

Toxic arsenic exposure discovered in Cornish private water supplies

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It is widely appreciated that toxic arsenic in well water is a devastating environmental health issue overseas in developing countries such as Bangladesh. However, a PhD student from The University of

Manchester, together with colleagues from the British Geological Survey, has discovered high exposure to the chemical from private water supplies here in the UK.

Following a recent British Geological Survey/Health Protection Agency study in Cornwall which showed that 5% of the private supplies tested had concentrations of toxic arsenic exceeding 10 micrograms per litre - and so exceeding World Health Organisation guidelines - Daniel Middleton, a postgraduate research student, has worked with Professor David Polya (also from The University of Manchester) and Dr Michael Watts (from the British Geological Survey) amongst others to study the exposure of householders with private supplies in 127 homes in the county.

Their research, published in Nature Publishing Group's *Scientific Reports* journal, showed that the small number of people living in homes with high arsenic in their supplies had urine tests which generally revealed high arsenic concentrations, which provides strong evidence that they are being exposed at concentrations potentially detrimental to their health.

After adjustments were made for less toxic or harmless arsenic forms derived from eating seafood, it became apparent that the private [water](#) supplies of these householders was the most substantial route of toxic inorganic arsenic exposure. The researchers suggest that installing suitable water treatment or using alternative supplies for drinking water or drinks could reduce their exposure, and any consequent health risks.

Cornwall was one of the most important mining areas in Europe until the early 20th century, as it has a geology rich in high metal (tin, tungsten) and high arsenic rocks and sediments, which has contributed to the high arsenic concentrations found in these supplies.

"These findings have important implications regarding the water quality

of private supplies used for human consumption, not just in Cornwall, but across the UK and Europe," said lead author Daniel Middleton.

"Owners of single domestic supplies in England are not obliged to test or treat their water - we hope that this study raises awareness about the possible presence of arsenic and other potentially harmful elements in these supplies."

While Cornwall is one of the counties most seriously impacted by high arsenic in private [water supplies](#), groundwater [arsenic](#) hazard also exists in other parts of the UK, and is a chemical that should be routinely tested for by householders who drink water from groundwater-derived private supplies.

More information: D. R. S. Middleton et al. Urinary arsenic profiles reveal exposures to inorganic arsenic from private drinking water supplies in Cornwall, UK, *Scientific Reports* (2016). [DOI: 10.1038/srep25656](#)

Provided by University of Manchester

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