

The Lead Hazard and Aging Water Infrastructure



Martin M. Kaufman, University of Michigan-Flint



Lead as an Environmental Hazard

What is lead?

Naturally occurring metal present below the surface found in many ores, associated with zinc, copper, and silver

Where do humans come in contact with lead?

Paint, Ceramics, Pipes, Solders, Gasoline, Batteries, Cosmetics,

Common sources of lead exposure: Lead-based paint in older homes, Contaminated soil, Household dust, Drinking water, Lead-painted toys

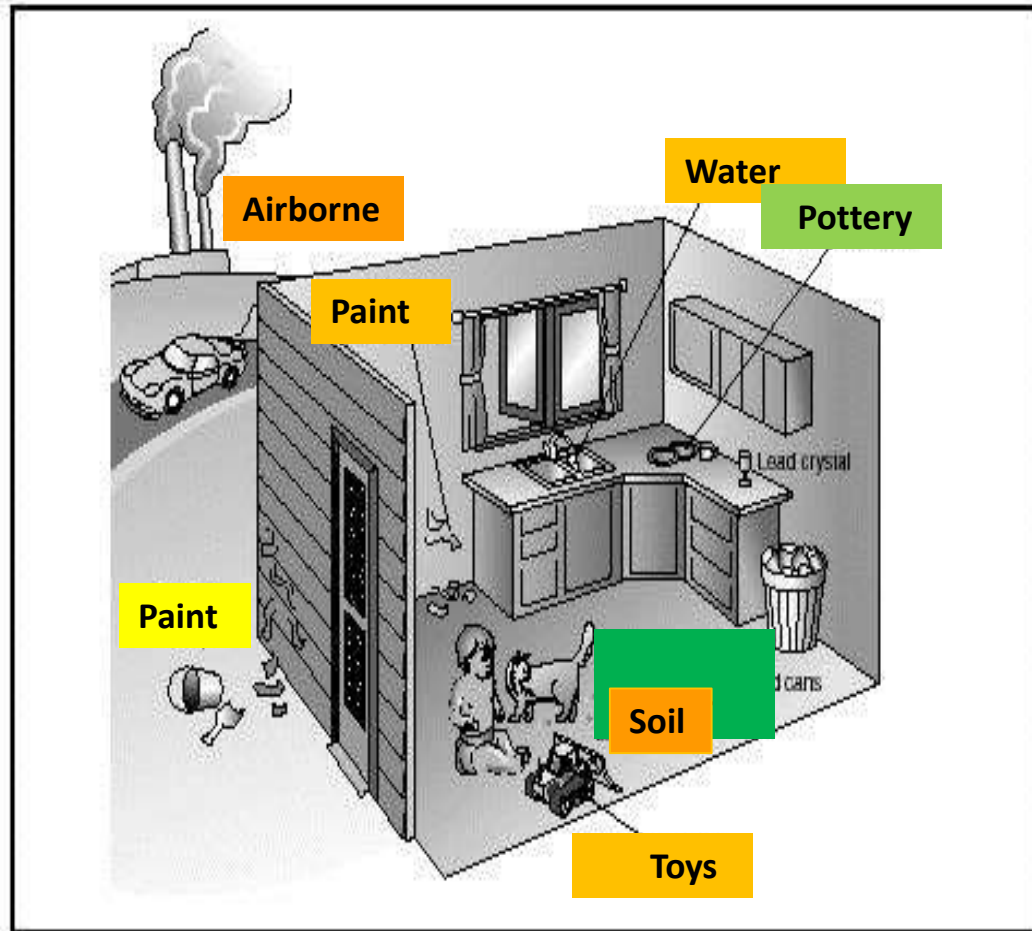
Exposure Pathways

Breathing, eating/drinking

Toxicity / Health effects

No amount of lead is safe / Decreased academic achievement, decreased IQ, decreases in specific cognitive measures, behavior problems, decreased kidney function, reduced fetal growth

Environmental Lead



And, brass fixtures, electrical devices grounded to water pipes, wells

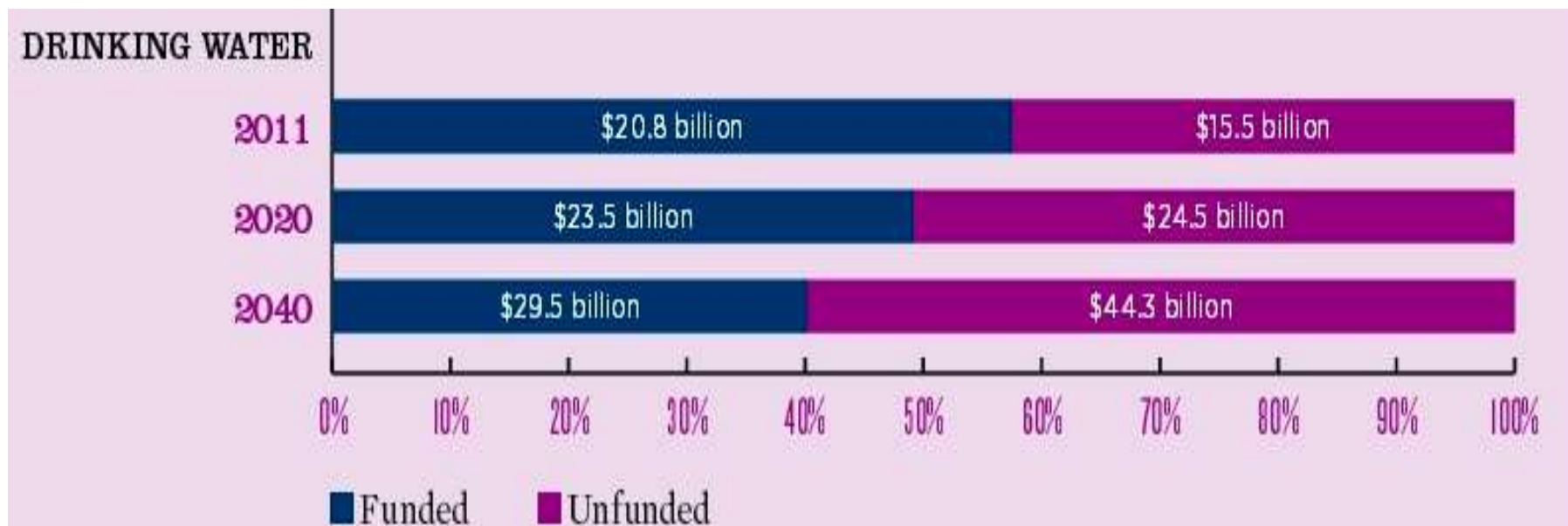
Current status of water distribution infrastructure...PIPES

Major pipe installations in the U.S. and their life-spans (AWWA, 2001)

Laid	Lifespan	Replacement
1880s	90-150 yrs	1970s-2030
1920s	100 yrs	2020s
1950s+	75 yrs	2025+

Current status of water distribution infrastructure...

FUNDING



SOURCES Needs calculated from EPA (1997a, 1997b, 2001, 2003, 2005, 2008, 2009, 2010). Spending calculated from CBO (2010) and USCB (2011a, 2011b). Consumer price index adjustment from BLS (2011). Projections by Downstream Strategies and EDR Group.

Lead in the U.S. Water Distribution System and in the Home

- 7 to 10 million homes have lead as a component of their water service line (USEPA 1984; AWWA, 2001)
- Older water mains built before 1950 with bell and spigot joints may contain lead
- Almost all homes built before 1986 have lead solder in their indoor pipes

...and from the U.S. Housing and Urban Development's Healthy Homes Survey of 2011:

- 37.1 million homes have lead paint
- 3.8 million homes have a significant soil lead hazard

...plus

- Tens of millions of homes have brass plumbing fixtures and fittings containing 8 percent lead

What are the next steps?

Are homes really safe if any lead is present? No.

Suggestions:

Demonstrate the long-term cost effectiveness of lead abatement through its health benefits, lower education costs, increased productivity, crime reduction, and greater tax receipts. What price can you place on public confidence?

Develop a comprehensive community involvement and scientific advisory framework for lead abatement.

Perform complete residential lead assessment and removal – more cost effective in the long-run. Implement for the most at-risk populations first. Flint, MI makes a good case here.