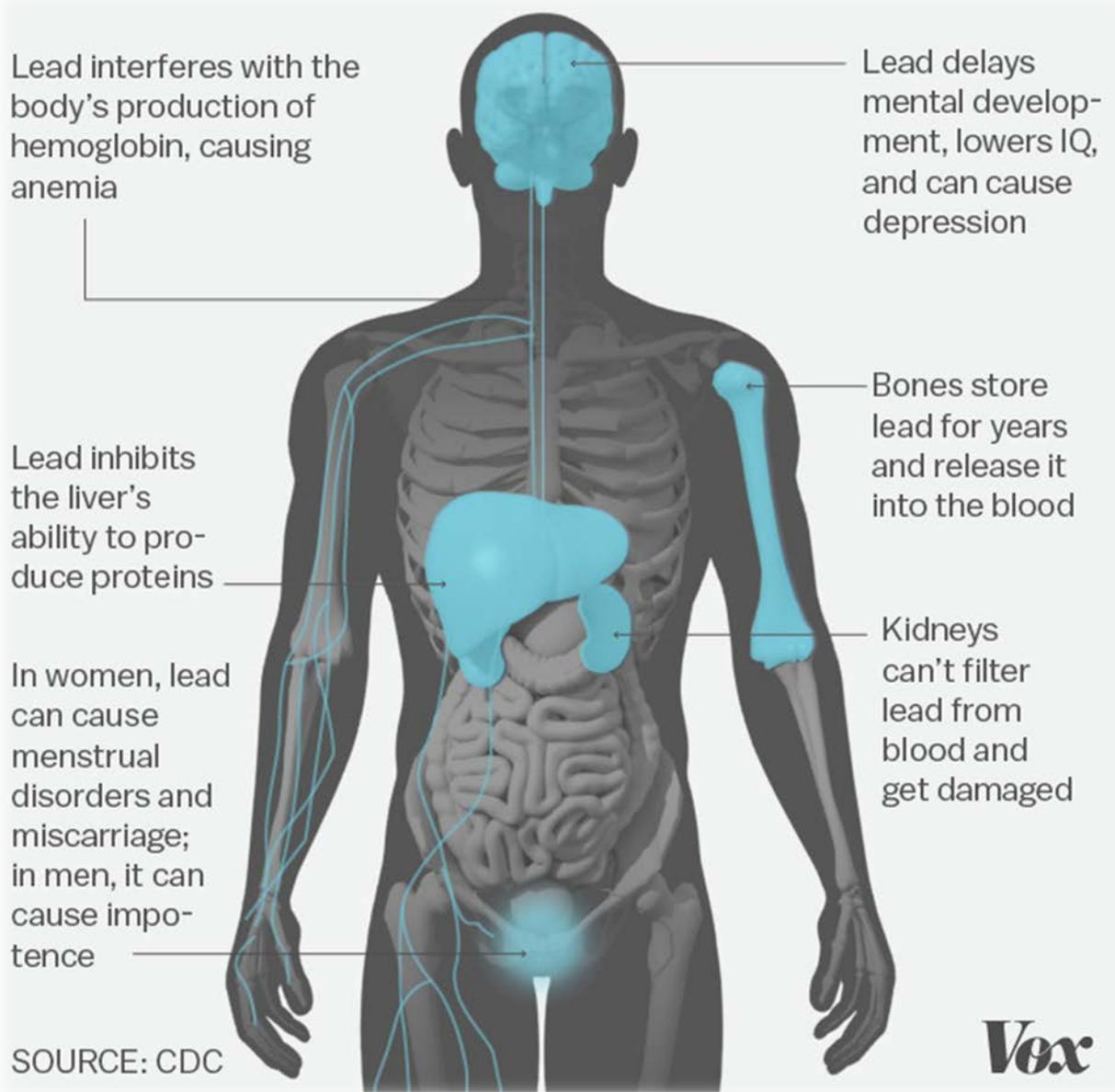




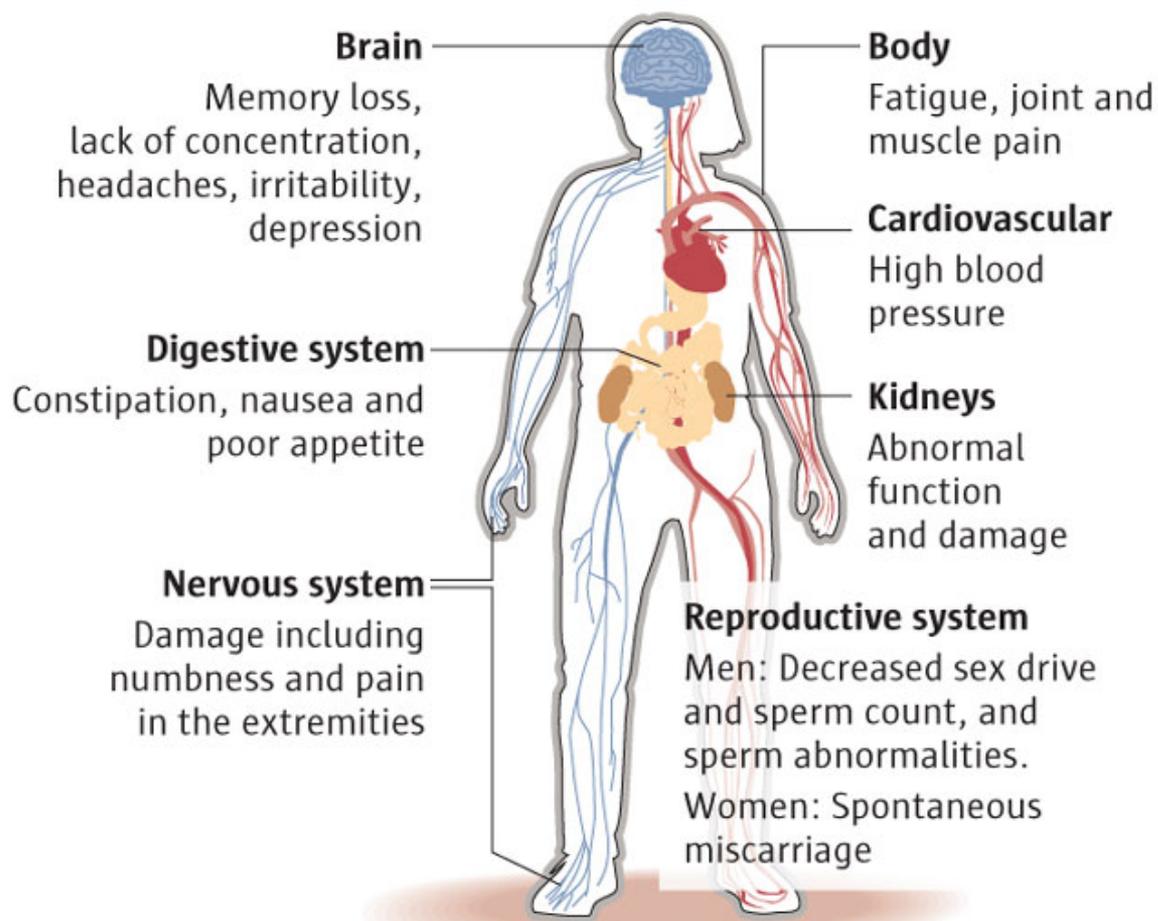
# Health Effects of Lead

- No known safe threshold
- Irreversible adverse effects on child's nervous system, growth and development, cognitive development, and behavior
- Effects every system in the body: kidneys, central nervous system, bone formation, reproductive system

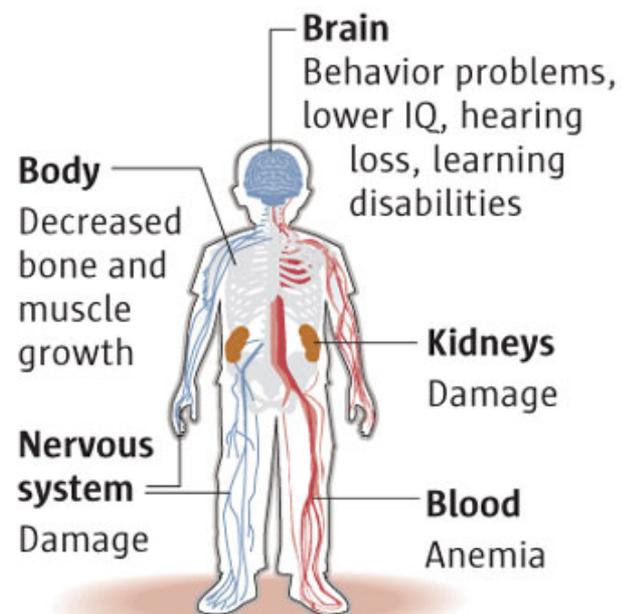




## ADULTS



## CHILDREN





# Children are Most Vulnerable

Children are affected differently than adults because:

- Per kilogram of weight, children consume more food (and dust & dirt) and inhale more air
- Children absorb more of the lead they are exposed to
- Young children exhibit more hand-to-mouth behavior; increasing their exposure

# How lead affects children's health

## Brain

Any exposure is linked to lowered **IQ, ADHD, hearing loss, and damaged nerves**. Acute exposures can cause convulsions, **loss of body movement, coma, stupor, hyperirritability, & death**.

## Heart

Studies suggest that adults who endured lead poisoning as children had significantly higher risks of **high blood pressure** 50 years later.

## Hormones

Lead disrupts levels of vitamin D, which can **impair cell growth, maturation, and tooth and bone development**.

## Blood

Lead inhibits the body's ability to make hemoglobin, which can lead to anemia. This reduces oxygen flow to organs, causing **fatigue, lightheadedness, rapid heartbeat, dizziness, & shortness of breath**.

## Stomach

Severe lead exposure can create intense **abdominal pain and cramping**.

## Kidneys

Chronic exposures can cause chronic inflammation, which can lead to **kidney failure, bloody urine, fever, nausea, vomiting, drowsiness, coma, weight gain, confusion, rash, and urinary changes**.

## Reproductive System

A moderate exposure can not only **lower sperm count**, but also **damage them**. Chronic exposures can diminish the concentration, total count, and motility of sperm, though it's unclear how long these effects last after the exposure ends.

## Bones

Lead may impair development and the health of bones, which can **slow growth in children**.

# Exposures

- Three granules of lead dust are enough to elevate a child's blood lead level above the action level ( $\geq 5\mu\text{g}/\text{dL}$ )
- No known safe threshold for lead in water – many factors to consider: amount of water consumed, body weight, nutritional status, combined with other exposures



# Symptoms

- Most often there are **no obvious symptoms**
- At high levels: abdominal pain and cramping, anemia
- At extremely high levels: seizures, coma, and death

# Testing for Lead Exposure in Children

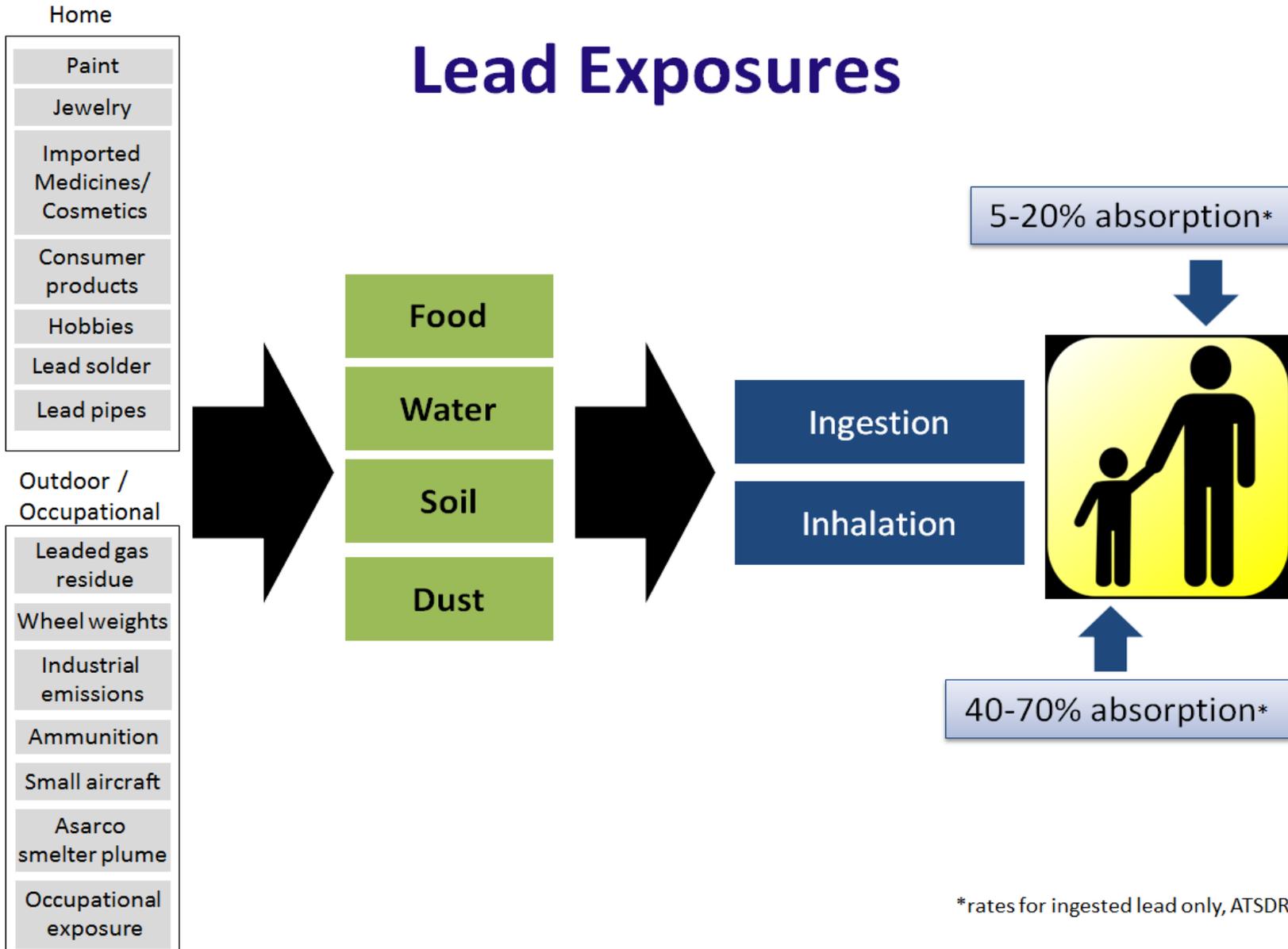
- Two methods for blood lead testing
  - Venous
  - Capillary



- Children at-risk should be screened by age 3 (recommended at 12 and 24 months)



# Lead Exposures



\*rates for ingested lead only, ATSDR

# Risk Factors for Lead Exposure

- Lives in or regularly visits any house built before 1950.
- Lives in or regularly visits any house built before 1978 that has recent or ongoing renovations or remodeling.
- From a low income family (defined as incomes <130% of the poverty level.)
- Has a sibling or frequent playmate with elevated blood lead level.
- Is a recent immigrant, refugee, or foreign adoptee.
- Has a parent or principal caregiver who works professionally or recreationally with lead.
- Uses traditional, folk, or ethnic remedies or cosmetics.

# RECOMMENDATIONS FOR BLOOD LEAD TESTING OF CHILDREN IN WASHINGTON STATE

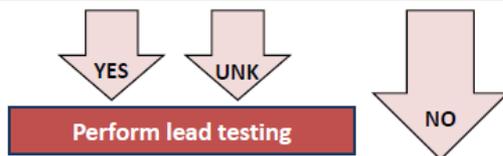
The Department of Health recommends screening children using the below algorithm at 12 and 24 months of age.

Does the child have any of the following risk factors:

- Lives in or regularly visits any house built before 1950.\*
- Lives in or regularly visits any house built before 1978 that has recent or ongoing renovations or remodeling.
- From a low income family (defined as incomes <130% of the poverty level.)\*\*
- Known to have a sibling or frequent playmate with elevated blood lead level.
- Is a recent immigrant, refugee, foreign adoptee, or child in foster care.
- Has a parent or principal caregiver who works professionally or recreationally with lead. (See sidebar for examples.)
- Uses traditional, folk, or ethnic remedies or cosmetics (such as Greta, Azarcon, Ghasard, Ba-baw-san, Sindoor or Kohl.)

\* Screening may not be indicated if the home has previously undergone lead abatement or tested negative for lead after remodeling.

\*\* Apple Health in Washington Medicaid covers children with family incomes up to 300% of the federal poverty level. If family income is unknown, testing should be offered.



Healthcare providers should consider testing child per clinical judgment, if:

- Parents have concern or request testing (including older children that have risk of exposure.)
- Child lives within a kilometer of an airport or lead emitting industry or on former orchard land.
- Child with pica behavior.
- Child with neurodevelopmental disabilities or conditions such as autism, ADHD, and learning delays.

Healthcare providers are encouraged to use the [Department of Health's Lead Risk Index Map](#) to better understand which areas in their community are at higher risk for lead exposure. See <https://fortress.wa.gov/doh/wtn/WTNIBL/>

Interpretation and Medical Management of Blood Lead Levels:

If blood lead level is  $\geq 5$  mcg/dL: See [PEHSU Recommendations on Medical Management of Childhood Lead Poisoning](#)

**LEAD RISK EXPOSURE EXAMPLES:**

Occupations and Hobbies:

- Remodeling and demolition
- Painting
- Work or visit gun range
- Mining, smelting, battery recycling
- Making lead fishing weights or ammunition
- Stained glass
- Soldering and welding

Consumer Products:

- Pottery or porcelain with lead glaze
- Informally imported foods, candies and spices
- Antique furniture and inexpensive jewelry



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# Data: Lead Reporting in Washington

## Lead is a Notifiable Condition

- All laboratories processing a lead test must send the results to DOH

## Data Limitations

- Non-Random Sampling
- Human Error
- False Positive/False Negative Tests

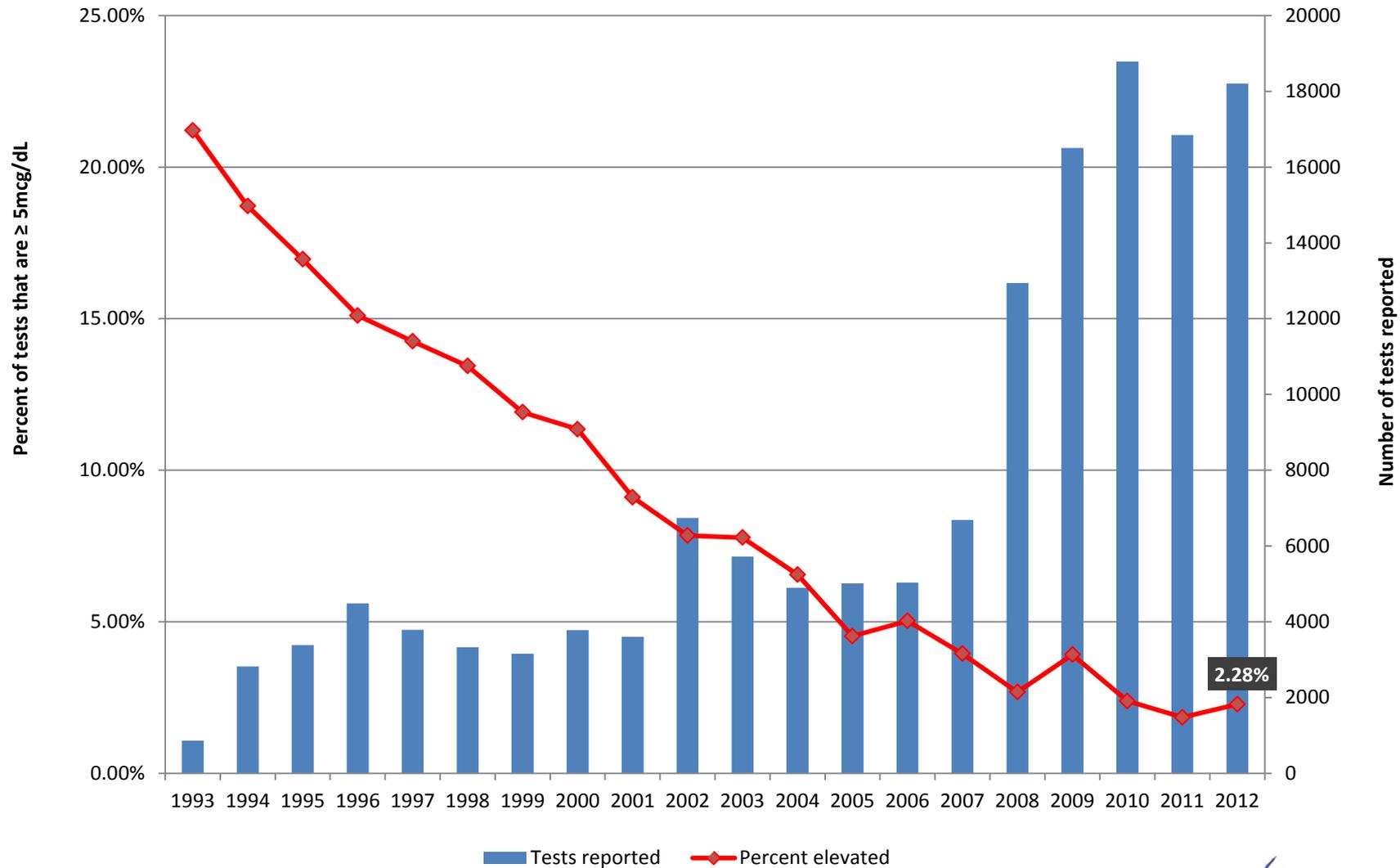


# Number and Proportion of Lead Level Screening Tests Reported in Washington in Children Under 6

Year	Number of tests reported for <6 year olds	Proportion of children screened
2012	17,811	3.4%
2011	16,442	3.1%
2010	18,343	3.5%
2009	16,062	3.0%
2008	12,945	2.4%
2007	6,684	1.3%

**Data:** Numerator – DOH Lead Surveillance data, Denominator – OFM

# Washington: Among Children under 6 who are tested, percentage who have reported blood lead levels $\geq 5$ mcg/dL



# Prevention

