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The World's Top 10 Worst Pollution Problems

From the residue of mining to untreated sewage, the world is grappling with a host of environmental problems

By David Biello

The "I Trust My Legs" gold mine in Ghana is a local affair, where miners shift silt from rudimentary pits and then combine it with mercury. The element (a toxic metal that can cause brain damage) captures all the gold in the dirt and then, when the mixture is heated, dissipates into the air, leaving just gold bits behind. Unfortunately, in what is known as artisanal mining, the mercury also enters the lungs of miners, their families and others nearby. The United Nations Industrial Development Organization (UNIDO) estimates that some 15 million miners, their families and neighbors (including 4.5 million women and 600,000 children) are affected by the fumes, which are known to cause brain damage and even death.

Such gold mining is just one of world's most pressing global pollution problems, according to the Blacksmith Institute, an environmental health group based in New York City. Among the others: air pollution in homes from cooking, industrial smog in cities, untreated sewage, metal smelting and the recycling of lead (which causes brain damage) from old batteries.

"We reviewed the broad stretch of different kinds of pollution problems that show up around the world and evaluated them according to their gross health risk," says Blacksmith founder Richard Fuller. "We have exported our industry overseas and there are no pollution controls in these places or they are terribly inadequate. So you end up with toxic hot spots."

The institute and its panel of 19 experts analyzed more than 600 such toxic hot spots and the problems they pose; they then evaluated these issues on the toxicity of the pollutant in question, its effect on humans, and the overall number of people impacted.

The top 10, in alphabetical order, are: artisanal gold mining; contaminated surface water; contaminated groundwater; indoor air pollution; metals smelting and processing; industrial mining; radioactive waste and uranium mining; untreated sewage; urban air quality; and used lead–acid battery recycling.

Slide Show: Living with World's Worst Pollution

It is not just the workers in each of these areas who face the biggest threat, but rather the women of child-bearing age and their children, Fuller says. "Children are not just mini-adults. They are, in fact, growing and are much more susceptible to environmental pollutants than adults."

He notes that the lead released during the course of lead–acid battery recycling ups the levels in children's blood to 50 to 100 micrograms per deciliter, or as much as 10 times higher than levels deemed safe by the World Health Organization. Each 10 microgram per deciliter rise in lead levels lowers intelligence levels by four to seven points on IQ tests, according to the U.S. Centers for Disease Control and Prevention (CDC).

Many of these problems, including untreated sewage and urban air pollution, have either been solved or diminished in the developed world, and there's no reason they couldn't also be solved in the developing world, Fuller says. "It's a doable, solvable problem."

The institute is currently putting together a global inventory of polluted places with funding from the European Commission and UNIDO in an attempt to get a handle on the extent of the problem.

And the problems created by the pollutants are not confined to the areas immediately surrounding these types of pollution. Mercury vapor, for instance, once burned off by the artisanal miners can drift high into the atmosphere where it crosses continents and even oceans before settling back to the ground. Once in the food chain it bio-accumulates (increases in concentration as it passes up the chain from plant to plant-eater to meat-eater) until it reaches top concentrations in predators such as tuna fish.

"Many of the toxins we find in our evaluation are transboundary and actually move from the point of emission over to our own ecosystem and food chain," Fuller notes. "So mercury from artisanal gold mining can end up in tuna to poison our own children."