

Risk of internal cancers from arsenic in drinking water.

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Abstract

The U.S. Environmental Protection Agency is under a congressional mandate to revise its current standard for arsenic in drinking water. We present a risk assessment for cancers of the bladder, liver, and lung from exposure to arsenic in water, based on data from 42 villages in an arseniasis-endemic region of Taiwan. We calculate excess lifetime risk estimates for several variations of the generalized linear model and for the multistage-Weibull model. Risk estimates are sensitive to the model choice, to whether or not a comparison population is used to define the unexposed disease mortality rates, and to whether the comparison population is all of Taiwan or just the southwestern region. Some factors that may affect risk could not be evaluated quantitatively: the ecologic nature of the data, the nutritional status of the study population, and the dietary intake of arsenic. Despite all of these sources of uncertainty, however, our analysis suggests that the current standard of 50 microg/L is associated with a substantial increased risk of cancer and is not sufficiently protective of public health.