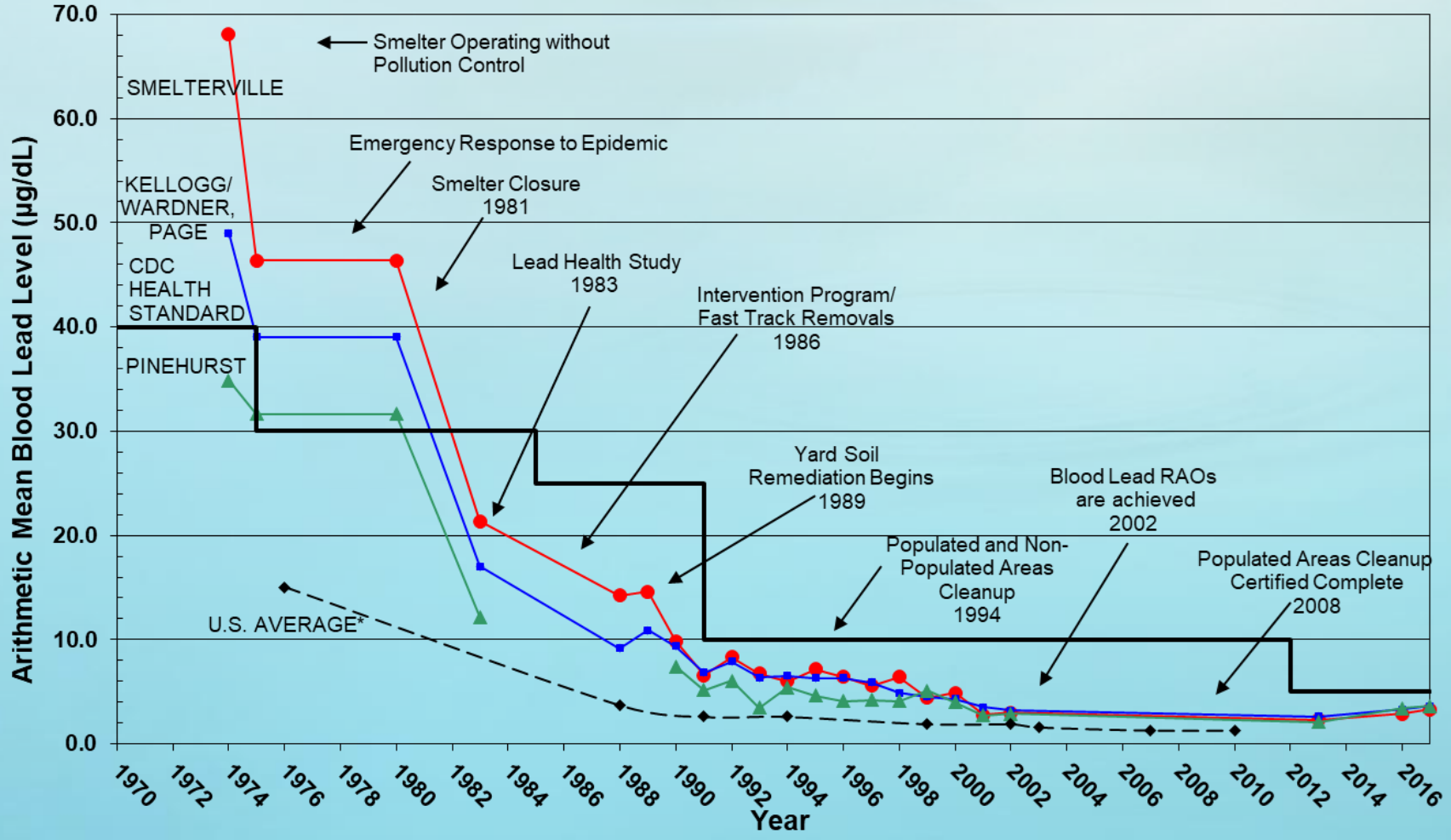
Pediatric Lead Exposure: Diagnosis, Management and Prevention
Ada Otter, DNP, ARNP, NW PEHSU

The NW Pediatric Environmental Health Specialty Unit seeks to reduce environmental health risks to children by providing training for health professionals, communities and families through consultation, educational activities, and referrals. NW PEHSU is part of a national network of pediatric environmental health experts funded by the CDC and ATSDR. Assistance in organizing the trainings was provided by the University of Washington Superfund Research Program, an interdisciplinary program that conducts and communicates research on the impacts of metal neurotoxicity on humans and ecological health

Sponsored by:
University of Washington
Northwest Pediatric Environmental Health Specialty Unit &
Superfund Research Program

Questions? Email: pehsu@uw.edu

Questions?



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