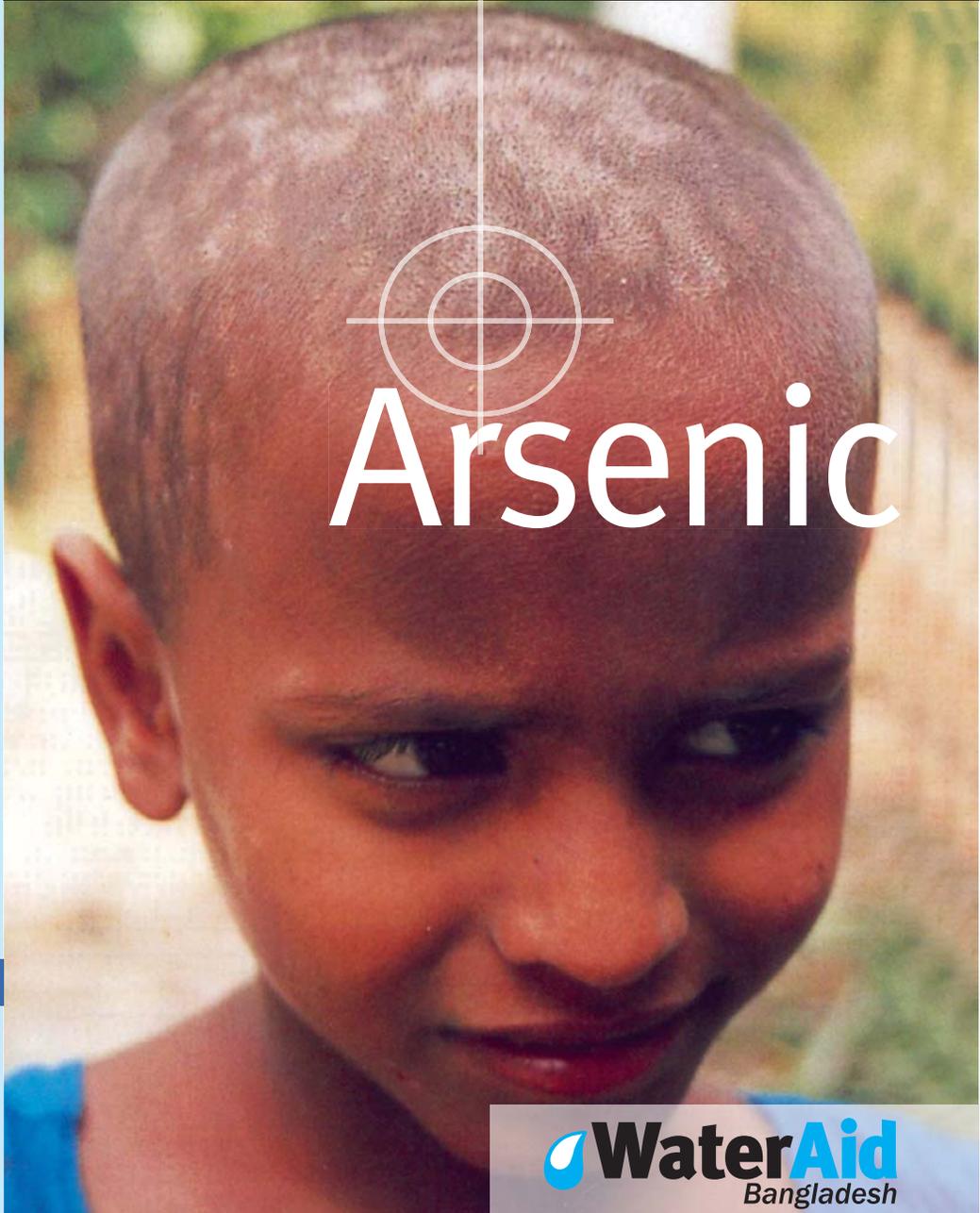


# Silent Killer

- It is wise to take assistance from the Health Workers or communicate with local Health Centre or Doctor in finding out arsenicosis patients.
- As the rainwater is arsenic free, this can be collected through a specified process and preserved for drinking and cooking.
- If there is no safe water provision, pond/river water can be used for drinking and cooking after boiling and cooling.
- Boiling of arsenic contaminated water is NOT recommended as intensity of arsenic increases with boiling.
- Different types of filters like Sono filter, Alcan filter, SIDCO Arsenic Removal plant and Read-F can be used to remove arsenic from water.
- We should behave with arsenicosis patients empathetically and offer all co-operations in terms of socialising, because it is not contagious or hereditary manifestations.



Arsenic

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**WaterAid – Water for life** The international NGO dedicated exclusively to the provision of safe domestic water, sanitation and hygiene education to the world's poorest people.

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The logo for WaterAid Bangladesh, featuring a blue water drop icon to the left of the text 'WaterAid' in a bold, sans-serif font, with 'Bangladesh' in a smaller font below it.

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## Silent Killer: Arsenic

Arsenic is a toxic chemical substance that creates adverse impact on human body. Arsenic cannot be found in nature as a free element. It creates compounds with lead, gold, silver, mercury, and iron. Arsenic is called metalloid because it has the property of both metal and non-metal. It is found both in organic and inorganic form; yellowish, blackish or grey in colour. Arsenic compounds are mainly used in agriculture, forestry and industrial processes, particularly in manufacturing of agricultural chemicals (pesticides), glass and glassware, industrial chemicals like dyes, electronic chips etc. Arsenic is found in atmosphere, in the aquatic environment, in soils and sediments and in organisms. Human body receives some amount of arsenic through air, food-water and absorption by skin.

The environmental degradation as a whole leads to the arsenic contamination in ground water of Bangladesh that becomes the great public health challenge. Arsenic contamination has been found in shallow tubewell. Arsenic contamination in drinking water has raised concerns because of its potential to cause several adverse human health effects. The acceptable limit for arsenic in human body has been fixed 0.05 milligram per litre for Bangladesh. Arsenic contamination has been found in 61 districts out of 64 although the remaining three hill districts - Bandarban, Rangamati and Khagrachari were not tested for arsenic contamination.

## Adversity of Arsenic

The most adverse impact that caused in human body by the arsenic contamination is cancer. Arsenic can cause cancer. It can also create short and long term toxicity in human body. The deadliest level of the toxicity is 125 milligram. The intake of 125 milligram arsenic at a time will result in immediate death to any body. The toxicity of arsenic is four times higher than mercury.

The symptom of toxicity becomes exposed within half an hour of arsenic intake above 70 mg through food or drinks. The immediate symptoms are irritation of digestive tract, leading to pain, nausea, vomiting, diarrhoea, muscle convulsion, less urination, bloody stool etc. At this circumstance, the affected person may die within 12-48 hours.

In the case of long term impact, the symptoms of arsenic toxicity may take six months to 10 years to be manifested in a person's body after the patient starts drinking arsenic contaminated water. This period differs from patient to patient, depending on the quantity/volume of arsenic ingested, immunity level of the individual and the total time -period of arsenic ingestion.

## Symptoms of Arsenicosis

The disease caused by arsenic toxicity is called arsenicosis. Generally arsenicosis is detected through examining one's skin and palm. Drinking arsenic contaminated water for long time may result in black spots in the body, tongue and gum. The spots may be white in colour too. The palms of the hands and foot-soles become hardened and develop gangrenous ulcers. Moreover, general weakness, burning sensation, hot feeling, lung inflammation, chronic coughs, liver cirrhosis, short of hearing etc may be evident in such patients.

Followings are looked in to identify an arsenicosis patient: whether the patient has been drinking arsenic contaminated water for long time; has black and white spot or ulcer on the skin, palm, foot-soles or gum. It might be asymptomatic for individual despite having been drinking arsenic contaminated water for long time. In that case the presence of arsenic can be detected through examining urine, nails and hair. The government has identified 37,749 arsenicosis patients in Bangladesh.

## Management of Arsenicosis

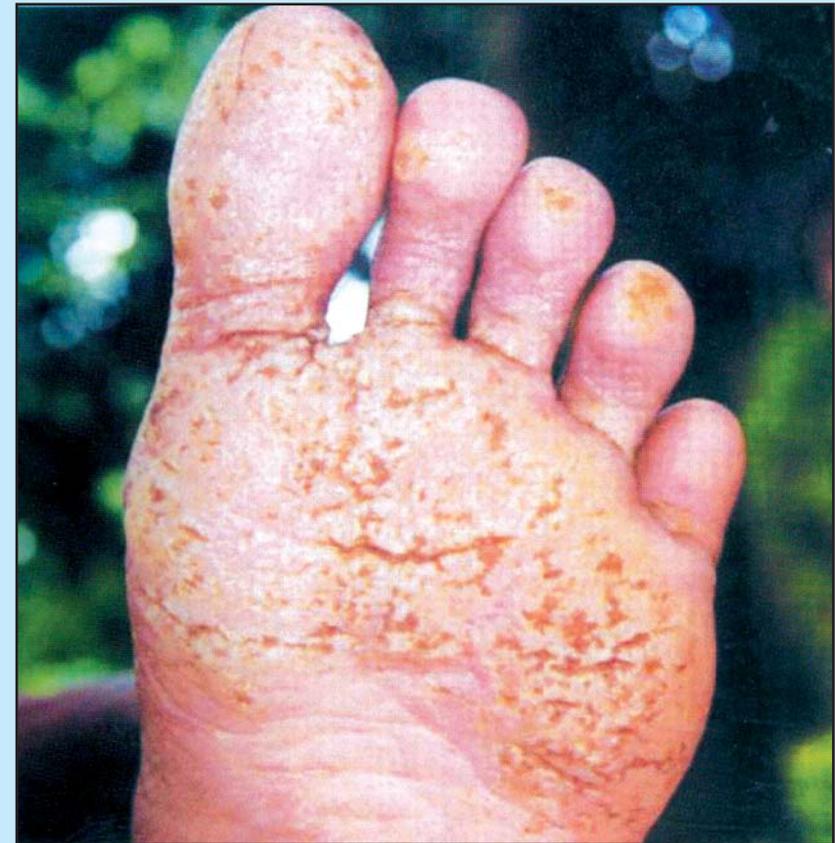
So far no specific medicine is known for the treatment of arsenicosis. If someone is suspected to have arsenicosis, drinking arsenic contaminated water has to be stopped immediately. One has to remember arsenicosis can be cured if detected and treated in early stage. Things improve for most of the patients with the intake of arsenic free water and nutritious food like fresh vegetables, fruits, lentils, eggs and milk.

It is assumed that vitamin A, C and E help to reduce the toxicity of arsenic. Moreover, using ointment with 10-20% salicylic acid on the rough surfaces of palm and foot sole has been found effective. Advanced level of toxicity is difficult cure. It is not contagious or hereditary. We should not avoid such patients and offer all cooperations so that they can live easy life.

## Testing of arsenic in water

A number of development organisations working for safe water supply and sanitation at the field level are being involved in testing arsenic in water through several kit boxes (Hach kit-E Z).

Sub Assistant Engineer at Upazila level and Executive Engineer at District level of the Department of Public Health Engineering are supposed to provide assistance regarding arsenic testing. Arsenic in water can be tested on payment in Effective Water Testing Laboratory (in Comilla, Khulna, Rajshahi, Mymensingh, Tongi and Mohakhali) of the Department of Public Health Engineering. The same services are being provided by the Bangladesh Science Laboratory, Bangladesh University of Engineering and Technology, Khulna University of Engineering and Technology, ICDDR,B, Intonix-Dhaka and NGO Forum for Drinking Water Supply and Sanitation on payment.



## How to Combat Arsenic Contamination

**Use green marked tubewell:** If arsenic is found in water use only the arsenic free tube-well (marked in green) water from the nearby areas for drinking and cooking.

**Arsenic removal filter:** Different types of filters like Sono filter, Alcan filter, SIDCO Arsenic Removal plant and Read-F can be used to remove arsenic from water.

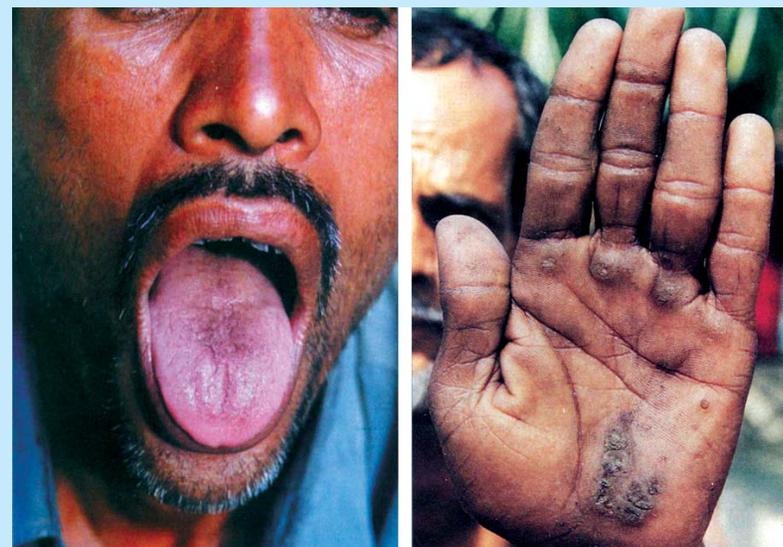
**Rainwater Harvesting System:** Rainwater is arsenic free. This rainwater can be collected through a specified process and preserved for drinking and cooking.

**Pond sand filter (PSF):** Use pond water after treating it through a certain process, when there is no alternative.

**Boiling water:** If there is no safe water provision, pond/river water can be used for drinking and cooking after boiling and cooling.

## Major actors in combating arsenic

- At the national level, the Bangladesh Arsenic Mitigation Water Supply Project (BAMWSP) ended in June 2006 and a new programme titled Bangladesh Water Supply Project began for February 2005 to 2009 to ensure arsenic mitigation and safe water supply. 80% or more tubewells found to be arsenic contaminated in 23 Upazilas.
- The Directorate General of Health Services has been assigned to identify arsenicosis patients.
- The Dhaka Community Hospital (190/1, Baro Moghbazar, Wireless gate, Dhaka-1217) has been engaged with arsenicosis patients' management.
- Bangladesh Environmental Technology Verification- Support to Arsenic Mitigation (BETV-SAM)-OCETA has been engaged in developing for arsenic free water technology in association with DPHE, Unicef and Bangladesh Science Laboratory.



## Our responsibility in arsenic contamination

- The taste, colour and odour remains same when water is arsenic contaminated. That is why, tubewell water should be tested in every six months to know the presence or increase in level of arsenic in water.
- For water testing, please contact local Public Health Engineering Office -- Sub Assistant Engineer at Upazila level and Executive Engineer at District level. You may also contact local Health Worker or Development Worker. Water Testing Laboratories of the Department of Public Health Engineering in Comilla, Khulna, Rajshahi, Mymensingh, Tongi and Mohakhali provide the service on payment. The same services are being provided by the Bangladesh Science Laboratory, Bangladesh University of Engineering and Technology, Khulna University of Engineering and Technology, ICDDR,B, Intonix-Dhaka and NGO Forum for Drinking Water Supply and Sanitation on payment.
- The arsenic contaminated tubewell must be marked in RED colour and arsenic within acceptable limit/arsenic-free tubewell in GREEN colour.
- Water of the green coloured tubewell can be used for any purpose, **including** drinking and cooking.
- Water of the red coloured tubewell can be used for any purpose, **excluding** drinking and cooking.
- One has to stop drinking immediately after finding arsenic in tubewell water and use arsenic free water for drinking and cooking.