



MEMORANDUM

LEGISLATIVE REFERENCE BUREAU

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To: Ald. James A. Bohl, Jr.
From: Tea Norfolk, Legislative Fiscal Analyst – Lead
Date: August 26, 2016
Subject: Sources contributing to blood lead levels in people

This memo is in response to your request to provide the following information:

- What does research say about the sources of lead in children (or people generally)?
- What are the major sources (water, lead-based paint, ambient air, etc.)?
- What percentage comes from each source?

Sources of lead in children and other people

Lead can enter the human body through ingestion and inhalation. It cannot leach through the skin.

Based on a review of several different sources of information, the following are sources of lead that can end up being found in the human body:

- Old pipes leaching lead into city drinking water from both public infrastructure and water service pipe lines on private property
- Galvanized iron pipes
- Water service pipes constructed of lead
- Water service pipes using lead solder
- Lead solder connecting pipes in household plumbing
- Brass faucets, valves, or fittings
- Other lead plumbing fixtures inside the home
- Lead particles generated by burning materials containing lead, for example, during smelting, recycling, stripping leaded paint, and using leaded gasoline or aviation fuel
- Lead-contaminated dust
- Lead-contaminated food (acquired from lead-glazed or lead-soldered containers)
- Cosmetics
- Medications
- Healthcare products or folk remedies that contain lead
- Soil
- Dust
- Flaked-off paint

- Paint dust from walls, door frames, window frames, and furniture
- Leaded gasoline
- Lead crystal and lead-glazed pottery
- Toys
- Jewelry
- Clothing after working in a job where there is lead exposure

Major sources

Based on information from the Centers for Disease Control and Prevention (CDC) and a study by University of California Los Angeles' Institute of the Environment and Sustainability, the most common sources of lead exposure come from the following (listed in order from most common to least):

1. Lead-based paint (especially flakes and dust from windows (friction of opening and closing windows creates a lot of dust)
2. Soil (lead emitted by motor vehicles decades ago)
3. Lead water service pipes

Percentage from each source

I was unable to find definitive percentages for the sources of lead in blood lead levels because it is difficult to track the source of lead once it has entered the body. However, one article in *The News & Observer* quoted Ed Norman, head of the Children's Environmental Health division of N.C. Department of Health and Human Services, as saying the bulk of lead contamination cases come from lead paint and 20 percent relate to contaminated water. There was no citation as to where he acquired this figure, and it is the only place I have seen a percentage assigned.

Other information

In addition to providing information related to the above questions, the two attached articles discuss larger implications related to the lead-in-drinking-water issue, which I thought may be of interest to you. The first article from *Mother Jones* magazine contains information regarding the correlation between lead exposure and crime rates. The article makes a case for lead exposure being a primary factor in crime rates to a greater extent than other social factors. (See Drum, Kevin. "Lead: America's real Criminal Element." *Mother Jones*. February 11, 2016. *Motherjones.com*. Accessed August 25, 2016.) The second article from *USA Today* criticizes the current EPA rule, which is seen by some as not being adequately protective of public health. The article indicates that due to the testing and reporting requirements established by EPA, lead-contaminated water is a much greater problem than is being reported. (See Young, Alison and Mark Nichols. "Beyond Flint: Excessive lead levels found in almost 2,000 water systems across all 50 states." *USA Today*. *Usatoday.com*. Accessed August 25, 2016.)

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