Lead in school drinking water: Opportunities for improving public health in Iowa’s schools

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CHEEC: Who we are

Established through the 1987 Iowa Groundwater Protection Act, CHEEC is a multidisciplinary environmental health research center that supports and conducts research to identify, measure and study adverse health outcomes related to exposure to environmental toxins.
CHEEC: What we do

• Data Visualization & Dissemination
• Student Training & Professional Development
• Community-engaged Research Projects
Drinking water is an important, but often overlooked, source of lead exposure

- Lead is a potent neurotoxin that is harmful to human health
- Children are particularly vulnerable
- There is **no safe blood lead level** for children
- EPA estimates that drinking water can make up 20% or more of a person’s total exposure to lead
- Infants who consume mostly mixed formula can receive 40-60% of their exposure from drinking water

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**Lead in Drinking Water Guidelines & Regulations**

- **American Academy of Pediatrics**: 1 ppb^a
- **FDA**: 5 ppb^b
- **World Health Organization**: 10 ppb
- **EPA**: 15 ppb

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“For every $1 invested to reduce lead hazards in housing units, society would benefit by an estimated $17-$221, a cost-benefit ratio that is comparable with the cost-benefit ratio for childhood vaccines.” – AAP 2016
Unlike other contaminants, lead is derived from the distribution system and premise plumbing.
Why would Iowa be immune to this nationwide problem?
How did we get here?
A crash course in lead in water policy

1986
SDWA §1416 and §1417
Prohibits use of materials not “lead free”
“Lead free”: < 0.2% solders
<8% for pipes & fittings

1988
Lead Contamination Act (P.L. 100-572):

1991
Lead & Copper Rule (LCR) (40 C.F.R. Part 141 Subpart I)
Replaced a lead standard of 50 µg/L measured at the water utility
Non-health based “action level” of 15 µg/L (or ppb)

1996
Amendments to SDWA §1417

2011
Reduction of Lead in Drinking Water Act (P.L. 111-380)
Reduced allowable lead level in products in contact with drinking water to 0.25%

2016
WIIN Act (P.L. 114-322)
Public information, grants for repairs & testing (including schools)
What about schools?
Unless schools are their own public water system, they are not tested under the current LCR

US GAO: “…one of the most complex drinking water regulations under the SDWA”
WIIN provided separate grants for testing and repair of lead in school drinking water

- EPA grants to states in 2020 for lead testing
- Administered by the Iowa Department of Education
- $460,000 grant covers participation of up to 40% of public schools and child-care sites in Iowa
- Testing at 3 outlets per school or child-care sites
- Subsequent grant application for repair funds
EPA’s proposed revisions to the LCR would require testing in schools and child cares

- Community Water Systems (CWSs) must test at **20% of K-12 schools and licensed child cares every year**

- Samples from **5 outlets at each school and 2 outlets at each child care facility**

- Complete sampling at all schools and child care facilities in CWS distribution system every five years.

- Excludes facilities built after Jan 1, 2014
“Every school has lead in it, but not every water sample will.”

Dr. John Tobiason, Director, Massachusetts DEP 2016 School Testing Program
“There is no safe level of lead for children. EPA encourages schools to prioritize remediation efforts based on lead sample results and to use the steps in the toolkit to pinpoint potential lead sources to reduce their lead levels to the lowest possible concentrations”. (3Ts page 36)

“...schools and child care facilities should not use sample results from one outlet to characterize potential lead exposure from all other outlets in their facility. This approach could miss localized lead problems that would not be identified.” (3Ts page 31)
At least 27 states* are using 15 ppb (or higher) as “action level” for schools

- Alabama
- Arizona
- California
- Colorado
- Connecticut
- Hawaii
- Idaho
- Indiana
- Louisiana
- Maine
- Maryland
- Nebraska
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Dakota
- Tennessee
- Utah
- Washington
- Wisconsin

*Review of State websites ongoing; likely more as information is not readily available for many States

Assistance from Prof. Andrew Whelton, Purdue
CHEEC Grants to Schools Program

• Initiated Spring FY2019

• Free lead and copper testing Iowa elementary schools with older drinking water infrastructure

• Up to $10k/school for testing and to remove/replacement high priority drinking water outlets with unsafe levels of lead or copper.

• Comprehensive sampling of every outlet in each school.
What are we finding in Iowa schools?

• Oxford Junction
  • Sampled 41 water outlets on Saturday, April 27
  • Lead: 0 samples above EPA Action Level of 15 ppb, 2 above 5 ppb
  • **Copper: 8 equal to or above EPA Action Level of 1.3 mg/L**
  • Remediation: Signage & 3 new bottle fillers

• Anamosa
  • 129 water outlets for sampling on Saturday, May 18
  • **Lead: 1 sample above EPA Action level of 15 ppb**, 3 other locations between 3-8 ppb
  • Copper: 0 samples above EPA Action Level
  • Remediation: 1 new bottle filler & replacement of fixtures at 3 locations
What are we finding in Iowa schools?

• Keokuk
  • Sampled 137 water outlets on Saturday, October 19
  • **Lead: 5 samples above EPA Action level of 15 ppb**, 47 other locations between 1-14 ppb
  • Copper: 0 samples above EPA Action Level
  • Remediation: Fixture replacement, filters, no drinking at some outlets

• Dubuque
  • Sampled 105 water outlets on Saturday, December 21
  • **Lead: 5 samples above EPA Action level of 15 ppb**, 12 other locations between 1-8 ppb
  • Copper: 0 samples above EPA Action Level
  • Remediation: Fixture replacement

**Average of $2,800 per school for testing and remediation**
Opportunities exist to improve public health through school drinking water improvements

• Lower action level for lead in schools from 20 ppb to be more in line with EPA’s 3Ts guidance

• Financial assistance for expanded testing at all outlets in schools

• Technical and financial assistance to allow schools to respond effectively to testing results

• Ensure long-term safety of school drinking water (e.g., “Filter First” programs in Michigan)

• Leverage COVID funding to install bottle fillers with filtration
One final point on COVID: Stagnation increases lead and copper.
Thanks and questions

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