Reducing risks from a persistent poison

"Mercury is everywhere. The more waters we monitor, the more we find mercury." That's what the head of the Environmental Protection Agency, Michael O. Leavitt, said when he reported that Americans were warned last year not to eat fish from more than a third of our country's lakes and nearly a fourth of its rivers.

All told, officials issued 3,094 advisories—the most ever—for 102,000 lakes and 846,000 miles of rivers in 48 states.

A powerful toxicant, mercury can cause neurological damage in children and fetuses and it may be tied to serious health problems in adults. Eight percent of U.S. women of childbearing age have mercury concentrations in their blood that exceed the EPA's safe limit, which puts them and their children at risk.

Most mercury enters our air—and through it, our soil and water—as industrial emissions. Coal-fired power plants account for nearly 70 percent of emissions east of the Mississippi. Natural processes like volcanic activity also produce mercury.

Once it's in our environment, mercury stays there a long time. In the air, it poses little immediate risk. But in water, biological processes can convert it, under certain conditions, into methylmercury. This highly toxic form enters living tissue and accumulates in the food chain, especially in large fish like tuna and swordfish.

People are exposed to mercury primarily by eating contaminated fish. Many people rely on local fish for cheap protein and can't afford safer alternatives.

There's no simple way to reduce mercury contamination, but many scientists believe curbing emissions would be a first step.

The EPA estimates only half of all mercury deposited in our country comes from American sources, so an international approach—perhaps an emissions treaty—may be necessary.

Here at home, the EPA is under court order to announce emissions limits for coal-fired power plants next March, but there's debate about the stringency of the limits, when they should kick in, and whether plants should be given trading allowances to make compliance more cost-effective.

The debate is fueled by gaps in our understanding of how mercury travels and is transformed in the environment. These gaps make it difficult for policymakers to weigh the benefits of reducing emissions against the costs.

Experts at the Nicholas School of the Environment and Earth Sciences are working to close these gaps. We're studying mercury transport in the air and water and are using emission models to directly compare the impacts of the policy options under consideration.

We're also investigating technologies that take advantage of new fields like genomics to clarify—and, one day perhaps, help reduce—the risks posed by mercury already in the environment.

Mercury is a potent, persistent poison. Reducing emissions is the first step in reducing the risks this volatile toxicant poses to our children and to future generations.

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