

# Fluoride and Arsenic in Drinking Water

In Kachariadih village, India, a group of children with limbs twisted out of shape hobble forward with the help of walking sticks. They grin with embarrassment because they cannot run like other children their age – fluoride poisoning has crippled their limbs.

Millions of children are exposed to excessive amounts of fluoride through drinking water contaminated from natural geological sources. In China, the burning of fluoride-rich coal adds to the problem. Small amounts of fluoride are good for teeth; it is added to toothpaste and, in some countries, to drinking water. At higher doses, it destroys teeth and accumulates in bones, leading to crippling skeletal damage. With their bodies still growing, children are most at risk.

Like fluoride, arsenic is widely distributed throughout the earth's crust, and is present in almost all waters in very small amounts. In certain areas, however, there are dangerous levels of this toxin in children's drinking water. The most tragic example is Bangladesh, where thousands of wells are causing a mass poisoning of the population. Unsafe wells are marked with red paint, warning people that this water is not for drinking.

## Health effects

### Fluorosis

- Tooth discoloration and decay
- Crippling skeletal damage

### Arsenicosis

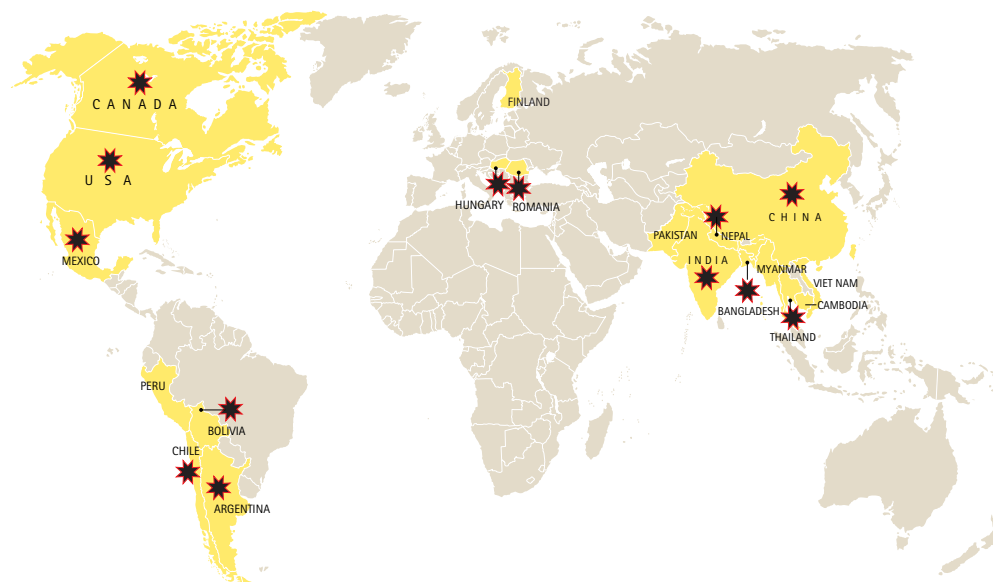
- Skin pigmentation changes and skin thickening (hyperkeratosis)
- Cancer of the skin, lungs, bladder and kidney

"The dose makes the poison."  
Paracelsus, physician  
(1493–1541)

## Arsenicosis

2004 or latest available data

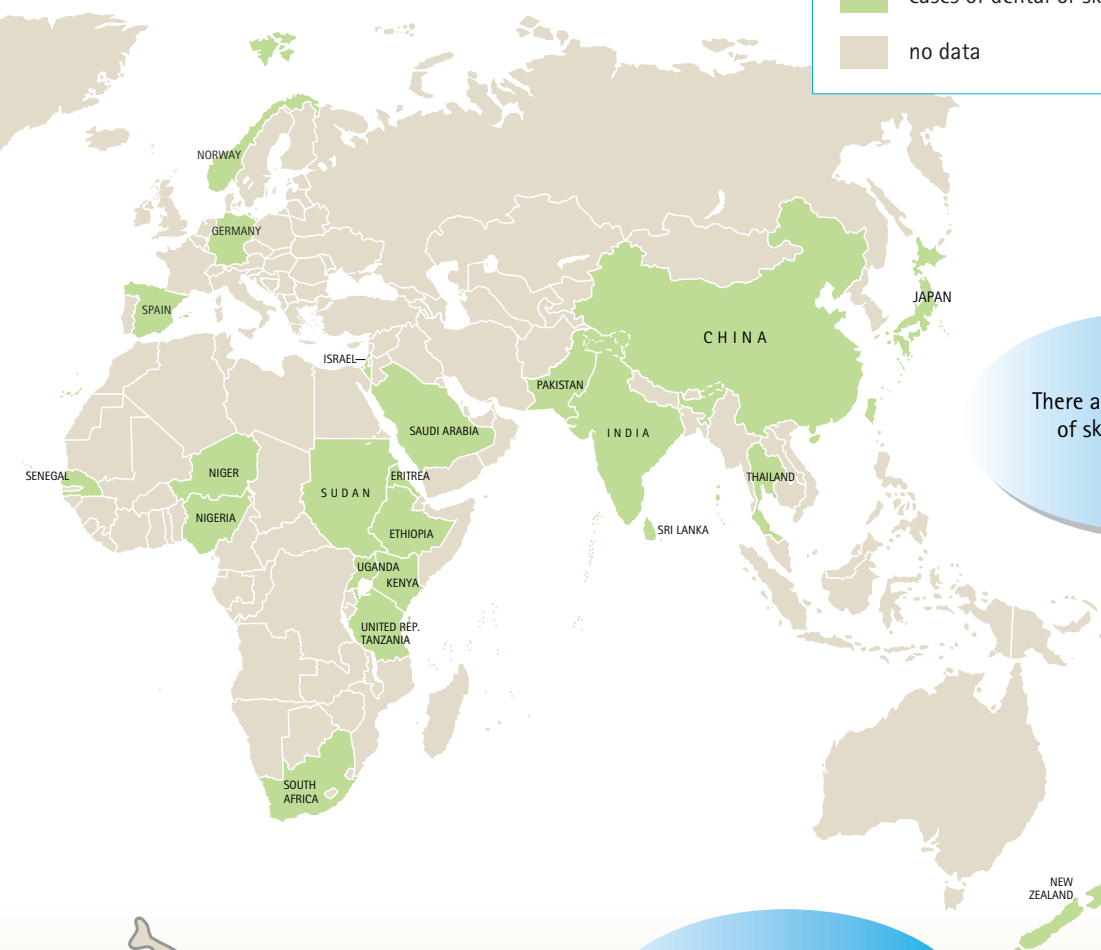
- elevated levels of arsenic (over 50 µg/l) reported in water
- ★ ill-health has been reported due to arsenic-contaminated water



## Fluorosis

2004 or latest available data

- cases of dental or skeletal fluorosis reported
- no data



There are 2 million cases of skeletal fluorosis in China.

Some estimates suggest arsenic in drinking water will cause 200 000 to 270 000 deaths from cancer in Bangladesh alone.

## Arsenic poisoning in Bangladesh

Percentage of boreholes tested where arsenic levels are above 50 micrograms per litre (µg/l) 1999

The WHO provisional guideline value for arsenic in drinking water is set at 10 µg/l

- 75% and over
- 50% – 74%
- 25% – 49%
- under 25%
- no data

