Research finds short-term radon test kits are not effective in measuring radon gas exposure

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As awareness increases about the health danger of radon gas, more people are making the decision to test their homes for the deadly gas. A

University of Calgary led study finds the only reliable way to measure exposure to radon gas is with a long-term testing kit, which takes readings within the home for 90 or more days.

"Radon gas levels can fluctuate wildly day to day," says Dr. Aaron Goodarzi, Ph.D., assistant professor in the departments of Biochemistry & Molecular Biology and Oncology and member of the Arnie Charbonneau Cancer Institute at the Cumming School of Medicine (CSM). "Short term tests can give a false sense of alarm, or worse, a false sense of security as they cannot precisely predict long term exposure."

Researchers placed two test kits, a short term (five-day) and long term (90-day) in the same homes. Tests were conducted during summer and winter months. Findings showed the short-term kits were imprecise up to 99 percent of the time when compared to a long term test.

Radon is a known carcinogen. Health Canada lists radon as the number one cause of lung cancer in non-smokers. The gas is naturally occurring, colourless, and odorless. It can accumulate to unnaturally high and dangerous levels in homes. Health Canada has promoted the use of long-term testing kits for some time.

"Our recommendation was based on research from international authorities including the US and Europe," says Kelley Bush, manager, radon education and awareness Health Canada. "This research is critical because it provides Canadian data that confirms the value of long term testing."

Goodarzi has also been working with the Real Estate Council of Alberta (RECA) to educate realtors against using short term radon kits for real estate transactions.

"RECA is appreciative of the assistance provided by Dr. Goodarzi in the development of education enabling real estate professionals to advise buyers and sellers to take radon into consideration during the purchase and sale of a home, in the absence of reliable short-term testing," says Joseph Fernandez, director of education programs at RECA. "All real estate professionals have completed radon related education and new professionals will be required to complete it before entering the real estate profession."

The findings also show the Prairies are home to the second highest radon exposed population on Earth. The pan-Canadian scientist and physician led Evict Radon research initiative is now recruiting participation from all Canadians.

The research is aimed at gathering as much data as possible to understand and ultimately defeat Canadian's exposure to radon problem.

"We need to know exactly what factors influence high and low radon in Canadian homes. It's not just in the Prairies, we know of high concentrations in areas throughout the country," says Goodarzi. "This is easily one of the most preventable forms of environmentally-caused cancer. We have already learned so much from the work we've done in Alberta and Saskatchewan to test for and mitigate radon. We plan to build on that."

In addition to the data gathered on short-term testing kits, Goodarzi's team was also able to get a better understanding of how the size, design and age of home are related to radon gas exposure.

More information: Fintan K. T. Stanley et al, Radon exposure is rising steadily within the modern North American residential environment, and is increasingly uniform across seasons, *Scientific Reports* (2019). DOI: 10.1038/s41598-019-54891-8

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