Radon and Lung Cancer

Anne-Marie Nicol, PhD

Assistant Professor, SFU
Knowledge Translation Scientist,
National Collaborating Centre for Environmental Health
CAREX Canada

Research objective: determine which carcinogens are priorities for policy and prevention work in Canada

- environmental- community exposures
- occupational- workplace exposures

Environmental results: Radon Gas

- most significant exposure in terms of lifetime excess risk of lung cancer
- highest environmental priority for population level impacts
Radon gas and cancer

“Exposure to Radon gas is one of the most important causes of lung cancer world-wide”

In 2010, ICRP concluded that radon presents a greater risk than has been previously calculated in 1993.
For every atom of Rn\textsuperscript{222} inhaled, four \(\alpha\)-particles are emitted, three in the first week.
Alpha radiation causes DNA damage

Slide created by Dr. Aaron Goodarzi, Canada Research Chair for Genome Damage and Instability disease used with permission
Alpha radiation is powerful, but over a short distance.

In the lung and respiratory tract, the alpha radiation “rips through” DNA bonds.

This type of clustered damage is more difficult to repair properly than other forms of DNA damage.

↑ DNA damage = ↑ error = genetic mutation = cancer
Strategies for reducing risks
Education and priority setting

Radon exists across the country

Current Canadian strategies require awareness of radon for:
- Public Health
- Provincial Governments
- Health Researchers and
- the public

Building Codes, testing programs and remediation require:
- training
- education
- expertise

EPA Map of Radon Zones

Radon Potential Map

*All dwellings need to be tested for radon; wide variations can occur in all three zones.
Statistics Canada: Households able to correctly describe radon gas (%)
Households* (%) that have tested for radon gas†

*As a percentage of all households that did not live in an apartment and had heard of radon

†Survey notes to use data with caution
Why aren’t people testing?

- The absence of regulatory requirements means leaving change to the realm of personal action
  - People need to be aware and be **motivated**
    - Denial, invisible nature of gas all contribute
  - Few studies have found strategies that increase testing
- Test kits still aren’t readily available in all parts of the country
- People fear the downstream costs of remediation
Reducing lung cancer risk from radon gas

- More leadership: legitimize the risk of living with radon - more than just one agency
  - Multiple levels of government and public health
  - Building trades, researchers, real estate
  - Building radon out to save future lives

- Provide financial incentives and support
  - Many options from other countries
    - Tax credits, renovation incentives, etc.

- Workplace exposure can also be significant
  - More testing and remediation requirements for workplaces
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THANK YOU