



## TOXICOLOGY

## A Sluggish Response to Humanity's Biggest Mass Poisoning

Arsenic-laced water has sickened thousands in South Asia. After delays and false starts, India is addressing the problem with a \$500 million safe-water initiative

**CHANDALATHI, INDIA**—Until the mid-1990s, the biggest foe of Gouchan and Renubala Ari and their extended family was poverty. Then a more insidious menace began to stalk the Ari home in Chandalathi, a cluster of mud huts on the edge of a yellow mustard field some 60 kilometers north of Kolkata. The first signs of trouble were brown spots on their hands and feet that, as the months passed, developed into thick calluses and lesions. It was several years later that doctors visiting the area recognized the hallmark symptoms of arsenic poisoning.

Tests confirmed that water from the well the Aris were using was laden with arsenic. Their oldest son and his wife were diagnosed with skin cancer, a disease linked with chronic low-level arsenic exposure. Gouchan sold his cow, goats, and ducks to pay for their treatment. The couple died anyway. Afraid of suffering the same fate, two younger sons moved to other parts of India. “Arsenic destroyed our home,” says Gouchan, a frail 76-year-old who walks with a limp because of arsenic lesions. “I’m tired of showing my calluses to strangers,” adds Renubala. “Who can understand our misery?”

Thousands of families in the state of West Bengal have been affected by this blight. More than 40 million people here live in areas with elevated levels of naturally occurring arsenic in the groundwater. Authorities estimate that 5 million in West Bengal drink water with arsenic concentrations above the government standard of 50 micrograms per liter. In neighboring Bangladesh, more than 82 million people live in contaminated areas. And the problem is widening: In recent years, researchers have found high levels of groundwater arsenic in several other Indian states, including Uttar Pradesh, Bihar, and Manipur.

Although there are no reliable statistics on arsenic victims in India and Bangladesh, one research group has counted at least 14,000 cases of arsenicosis in West Bengal alone. The

**Home wrecker.** Gouchan and Renubala Ari lost their son and daughter-in-law to skin cancer attributed to drinking arsenic-contaminated water.

arsenic scourge, says Allan Smith, an epidemiologist at the University of California, Berkeley, is the “largest poisoning of a population in history.”

It didn’t have to turn out this way—certainly not in India, whose government frequently touts the country’s burgeoning science and technology capacity. Here in West Bengal, officials have had a quarter-century to tackle the contamination. (Bangladesh learned of the threat a decade later.) Yet the government failed to investigate it adequately or provide alternative water resources to affected areas, critics charge. “For many years, government officials accused us of lying and exaggerating the problem,” says dermatologist Kshitish Saha, who uncovered the first cases of arsenicosis while at the School of Tropical Medicine in Kolkata.

Since the early 1990s, when Indian authorities began to respond more vigorously to the crisis, state and national governments have pumped tens of millions of dollars into solutions aimed at providing safe water. The results have been lackluster. A \$7 million initiative to fit wells with arsenic filtration units failed because of improper maintenance. Another strategy—drilling deep wells that bypass arsenic-tainted aquifers—has produced mixed results.

The most deplorable aspect of the tragedy, critics say, is that Indian officials have resisted educating villagers about the threat, partly out of concern that this could lead to societal unrest. This is unconscionable, says Dipankar Chakraborti, an environmental scientist at Jadavpur University (JU) in Kolkata. “If people are made to realize the dangers of drinking arsenic-contaminated water, they will take care of their own safety,” he says.

West Bengal officials acknowledge that the state erred. But they say that a half-billion-dollar initiative now under way to install eight surface-water treatment plants and 360 high-capacity, deep wells fitted with arsenic-removal facilities will provide a long-term remedy to what ranks as one of the biggest public health disasters of the modern world. “Yes, there have been



**Mark of a killer.** Renubala’s palms bear the brown calluses that are a hallmark symptom of arsenicosis.