

A Silent Killer in India's Villages

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Health

Arsenic kills by stealth in India's villages

Public health interventions have been few and far between to check the continuing ravages of arsenic poisoning in India



About 9.6 million people in the state of West Bengal, 1.6 million in Assam, 1.2 million in Bihar, 500,000 in Uttar Pradesh and 13,000 in Jharkhand are at "immediate risk" from arsenic contamination of groundwater.



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Published on:

15 Oct 2024, 11:45 am

When warts, lesions and sores began to appear on Manatosh Biswas' skin back in 2011, he consulted a doctor who advised him to undergo a few tests.

Biswas, a resident of Madhusudankati village in West Bengal's densely-populated North 24 Parganas district adjoining Kolkata, did as the local physician advised.

The test results confirmed that he was suffering from arsenicosis, a condition that manifests in humans exposed to the notoriously toxic heavy metal arsenic.

For 15 years, Biswas lived with Bowen's disease, a precancerous condition that is a consequence of consuming groundwater with a heavy presence of arsenic.

Since 1983, when arsenic contamination of groundwater sources was officially confirmed in West Bengal, the situation has remained unaddressed with reports suggesting that the problem may have actually worsened.

This is a result of inadequate coordination between the central and state governments which paid little attention to fix the crisis.

Millions at risk

Central government information released in 2016 suggested that 9.6 million people in the state of West Bengal, 1.6 million in Assam, 1.2 million in Bihar, 500,000 in Uttar Pradesh and 13,000 in Jharkhand — a massive swathe of territory in India's Ganga Basin — were at "immediate risk" from arsenic contamination of groundwater.

More recently, an extensive study found that groundwater in about 20 per cent of India's total land mass contains "toxic levels of arsenic", exposing more than 250 million people across the country to this deadly element.

Arsenic contamination of groundwater has affected the health of millions of people globally with populations in Bangladesh, India and China the worst affected.

Other countries with arsenic contaminating their groundwater supplies include Argentina, Cambodia, Chile, Hungary, United States, Mexico, Romania, Pakistan, Nepal and Vietnam. Asian and Southeast Asian countries are by far the most impacted.

The World Health Organization classifies arsenic as carcinogenic to humans and lists various forms of cancer, skin lesions, cardiovascular ailments and diabetes as diseases caused by long-term exposure to the deadly element.

Effects of arsenic poisoning

Chronic exposure to arsenic leading to cancer depends on factors like how long someone is exposed, how much they are exposed to, their genetic makeup as well as their nutrient requirements.

Ongoing research has focused on the impact of groundwater arsenic toxicity on prenatal health and the consequences of such acute exposure on children's development.

Research with respect to expectant mothers' exposure to arsenic found miscarriages, low birth weight, babies dying before their first birthday, congenital anomalies and stillbirths were more common.

Soon after the prevalence of arsenic in West Bengal's groundwater was confirmed in the early 1980s, public health officials in Bangladesh detected the toxic metal in their groundwater as well.

More than half the groundwater samples tested in certain areas of West Bengal and Bangladesh found five to ten times more arsenic than the permissible safe limit, making it unsuitable for household and irrigation purposes.

Bangladesh affected

Bangladesh's arsenic-contaminated well water is a national public health issue with an estimated 40 million, or approximately one-quarter of the population, exposed to this threat.

Shallow water wells are cheaper to install but more vulnerable to arsenic poisoning, which exposes millions of people who cannot afford to install safer but more expensive deep wells to this toxic metalloid.

Groundwater drafting — where the rate of groundwater withdrawal far exceeds the rate of recharge — is a major reason for arsenic poisoning.

In such cases, the aquifer chemistry changes and arsenic toxicity is even more persistent at shallower depths of the aquifers. Unfortunately, in most South Asian countries, laws on groundwater drafting go unimplemented even when they exist.

The combined Ganga-Brahmaputra-Meghna basin of the Indian subcontinent is severely impacted by groundwater arsenic contamination.

The Bengal basin, home to more than 250 million people, has a long history of arsenic poisoning of groundwater supplies and the attendant health consequences that have brought for more than three decades now.

In India, West Bengal, Bihar and Assam host about 92 per cent of the population affected by arsenic groundwater contamination.

In West Bengal alone, more than six million people in 2,700 villages across nine districts are exposed to unsafe levels of arsenic.

A silent killer

What is worse is that in most cases these people are unaware of this poison which kills them over time.

Their lower socio-economic status prevents them from actively finding solutions to the problem and they remain dependent on government interventions which have largely failed to materialise due to various socio-economic concerns.

The worst affected districts in West Bengal include Malda, Murshidabad, Nadia and North 24 Parganas.

Nearly 50 per cent of Bihar's districts have arsenic concentrations in the groundwater which far exceed the safe limit.

People in the affected districts of West Bengal and Bihar use shallow hand pumps, installed over water sources with more than 1,000 times the permissible limit of arsenic.

Alarmingly, children as young as six or seven from Bihar's villages have been treated at Patna's Mahavir Cancer Institute with cancers associated with arsenic exposure. More than 1 million people have died as a result of exposure to this toxin in Bihar.

Exposure to toxic levels of arsenic can be reduced by providing safe water for drinking, food preparation and irrigation.

The food chain is specifically sensitive as there could be various sources of arsenic biomagnification through groundwater use. For example, through this process food crops irrigated with arsenic-contaminated groundwater may have higher levels of arsenic than the source groundwater.

Various state governments have taken different routes to tackle arsenic groundwater contamination.

In Bihar, a task force was set up to create awareness about the perils of arsenic in groundwater. A project aimed at ensuring tap water for every household in the state was launched in 2021.

The same year, the West Bengal government set up an extensive database using mapping programmes to identify areas of arsenic toxicity and also launched extensive awareness missions to educate villagers about the dangers of arsenic poisoning.

A colour-coded identification scheme to categorise groundwater wells as safe or unsafe for domestic and irrigational use was also launched. Several filtration pumps have also been installed in contaminated wells to improve the water quality.

Arsenic poisoning cannot be prevented at the individual level, it needs national and global interventions.

Lack of coordinated action between governments, charitable institutions, foreign aid agencies and consulting firms is not helping solve the issue. Rather communities would benefit from greater accountability and a will to implement effective solutions.

The problems of groundwater arsenic contamination are far-reaching and need to be seriously monitored at regular intervals to minimise their devastating effects. This can only be done through adequate awareness and interventions.

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