

## **Arsenic in drinking water and bladder cancer: a case-control study in Utah, USA**

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Mortality from bladder cancer and other cancers is elevated among populations exposed to high levels of arsenic ( $170\text{--}800\ \mu\text{g l}^{-1}$ ) in drinking water in Taiwan, Chile, and Argentina. A small case-control study in Utah, conducted in 1978, suggested elevated risk among male smokers exposed to lower levels of arsenic (range =  $0.5\text{--}16\ \mu\text{g l}^{-1}$ , mean =  $5\ \mu\text{g l}^{-1}$ ). To evaluate these associations in a larger study population we used data from a case-control interview study of 312 bladder cancer patients and 625 population-based controls conducted in Utah in 1979–1983. Indices of exposure for each subject were developed by combining information from a state database of arsenic in community drinking water supplies, with individual residential histories and information on fluid ingestion. In preliminary analyses, we found no overall association of bladder cancer risk with estimates of total lifetime arsenic intake. However, in subgroup analyses of cumulative exposure, we found modest elevations in bladder cancer risk among non-smokers and among females. Among non-smokers, odds ratios were 1.7, 2.2, and 1.9, and among females, odds ratios were 1.8, 1.4, and 1.9 for total lifetime arsenic intakes of 60–89, 90–149, and 150+ mg, relative to <60 mg. Analyses of risk by total exposure in decade-long time windows suggested associations with bladder cancer for exposures that occurred 50–59 years prior to diagnosis. These preliminary findings suggest possible elevations in bladder cancer risk many years after exposure to relatively low levels of arsenic in drinking water and among sub-populations with a low baseline risk.

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## **Exposure to arsenic in air and drinking water: results of a case-control study in northern Chile**

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The population of northern Chile has high death rates for some cancers. Arsenic (As) is present in drinking water. There is also air pollution from As as a result of mining activity. Current levels of As in drinking water are below the recommended level of  $50\ \mu\text{g l}^{-1}$  and there is ongoing debate about its causal role. To assess the cancer risk