Radon

What you can't see CAN hurt you

Each year, it's responsible for more deaths than brain cancer, melanoma, or bone cancer. People in every state in the Union and every country on the globe are exposed to it, often in their own homes. And while there are daily news reports about ensuring that drinking water is clean and food is pesticide-free, few people know about the simple, yet effective ways to protect themselves from radon, the second-leading cause of lung cancer deaths in the United States.

Bill Field would like to change that. Field, associate professor of occupational and environmental health and epidemiology in the College of Public Health, has studied radon since he came to the University to pursue his PhD 19 years ago. Currently, he is focusing his efforts on educating people about the dangers of radon and the ways to prevent exposure.

"There are no visual reminders of radon—it's colorless and odorless," Field says. "But it's radioactive, and if it were purple or some other color, people would see that it's all around them."

Radon is created when naturally occurring radium decays in the soil. It's found in especially high concentrations in areas such as the upper Midwest and the Reading Prong area of the East Coast, extending from Virginia to Connecticut. Field notes that while Iowa has the highest state average of radon concentration in the nation, radon is found throughout the United States and the world.

Although radon is all around us, it is particularly troublesome in enclosed spaces. The correlation between lung cancer and radon was first detected in studies of underground miners, who typically have much higher rates of lung cancer. Residential studies, including Iowa's, came later. Iowa was a particularly good place to test the long-term effects of radon due to its exceptionally stable population. Because radon seeps up from the earth, basements tend to be a home's area of highest concentration—radon can enter the foundation through cracks or holes in concrete floors and walls, construction joints, sump pumps, and loose-fitting pipes. As homes become more airtight, radon levels can increase. Depending on the type of furnace in a home, that radon-laden air may then circulate throughout the structure.

Charles Lynch, professor of epidemiology, became involved in radon research through the Iowa Cancer Registry. He and Field recently collaborated as part of a multicenter study that combined or "pooled" data from seven different residential North American radon studies and demonstrated that there was an 11 to 21 percent increase of lung cancer when there was a residential radon concentration of approximately 3.0 picocuries per liter of air, during an exposure period of 5 to 30 years. (The United States Environmental Protection Agency's [EPA's] current "action level" for residential radon is 4.0 picocuries per liter.) An analysis that pooled the results of radon studies performed in Europe and China found similar results. The results of these pooled studies provide "unambiguous and direct evidence of an increased lung cancer risk in residences where the radon exposure levels are at or even below the EPA's action level," Field says.

While the North American study results were just published last March, knowledge of radon and its effects is not new.

"More than 100 years ago, people knew that miners suffered from what was then called 'wasting disease,'" Field says. "In the 1970s, people put together epidemiologic studies that showed that miners had an increase in lung cancer related to radon exposure. About eight years ago, the National Academy of Sciences projected from the studies of miners to homeowners. Now direct evidence from residential studies clearly demonstrates residential radon exposure is a major public health risk."

Residential studies in the United States and Europe are complete, and Field and Lynch currently are involved in a study focused on pooling study results globally. In January of this year, the World Health Organization formed a task force, composed of five committees, to look at radon. Field is heading up the committee charged with developing guidelines for radon measurement and mitigation worldwide. Committee members represent more than 25 countries, and they hope, by the end of their four-year term, to have mapped the distribution of radon around the world, along with estimating the global burden of radon-related lung cancer.

"We also must weigh the relative risk of radon, depending on where it's found," Field says. "In some places, basic public health issues like good sanitation or hunger present a much greater relative risk for a population than radon."

In late June, Field was recognized by the Indoor Environments Division of the EPA for his achievements in spearheading effective radon risk reduction outreach programs. In addition to his international work, Field works with communities, organizations, and federal agencies to help inform Americans about radon and its risks. His achievements include working with communities throughout the United States to set up guidelines for radon mitigation requirements in new construction and assisting the EPA with its nationwide radon awareness campaign. But convincing people about the seriousness of radon exposure seems to be a tough sell.

"The number of lung-cancer deaths attributable to radon each year—21,000—tends to get lost when compared to the 140,000 annual lung-cancer deaths that can be attributed to smoking," Field says. "You can't see, smell, or taste radon, and there is no one to blame it on, so it doesn't seem to make as much of an impact."

"We're not very good at prioritizing risk and acting on this in our country," says epidemiologist Lynch. "There are many things in the world that put us at risk for disease, and there are many things we can do to prevent disease—high fat intake and tobacco use are not good for us, for example, if we're thinking of living a long, healthy life. Compared to those, dealing with radon is relatively easy."

—Linzee Kull McCray

Protecting yourself from the effects of radon

More than 20,000 Americans die from radon-related lung cancer each year. What can you do about radon exposure?

"Test for it; don't wait," says radon expert Bill Field. "Get informed."

Field recommends first using a state-certified, short-term test at the lowest-occupied level of a home. These generally test radon levels for two to 90 days. Then, if radon levels are high, a longer-term test can be used to confirm the initial test. Simple radon testing devices can be purchased at some hardware stores and through the mail: visit **www.epa.gov/radon** or call your state radon information office for test-kit providers.

If you're building a new house, a system for radon mitigation can be included for approximately $250. And if you're living in an older home, radon mitigation can be accomplished for an average of $1,500 to $2,000. Systems typically ventilate the air under the foundation and release it into the atmosphere before it has a chance to enter the home.

Don't assume that if your neighbor's test for radon comes back at an acceptable level that you don't need to test. Radon can vary greatly from house to house, even those that are right next door.

"Levels can vary and different methods of radon mitigation may be appropriate," Field says. "The first step to protecting yourself is to test."

Spectator

The University of Iowa
University Relations
300 PCO, Suite 370
Iowa City, IA 52242-2500
Fall 2005, Vol 39, No 1

EDITORS Linzee Kull McCray, Gary Kuhlmann

DESIGNER Kimberly Cooke

PHOTO EDITOR Tim Schoon

Published by The University of Iowa for alumni and friends.

Spectator is funded in part by the UI Alumni Association.

Readers who wish to change their mailing address for *Spectator* may call Alumni Records at 319-335-3297 or 800-469-2586, or e-mail alumni-records@uiowa.edu.

PHOTO BY TIM SCHOON