

## **Radon in Connecticut's Drinking Water Supplies CASE Study Finds Minimal Risk of Radon Exposure from Drinking Water**

HARTFORD, CT — A newly released study of health risks from radon in Connecticut's drinking water supplies concludes that exposure to radon in the state's drinking water supplies poses a minimal threat to public health, primarily by increasing overall exposure risk slightly when radon in the water is released into the household air. The study, "Radon in Connecticut: Quantitative Perspectives About Effects on Public Health," was conducted by a panel of experts convened by the Connecticut Academy of Science and Engineering (CASE) in response to an inquiry from the state Department of Public Utility Control (DPUC). The DPUC requested the study after receiving reports of radon in drinking water and requests for treatment of public drinking water supplies to reduce radon content.

The panel, chaired by CASE member Jan A. Stolwijk, Professor of Epidemiology and Public Health at the Yale University School of Medicine, found that the major adverse health effect of radon is an increase in lung cancer risk resulting from inhalation. According to the report, some adverse health effects, primarily in the stomach, may result also from the ingestion of drinking water containing radon, though the effect is "expected to be less than for inhalation." The study also found that existing data on the health effects of ingested radon were not sufficient to yield a meaningful estimate of risk.

Radon is a naturally occurring radioactive isotope that is one element in a chain of radioactive decay originating in uranium. Although most radon produced in the earth's crust remains in the soil and rock, some is constantly being released to soil gas or ground water, where it can be carried into the outdoor atmosphere, the indoor atmosphere, and, if the drinking water supply comes from ground water, into that as well. Indoor radon exposure can occur through inhalation of the radon entering a home in outside air and combined with radon released from the soil gas under the house; inhalation of radon released into indoor air from the drinking water supply (during showers, laundry, or other household tasks); and ingestion of radon in drinking water. The primary source of exposure to radon in drinking water occurs when the radon is released into indoor air through bathing, showering, cleaning, or other activities; in these instances, the radon is added to the indoor air concentration, resulting in increased levels of exposure through inhalation.

Radon exists in outside ambient air in concentrations of 0.1-0.4 picocuries per liter (pCi/l) of air; in indoor air in Connecticut, concentrations range from 0.1 to 38 pCi/l. Radon concentrations in Connecticut's ground water range from 50 to 500,000 pCi/l. Surface water has very low radon concentrations and does not contribute significantly to population exposure. Connecticut's drinking water supplies come from three primary sources: private wells, public surface water supplies, and public ground (below surface) water supplies.

The report recommends that efforts to reduce radon exposure in Connecticut be based on simultaneous considerations of exposure from both indoor air and drinking water supplies, and urges state officials to continue informing and advising the public of the risks of exposure and the remedies available for reducing exposure. Noting that no standards for radon content in drinking water currently exist at the state, federal, or international level, the panel does not recommend development of a drinking water radon standard for Connecticut at this time.

The report concludes that

"Indoor air concentrations of radon will depend on the concentration in the soil gas underneath the residence, on the degree of infiltration of soil gas into the residence, and on the rate of air exchange between indoor and outdoor air. For the majority of the population, most of the exposure to radon will be in the form of inhalation of radon in indoor and outdoor air. Radon in drinking water will produce human

exposure chiefly through the release of the radon into indoor air when water is used for bathing, showering, cleaning, and other domestic purposes.”

The report also notes that reduction of indoor radon concentrations resulting from soil gas infiltration is “the next most important strategy for lowering lung cancer risk” in the population, second only to reducing cigarette smoking — still “by far the most important contributor to overall lung cancer risk” in the United States.

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The summary and conclusions of the report are available on the CASE web site at <http://www.ctcase.org>. The complete report is available from CASE at (860) 527-2161.

*CASE is a private, nonprofit corporation patterned after the National Academy of Sciences. It was chartered by the Connecticut General Assembly in 1976 and is limited by statute to 200 members, who must live or work in Connecticut. One of the principal functions of the Academy is to provide science and technology information and advice on public policy issues, upon request of a government agency or private organization.*

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