The Need to Act Now on Mercury Testing

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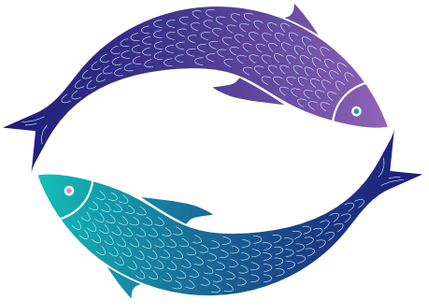
Long-standing public health threats, such as *salmonella* and lead, as well as emerging concerns, like per- and polyfluoroalkyl substances (PFAS) and COVID-19, rightfully receive much attention. Public health laboratories play a leading role in the ongoing, successful responses to these threats. While limited resources restrict a laboratory's ability to address every threat, mercury is a global health crisis that merits attention not only due to its toxicity and prevalence, but also because of environmental concerns affecting communities disproportionately. Mercury exposure can lead to neurological, endocrine, renal and other serious disorders, with these effects more pronounced in children and developing babies. Importantly, reductions in mercury exposures may be achieved faster with fewer resources than other chemicals (e.g., lead and PFAS) by using exposure reduction strategies, such as product and fish advisories.

Mercury is a toxic metal that people may encounter in four main forms: methylmercury, ethylmercury, inorganic mercury and elemental mercury. Methylmercury is the most toxic form and is associated with fish/seafood consumption. Ethylmercury is found primarily in preservatives. Inorganic mercury is commonly found in skin lightening products (SLPs) and ayurvedic medicine. And elemental mercury is present in dental amalgam, compact fluorescent lightbulbs (CFLs), and other consumer goods. While many industrial applications have been phased out, there is continued exposure potential from residual, imported and unanticipated sources. All mercury is toxic and bioaccumulates in humans with a one- to two-month half-life in blood.



Lead	Mercury
CDC Reference Value - 3.5 µg/dL • Routinely evaluated	**No Reference Value** • Limits vary by state—not health-based
Screening Policies and Guidelines • Universal childhood lead screening recommeded • States have individual rules—mandatory tagging	**No Screening Policies or Guidelines** • No universal screening recommendations • States have limited reporting requirements
Medical Treatment Protocols • CDC guidelines based on exposure level • Well-established, consistently applied	**No Medical Treatment Protocols** • No immediate treatment protocols • No long-term monitoring protocols
Tracking and Response • State child and adult lead programs • Federal and state funding for tracking • HUD and other funding available for clean up	**Limited Tracking and Response** • Limited or no state tracking programs • Limited or no funding for tracking • Limited or no funding available for clean up
Products Limits and Bans • FDA limit for baby food • National bans on lead in products	**Limited Product Testing and Bans** • No limits for food—guidance for fish • Limited bans on products—varies by state; limit too high

Figure 1.

Building a Public Health Response Infrastructure…

Some public health laboratories are already addressing the mercury crisis. Health departments in California, Minnesota and New York City use laboratory data to eliminate mercury-added SLPs from the market. Laboratory data identify communities at higher risk of exposure, including populations that are foreign-born, minority or receiving public assistance. Such data can inform public health action. New Jersey Biomonitoring data revealed that mercury exposure is highly prevalent with more than 10% of the state's population being above New Jersey's 5 µg/L health limit and approximately 60% of pregnancies tested in the state having mercury at levels potentially causing health risks.

A comprehensive mercury public health response entails: 1) reducing consumer demand through public education; 2) reducing supply through product restrictions and enforcement; and 3) laboratory testing to identify exposed individuals and contaminated products. Public health laboratories cannot ban products but can generate the human biomonitoring and consumer product data necessary to inform policy decisions. Such data led to the dental amalgam ban in the European Union, which went into effect January 1, 2025.

…And Seeing the Effects

The United States has reduced lead exposure by 93% over the last six decades.

That effort provides an exemplary framework for a public health mercury response. As shown in Figure 1, policies and protocols in place for lead are lacking for mercury. Most public health laboratories currently lack the funding and response infrastructure to collect and test samples, provide environmental interventions or conduct enforcement around mercury. For example, SLPs can contaminate entire homes, from furniture to washing machines and require a complex, coordinated effort to mitigate. Further, medical knowledge and protocols are lacking for treatment of and follow-up care for mercury exposed individuals.

Behavioral change efforts can reduce personal mercury exposure, as seen in New Jersey where varying fish size consumption led to more than 90% reductions in individual exposure levels.

Encouragingly, there are short- and long-term steps that can immediately reduce mercury exposure levels. Level 1 and 2 Laboratory Response Network for Chemical Threats (LRN-C) public health laboratories can conduct mercury testing and initiate small-scale biomonitoring studies. Individuals can switch from eating large to small fish, from using CFL to LED lightbulbs, and from dental amalgam to resin. Such individual actions entail minor cost differences and lower risk and mercury levels within months. Note: SLPs present a challenge as they are targeted at minorities and there are documented societal and occupational costs associated with cessation. Public health laboratories can leverage existing programs (e.g., LRN-C, childhood lead, communications, product enforcement) to address mercury exposures and sources. Public health laboratories and health departments can assume a role in improving health outcomes in populations exposed to mercury. ■