

# Death in a glass of water

## Scientists believe up to 30 million people in Bangladesh could be drinking water contaminated with lethal doses of arsenic. Who is to blame?

By Fred Pearce

19 January 2001

British researchers are among those accused of failing to spot concentrations of arsenic in what UN scientists believe is "the largest mass poisoning of a population in history". Geologists analysing water in newly-sunk wells in Bangladesh nine years ago for the British government failed to spot high concentrations of arsenic, now thought to be poisoning millions of Bangladeshis. The study was designed "to assess the... possible toxicity of groundwater to humans". But according to a British geologist who has analysed the Bangladesh tragedy, John McArthur, professor of geochemistry at University College London, the researchers did not rigorously follow World Health Organisation's guidelines and check for the metal.

The arsenic is thought to be present at dangerous levels in between two and five million of the 10 million wells sunk across Bangladesh over the past 25 years - many of them by international aid agencies, including the official aid arm of the British Government. Some wells pump up water that exceeds the safety limits a hundredfold or more.

In some villages today, the majority of the population suffers from the early symptoms of poisoning, such as ulcerous growths on their skin. The final stages bring gangrene and cancers. With the majority of the country's 68,000 villages potentially at risk, UN scientists estimate that the arsenic may soon be killing 20,000 Bangladeshis a year.

Among those whom it is claimed failed to spot the arsenic were scientists working for the British Geological Survey on a water-quality survey of central and northeastern Bangladesh, funded by the British Government's Overseas Development Administration, which has since been renamed the Department For International Development. They surveyed water from 150 tubewells - mechanically drilled boreholes - at different depths. They included samples from areas where more than three-quarters of wells used for drinking are now known to contain concentrations of arsenic that are lethal if drunk regularly, says Professor McArthur. But arsenic was not among the 22 parameters tested.

"They did not find arsenic because they did not look for it, even though there were routine, well-established techniques for doing so," says Professor McArthur. "They should have analysed for all the trace elements in the WHO guidelines - and that included arsenic."

Denis Peach, head of groundwater at the BGS, told *The Independent* this week: "It is true that arsenic was one of the many parameters in the WHO guidelines. But it was and

remains common practice not to measure all the [WHO] determinands on the list for reasons of cost and/or availability of facilities."

He says at the time of the survey, arsenic "was not widely thought to be a problem in groundwaters". Certainly, "BGS staff can vouch for the fact that at that time no one there was talking about arsenic... In retrospect we, and others, made a mistake."

Professor McArthur accepts that the BGS had no special reason to suspect arsenic. But he claims "arsenic is often associated with iron in water - and they knew there was iron". Bangladeshis have reason to feel let down, he says. "The BGS are regarded as experts. If they said the water was safe, it would be seen as safe."

The fact that the arsenic remained undetected led to a delay of five years in the uncovering of a public-health disaster worse than Chernobyl or Bhopal. The survey took place eight years after the WHO had set formal international standards for arsenic in water supplies, but occurred in the months before the WHO toughened standards further because of growing concern, particularly in the US.

Studies round the world in the 1990s have shown arsenic to be widely present in underground water. It is now believed to be a major cause of cancer.

Through the early years of the tubewell programme, scientists grew concerned about the lack of proper analysis of water quality by the Bangladeshi government and aid agencies. British engineering consultants Mott MacDonald reported that the available data left "a lot to be desired". Studies by aid agencies were intended to help improve things. But it turns out to have given engineers a false sense of security. With the water given the all-clear, doctors failed to implicate it in unexplained cases of arsenic poisoning seen in increasing numbers since 1987.

Dangerous levels of arsenic are believed to be present in between a quarter and a half of the country's estimated 10 million tube wells. It is naturally present in the delta muds beneath most of the country.

Scientists still dispute why it dissolves into the water in such quantities. Tragically, the arsenic is concentrated at between 20 and 100 metres below the surface - just the depth to which most wells were sunk. Deeper wells would have been safe.

Most of the wells were sunk during the 1980s' UN World Water Decade by agencies such as Unicef, the UN children's agency, which inaugurated the programme and itself sunk 900,000 wells. The aim was to convert Bangladesh from a country reliant on often polluted surface waters to one drinking "safe" underground water. Aid agencies hoped to reduce the death rate from diseases such as cholera and dysentery, and in that they succeeded: the wells have helped halve Bangladesh's infant mortality rate. But the gain appears to have been at the expense of visiting horrific diseases on those same children in adulthood.

Unicef stands by its tubewell programme. "At the time, standard procedures for testing the safety of groundwater did not include tests for arsenic, which had never before been found in the kind of geological formations that exist in Bangladesh," it said.

In a separate development, *The Independent* has established that international efforts launched more than two years ago to staunch the flow of arsenic in Bangladesh's tubewells is close to collapse, with little more than 1 per cent of villages surveyed so far. The two findings add to a growing sense that foreign agencies could have done more to avert the tragedy.

In August 1998, following reports that as many as 30 million people could be drinking lethal water, the World Bank and Bangladesh government announced a three-year crash programme to survey an initial 4,000 villages and draw up action plans to replace the poisoned wells. It was just the beginning of what the Bank promised would be a massive 15-year campaign to eliminate arsenic from millions of wells in the country's 68,000 villages.

But today Bank officials say only 800 villages have been tested, and few action plans have been drawn up. Richard Wilson of Harvard University's department of public health, a leading analyst of the crisis, says "the project is stalled". Wilson says the Bangladeshi government cannot decide how to spend the \$44m on offer and says bank officials have been deeply troubled by the failure.

Bangladeshi officials in turn criticise Western organisations, accusing them of wanting to spend the money on foreign consultants, and of trying to bypass national technical committees. As the bureaucrats bicker, the task they face appears ever more daunting. In recent months, says the Bank's Dhaka water specialist Khawaja Minnatullah, scientists have doubled the estimate of the number of tubewells in the country that will need surveying from 5 to 10 million.

Whatever the precise mechanism involved, one solution would clearly be to sink all tubewells to depths greater than 100 metres. Had that been done in the first place, Bangladeshis would today be drinking safe water.

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