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Alarming Levels of Lead in Water and Soil From Buried Cables

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STORY AT-A-GLANCE

- A Wall Street Journal (WSJ) investigation revealed a network of lead-covered cables across the U.S. leaching the heavy metal into the soil and water and raising lead levels well above EPA standards; roughly 330 are in a "source water protection area" designated for drinking water
- Originally installed by Bell Systems, the company was divided in 1984 as part of an antitrust lawsuit. The ensuing companies have denied ownership of the problem, denied the problem exists, denied it's a public health problem, abandoned the cables, or insisted that are integral to providing service nationwide
- After a 2021 lawsuit, AT&T agreed to clean up over 6 miles of lead cables from Lake Tahoe, which the company claims it no longer uses and is estimated to cost $1.5 million. However, cleanup has been repeatedly delayed for logistical issues
- Health risks from lead exposure are multigenerational as lead changes DNA and may affect several generations; exposure is linked to 18% of all deaths and 28.7% of all heart deaths, but doctors do not routinely draw lead levels
- Common sources of lead include drinking water, cigarette smoke, cheap household products and children's toys. Consider getting yourself and family tested for lead, test your water supply and use filtered cold water for drinking and cooking

Humans have had a long and intimate relationship with lead, dating back to the Roman Empire when it was used to create pipes for plumbing and to sweeten wine.[1] An

investigation by The Wall Street Journal has found miles of toxic lead cables around the U.S. that are continuing to poison the soil and water.[2]

Lead has a cumulative effect on multiple organ systems and is particularly harmful to young children.[3] After entering the body, it is distributed in the brain, kidney, liver and bones. According to the CDC,[4] there is no known safe blood level for children or adults. Children who are exposed to lead have an increased risk of damage to their nervous system, slowed brain and cognitive development, and hearing and speech problems.

Lead is a known neurotoxin,[5] decreases growth and reproduction in animals and plants,[6] yet the U.S. has not paid close attention to exposure over the years. In 1923 the country introduced leaded gasoline,[7] triggering near unfathomable repercussions for the global community. Research[8] in The Lancet Public Health journal found lead levels in adults are strongly correlated with a higher risk of death from cardiovascular complications and all-cause mortality.

A 2022 estimate found roughly half the U.S. population has been exposed to adverse lead levels in early childhood, raising their risk of adverse health effects and IQ loss.[9]

Although the consequences of lead poisoning may represent one of the biggest health risks in human history, manufacturers removed it only after years of fighting and litigation. They insisted the product was completely safe despite hundreds of research documents to the contrary.

There are several individuals who society must thank for a significant drop in lead levels, but while several battles have been won, the war continues as demonstrated by a July 2023 investigative report in The Wall Street Journal.[10]

Lead-Based Telecom Cables Contaminating Soil and Water

As the Journal reports, AT&T, Verizon and other telecom companies have ignored a network of lead-covered cables across the U.S. that are poisoning the surrounding soil and water. The investigation by the Journal found more than 2,000 lead-covered cables that were a part of the old Bell Telephone System.

More than four dozen locations were found to exceed safety recommendations set by the EPA. For example, in June 2022, a fishing spot in New Iberia, Louisiana, had lead measuring 14.5 times the EPA threshold for areas where children play.

Water samples tested from Lake Tahoe revealed elevated lead levels in several locations, including in Emerald Bay where lead cables were severed, and levels were measured at 5,510 parts per billion and 38,000 parts per billion. In Wappingers Falls, New York, which is 60 miles north of New York City, soil lead measurements were 1,000 parts per million.

The area is near a jungle gym, swing set and basketball court. While no exposure is safe, the EPA believes soil levels in areas where children play should be no higher than 400 parts per million.

On the banks of the Mississippi, lead in the sediment was 19.8 times higher than EPA guidelines and at a levee in Donaldsonville, Louisiana where families often walk together, readings were 2,850 and 2,880 parts per million, which is seven times the guideline for play areas.

In Coal Center, Pennsylvania, a lead-lined cable runs along the street roughly 1 mile long near a school bus stop and playground. In some areas, it droops so low that it's nearly within arm's reach. The WSJ also said that:[11]

> *— Roughly 330 of the total number of underwater cable locations identified by the Journal are in a "source water protection area," designated by federal regulators as contributing to the drinking-water supply, according to an EPA review performed for the Journal.*
>
> *— Aerial lead cabling runs alongside more than 100 schools with about 48,000 students in total. More than 1,000 schools and child-care centers sit within half a mile of an underwater lead cable, according to a Journal analysis using data from research firm MCH Strategic Data.*

— In New Jersey alone, more than 350 bus stops are next to or beneath aerial lead-covered cables, a Journal analysis of NJ Transit data found.

— Roughly 80% of sediment samples taken next to underwater cables, which the Journal tested, showed elevated levels of lead. It isn't known if the level of leaching is constant; experts say old cables tend to degrade over time.

Who Is Responsible for the Cables?

Linda Birnbaum, former EPA official and director of the National Institute of Environmental Health Sciences, told the Journal that these buried lead cables pose a significant problem … "and it's going to be everywhere and you're not even going to know where it is in a lot of places."[12]

Bell Telephone Systems originally installed these cables, but the cable companies holding them now told the Journal "… they don't believe cables in their ownership are a public health hazard or a major contributor to environmental lead, considering the existence of other sources of lead closer to people's homes. They said they follow regulatory safety guidelines for workers dealing with lead."[13]

Responses[14] to the Journal's report came from USTelecom, an industry representative, AT&T and Verizon. USTelecom said it "stands ready to engage constructively on this issue," while AT&T said the report "conflicts not only with what independent experts and longstanding science have stated about the safety of lead-clad telecom cables but also our own testing."

Verizon justified the cables as they "are still used in providing critical voice and data services, including access to 911 and other alarms, to customers nationwide." Other executives told the Journal that leaving them in place would be safer than removal.

But, ultimately, Braden Allenby, former top AT&T environmental health and safety official and now a professor at Arizona State University, revealed a more likely objection to eliminating the lead cables, saying the potential cost and environmental impact were "daunting."[15]

"It was standard operating procedure to abandon those cables in place," he said. "We kept the discussion internal and informal. We didn't try to quantify the problem or speak to the economics overall."

Difficulties in Linking Health Problems to Exposure

In 2021, an environmental group sued AT&T over two cables in Lake Tahoe that are more than 6 miles long. AT&T agreed to spend $1.5 million to remove the cables, even though they no longer use or own them. That cleanup is yet to begin.[16]

The Journal reports that in many instances the companies deny ownership, which adds to the challenge of linking health problems to the cables.[17] For example, in the Idaho Panhandle, there are two abandoned cables in a lake used by children and a prime fishing spot. Water samples show high lead levels and isotopic analysis determined the lead came from the cables and not a nearby slag heap from an old lead smelter plant.

Records show that Verizon, Ziply Fiber and Frontier Communications have served the region over the years, yet they all deny ownership of the cables. Without establishing ownership, it makes it nearly impossible to hold any telecommunication company responsible for cleanup or damage.

The Journal[18] found that the companies knew about the potential risk of exposure to their workers, but "haven't meaningfully acted on potential health risks to the surrounding communities or made efforts to monitor the cables." Denial of the risks is rampant, which also makes it difficult.

For example, when AT&T tested water samples in Lake Tahoe near the severed cables at Emerald Bay, they told the Journal[19] their tests found very low levels of lead and the samples were "largely non-detect for lead," including those "collected nearest the subject cables." However, the Journal's testing at Lake Tahoe near the severed cables and toward the beach actually ranged from nearly five to eight times the EPA limit.

In another instance, Brittany Armas and her three children had been swimming near the cables for years and that she now suffers from fertility and gastrointestinal problems,

but she can't connect her health issues with lead exposure from Lake Tahoe because "it is unknown when the Tahoe cable began to leach," the Journal said.

Health Risks From Lead Exposure Is Multigenerational

Unfortunately, lead can still be found in cosmetics,[20] batteries,[21] pottery and some roofing material.[22] As discussed above, lead is a significant risk factor for heart disease and all-cause mortality.

Besides heart disease, lead exposure has also been linked to a higher risk of reproductive issues in men and women, low birth weight, premature birth, miscarriage,[23] high blood pressure[24] and neurological challenges such as headaches, seizures, brain damage and possibly Parkinson's and Alzheimer's.[25]

Symptoms don't usually appear until years after exposure. Further research has demonstrated that lead:[26]

- Impairs nitric oxide signaling
- Alters renin-angiotensin system
- Promotes inflammation
- Disturbs vascular smooth muscle calcium signaling
- Raises superoxide and hydrogen peroxide in endothelial and vascular smooth muscle cells[27]

According to the 2018 Lancet Public Health article,[28] 18% of all deaths and 28.7% of all cardiovascular deaths are related to lead toxicity. It should therefore make sense that doctors would check patients' lead levels. Yet that rarely happens.

This means that a physician's failure to address lead poisoning not only risks the immediate patient's life but also that of their children and grandchildren. Doug Ruden, co-author of the study and director of epigenomics at told The Allegheny Front:[29]

"If the mothers had high blood lead levels when they were born, then their grandchildren have changes in their DNA. And the changes in the DNA we were looking at weren't permanent changes. They're what we call epigenetic mutations.

The way you think about it is — if a mother is pregnant with a baby, she's also carrying the baby's children too. Because it's like a Russian doll. All of the eggs that a person has in life are actually developed in the fetus, during the fetal period, and all the sperm progenitor cells in the boy babies, the boy fetuses, are also present in the fetus."

Strategies to Avoid Lead and to Get the Lead Out

Common sources of lead exposure include drinking water, cigarette smoke and cheaply made household objects and children's toys. For example, roughly 87,000 Disney-themed clothing items were recalled in late November 2022 because of high levels of lead in the textile ink.[30,31] To protect yourself and your family, consider the following strategies:

- **Lead paint —** If your home was built before 1978, get it inspected and have the paint removed by a certified professional as the dust is highly toxic. For more information on this, see the U.S. Environmental Protection Agency's "Lead-Based Paint Resources" page.[32]
- **Test the water —** Millions of older water service lines across the U.S. are made from lead and could be carrying contaminated water into your home daily. Your safest and most economical choice to get lead out of your water supply is to use a high-quality filter rated for lead removal. Use filtered cold water for drinking or cooking. Never cook or mix infant formula using unfiltered hot water from the tap.
- **Consider household objects —** For information about lead-containing products and recalls, see the Consumer Products Safety Commission's website.[33]

- **Test yourself and your children —** Ideally, all children should be tested at ages 1 and 2, and again at ages 3 and 4 if you live in an older home. It's also recommended to test your child's level whenever there's concern about exposure. Also get yourself tested for lead, especially if your doctor suspects you have heart disease. A level of 3.5 mcg/dL or higher is considered dangerous.[34]

Eliminating lead from your body can be a long and arduous process that must be done carefully to avoid creating more harm in the process. While chelation therapy using edetate disodium (EDTA) may lower the risk of cardiovascular events, it has its own risks. A far safer and more readily available alternative is N-acetyl cysteine (NAC), which is a precursor to glutathione and that your body uses for efficient detoxification.

A 2008 study[35] found NAC protected against lead-induced genotoxicity in human liver cancer cells. Studies have also shown that glutathione can help detoxify the body of heavy metals, like lead.[36,37] Although you can supplement with glutathione, it has poor bioavailability, so NAC is a better option.

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