

## Babies exposed to chlorinated water at risk of heart problems

Babies born in areas where drinking water is heavily disinfected with chlorine are at double the risk of heart problems, cleft palate or major brain defects, according to a new study.

By Roger Highfield, Science Editor  
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Expectant mothers can expose themselves to the higher risk by drinking the water, swimming in chlorinated water, taking a bath or shower, or even by standing close to a boiling kettle, say researchers.

The finding, based on an analysis of nearly 400,000 infants, is the first that links by-products of water chlorination - chemicals known as trihalomethanes, or THMs - to three specific birth defects.

Exposure to high levels of THMs substantially increased the risk of holes in the heart, cleft palate and anencephalus, which results in the absence of a major portion of the brain, skull, and scalp.

Where exposure to THMs was above 20 millionths of a gram per litre, there was an increased risk of 50 to 100 per cent of these conditions compared with levels below 5 millionths of a gram per litre.

The dangerous levels are reached in one in six households in the UK - around four million homes - according to the author, Professor Jouni Jaakkola, at the University of Birmingham's Institute of Occupational and Environmental Medicine.

"The biological mechanism for how these disinfection by-products may cause defects are still unknown," says Prof Jaakkola, who reports the findings with Taiwanese colleagues in the journal *Environmental Health*.

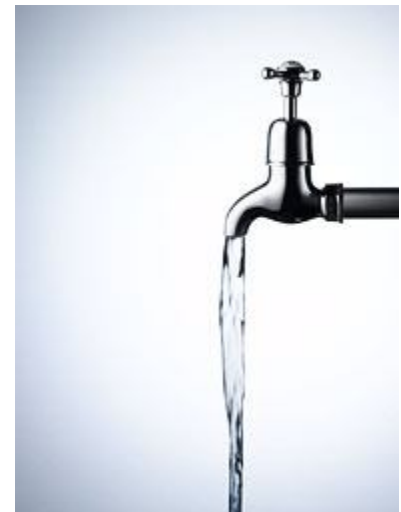
"However, our findings don't just add to the evidence that water chlorination may cause birth defects, but suggest that exposure to chlorination by-products may be responsible for some specific and common defects."

Chlorination has been a major public health success, cutting waterborne diseases, but he says that earlier work may have missed this effect by not using specific categories of birth defect.

"While the benefits of water chlorination are quite evident, more research needs to be carried out to determine these side-effects," he says.

The water industry body, Water UK, also said it would study the findings but says chlorination in the UK meets current World Health Organisation guidelines and drinking water directives.

The Drinking Water Inspectorate said it will study the new findings but said it had recently funded a study with a sample size approximately eight times larger than the Taiwan study and found "little evidence between THM concentrations in drinking water and risk of congenital defects and consequently tap water is safe for expectant



Chlorination has been a major public health success Photo: GETTY

mothers."

The majority of people on the public water supply receive chlorinated water, though not all those who drink the water will be exposed to the byproducts.

Those who generally will not be exposed are the approximately half a million people on private supplies - and some of them may, depending on the nature of their supplies have chlorination.

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