

Radon is a known carcinogen (Group 1)

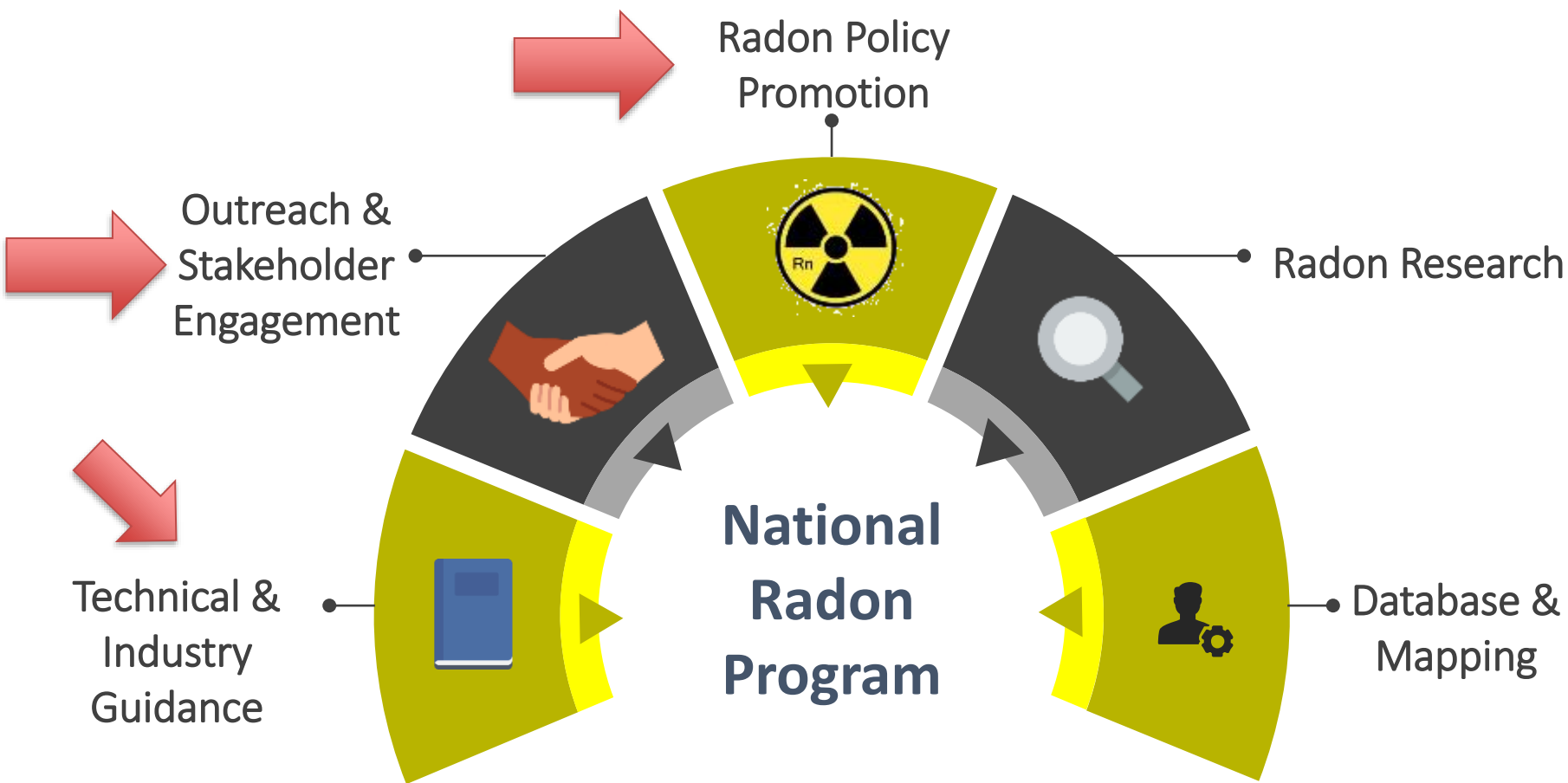
NATIONAL RADON PROGRAM

Awareness into Action

Health Canada – Radiation Protection Bureau
April 2024



HEALTH CANADA'S NATIONAL RADON PROGRAM



2023 OUTREACH PROGRESS & PRIORITIES

- [PT / Municipal Radon Action Guides \(RAG\)](#)
- NEW* [Radon Gas Causes Lung Cancer postcard](#)
- *NEW [Radon and Energy Retrofits factsheet](#)
- Radon Outreach Contribution Program

HC Outreach Efforts	2008-2023
Outreach materials distributed	16,000,000
Web page views	2,500,000
Public inquiries	21,500
Outreach & Media events	3500

RADON AND ENERGY RETROFITS

WHAT IS RADON?
Radon is a radioactive gas that comes from the breakdown of uranium in soil and rock. It enters air and can accumulate to high levels and can become a health risk.
Radon is the #1 leading cause of lung cancer for non-smokers. The risk of cancer increases with higher levels and longer exposure to radon gas.

ENERGY RETROFITS CAN INCREASE RADON GAS IN HOMES:
In Canada, there is a device for more energy efficient homes. Energy retrofits in new homes lead to lower energy use, reducing the cost of heating and cooling homes and the impacts of climate change.
Energy efficiency / retrofits to homes include:
• increasing air tightness:
- sealing cracks and openings,
- replacing windows, doors, and
- adding insulation.
Airtight buildings reduce energy loss, but they can also impact indoor air quality. Energy retrofits can reduce air exchange and inadvertently increase radon levels. Research results show links between residential building energy efficiency programs and increased radon exposure.

INTERNATIONAL RESEARCH PROVIDES URGENT INSIGHTS FOR THE CANADIAN HOUSING SECTOR
The U.S. Department of Energy 2020 Building Assessment of Radon Reduction Intervention and Energy Retrofits (BARR) summarizes pre and post-energy retrofits efforts on radon levels. This research shows reducing energy costs increased radon levels by 22% on average.

COUNTRY	REDOORING / AIR SEALING	INSULATION	REDUCTION IN RADON LEVELS
Germany Phase 2016	Reducing radon levels in existing buildings	60%	
Canada Toronto at JC 2022	Reducing radon levels	6%	
Switzerland Phase 2016	Reducing radon levels	5%	

REDUCING RADON IN HOMES
Some common ways to reduce radon levels in existing buildings include:
• Installing a radon mitigation system (e.g., active soil depressurization system).
• Sealing radon entry points in the foundation.
• Ventilation through a balanced heat/energy recovery ventilator system.

All homes need to be tested if your radon test result is above the guideline of 200 Bq/m³. Health Canada recommends that you hire a mitigation professional certified under the Canadian National Radon Proficiency Program to help you find the best way to reduce the radon level in your home.

Test your home. Know your level. Protect your health.

- 1 TEST
- 2 ASSESS
- 3 TAKE ACTION

www.canada.ca/radon
www.takeactiononradon.ca/test

Take Action on Radon (TAoR) Network and Campaign

- [100 Test Kit Challenge](#) and [Mitigation rebate programs](#)
- [White Ribbon Program](#): Focused on families with lung cancer.
- TAoR [Smoker's Helpline Radon Program](#)

RADON GAS CAUSES LUNG CANCER

Lung cancer is the most common cancer in Canada and has a low survival rate. Long-term exposure to radon is the #1 cause of lung cancer for non-smokers. Too many non-smokers do not think they are at risk of developing lung cancer.

3,000+ CANADIANS a year die from radon-induced lung cancer.	30% OF CASES are non-smokers.	19% PROBABILITY of surviving lung cancer (5 years).
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All homes have radon gas, the question is - how much?
You can reduce your risk of radon-induced lung cancer. The first step is to test your home.
www.takeactiononradon.ca

Find out more:
www.canada.ca/radon

RADON ACTION MONTH 2023

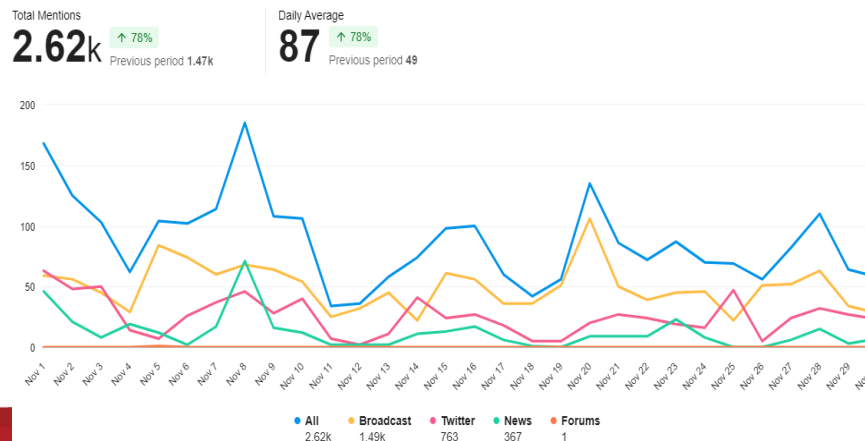
Informing and empowering Canadians - HC communications and social media

Products:

- Ministers statement
- Radon Postcard – 1.4 million
- Social media, Blog post on radon and energy efficiency and radon podcast and proactive media relations
- Banner on all Health Canada social media channels for the month of November
- Web visits and page views in 2023 were **25% higher** than in 2022.

Top Keywords

healthy canadians podcast awareness
 house radioactive gas non-smokers health information colourless
 cancer levels homes risk radon levels lung cancer leading exposure
 basement website radon soil home family clean air radon gas
 season effects high radon levels province elevated levels
 radon exposure





TORONTO STAR

News 10
Views: 1,180

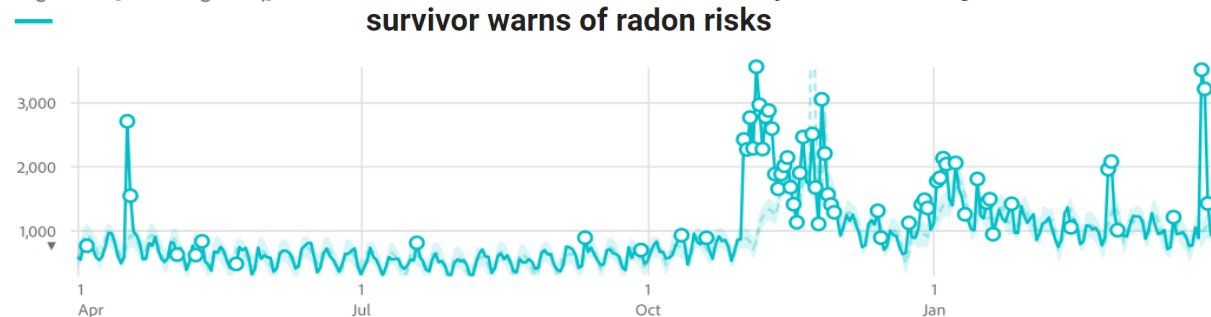
She found out she'd been breathing a cancer-causing gas for over a decade. So why won't Canada's health-care system let her get her lungs tested?



Radon testing increases after N.B. woman shares story of can...

'I didn't think it would be in my house': Lung cancer survivor warns of radon risks

Page Views [Radon Pages Req]



- ANNUAL web visits and page views **increased by 12%** in 2023 (338,132)
- Spikes in April, November and March – media articles about radon lung cancer victims – AB, NB, ON
- 37% increase in outbound links to radon test kit purchases / TAoR
- Over **60%** of web visits are now by mobile device
- ~ **75%** of web views goes to top 5 pages -

1. Radon: Testing your home	45,369	18.9%
2. Radon: About	36,618	15.2%
3. Radon - Reduction Guide for Canadians	34,947	14.5%
4. Radon gas: it's in your home	31,946	13.3%
5. Guide for Radon Measurements in Residential Dwellings	30,504	12.7%

NEW RADON POSTCARD 2023

Redesigned postcard to emphasize link between radon exposure and lung cancer risk. QR codes were also added.

- **770,000 postcards (November 2023)**
 - Regions where 26% + homes tested above Guideline
 - QR code directed to www.takeactiononradon.ca
- **690,000 (January 2024)**
 - Regions where 16 – 26% homes tested above Guideline
 - QR code directed to www.test4radon.ca - new digital radon education platform



A distinct connection was observed between regions that received postcards and a rise in website traffic. This trend was also evident in QR codes use.

TEST4RADON.CA

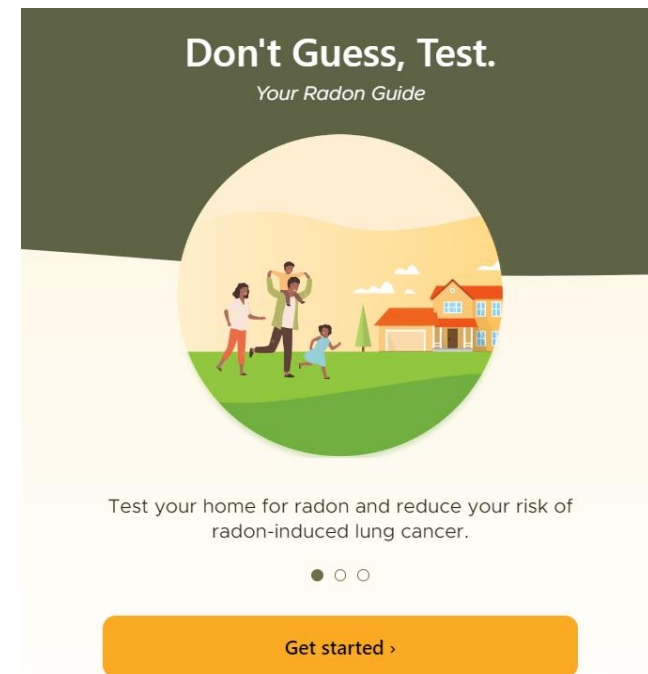
- A new digital education platform specifically designed to motivate behaviour change
- A self-directed radon education journey
 - answers frequently asked questions in real time
 - depending on each Canadian's unique situation, it prompts them to take action by purchasing a test kit, hiring a mitigation professional, or **adding digital calendar reminders** to return their long-term test kits after 3-months.

January (postcards delivered 1st week)

- 13,078 sessions
- 9,993 engaged sessions
- 8,985 completed basic education (made it past the intro pages)
- 6,032 reviewed mitigation steps
- 505 completed the whole journey

February

- 1,493 sessions
- 916 engaged sessions
- 685 completed basic education (made it past the intro pages)
- 449 reviewed mitigation steps
- 35 completed the whole journey



RADON OUTREACH CONTRIBUTION PROGRAM

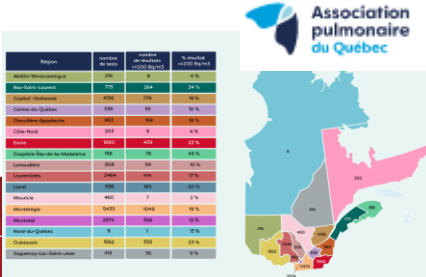
- One step directed solicitation process: invitation to submit proposals.
- Potential applicants include provincial or community-based NGOs, regional health authorities, indigenous organizations and academic institutions.

Examples:

- **National** – Canadian Association of Nurses for the Environment - Meeting the needs of **new parents** through a nursing knowledge translation project with an **equity focus**
- **MB:** Radon awareness for **low income** households and **minority communities**
- **ON:** Development of a **provincial radon database**
- **NS/NB/PEI:** Established an **Atlantic Radon Working Group** including government, non-profit, universities, and privately industry. Setting up a library **lending program** in NB.
- **BC:** BC Cancer Research Institute **Lung Cancer Screening** and Early Detection in **Never Smokers**
- **SK:** **Radonkills.ca** – Radon reduction action promotion, policy advocacy and financial support for mitigation
- **QC:** Quebec radon risk map, targeted municipal campaigns and **energy efficiency testing project**



CHECK OUT RADON:
RADON SCREENING LENDING KITS

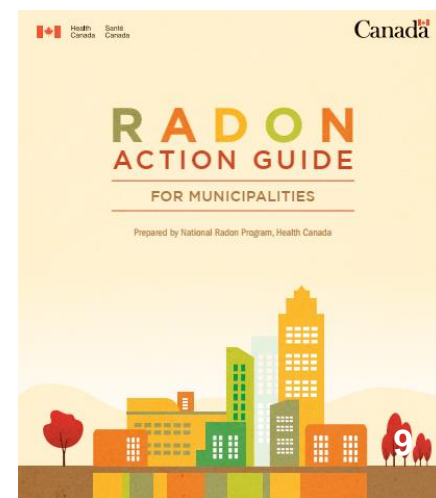
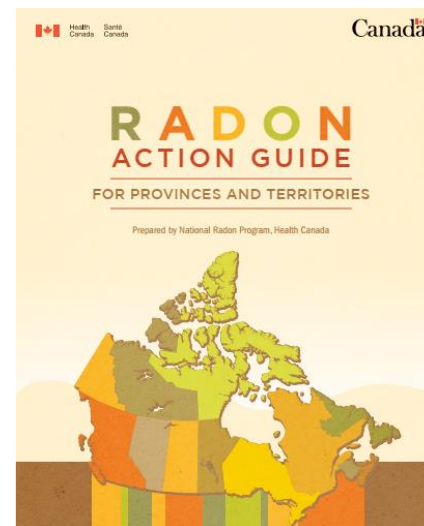


HEALTH CANADA'S RADON ACTION GUIDES (RAGS)

Engaging jurisdictional authorities and encouraging radon reduction action / policy / engagement is a **key priority**

The Radon Action Guides (RAGs):

- Describe why radon action is important
- Describe the regulatory and policy actions that provinces, territories, and municipalities in Canada can take
- Include examples of radon policy and regulatory action in Canada and internationally and draft language that can be used in policies / regulations / bylaws
- **100+% increase** in web visits in 2023-24 – over 2500 visits to the RAG-PT and 2000 for the RAG-M



HEALTH CANADA'S NATIONAL RADON PROGRAM



NATIONAL RADON PROGRAM: PRIORITIES

Technical & Industry Guidance:

- Updating **Canadian Building Codes** to reduce radon in new construction
- Response to 2019 Integrated Regulatory Review Service Report re: **Radionuclides in Building Materials**
- Updating HC guidance for radon measurements in **Residential Dwellings**

Database and Mapping:

- Working towards the eventual publication of the **Federal Buildings Survey** dataset on the Open Government platform
- Bidirectional data sharing agreements with provincial/territorial governments and universities
- Supporting database and mapping initiatives (ex. **B.C. Radon Repository**)

NATIONAL RADON PROGRAM: PRIORITIES

Work to inform Guidance/Policy:

- Assessing the **Seasonal Variation** of radon throughout Canada
- Evaluating the performance of consumer-grade **Electronic Radon Monitors**
- Collecting evidence to support strengthening of **2010 National Building Code** measures
- Supporting various research activities through the **National Research Council (NRC)**
- Investigating **Screening Capacity** of short-term measurements (<3 months)

TECHNICAL & INDUSTRY GUIDANCE: CANADIAN BUILDING CODES



CGSB publishes 2 standards related to control of radon in homes:

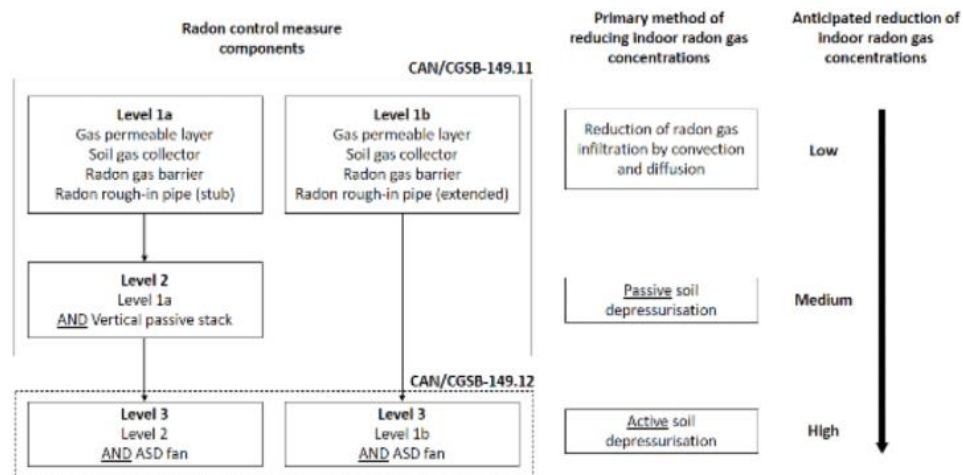
CAN/CGSB-149.11-2019 [Radon Control Options for New Construction in Low-Rise Residential Buildings](#)

CAN/CGSB-149.12-2017 [Radon Mitigation Options for Existing Low-Rise Residential Buildings](#)

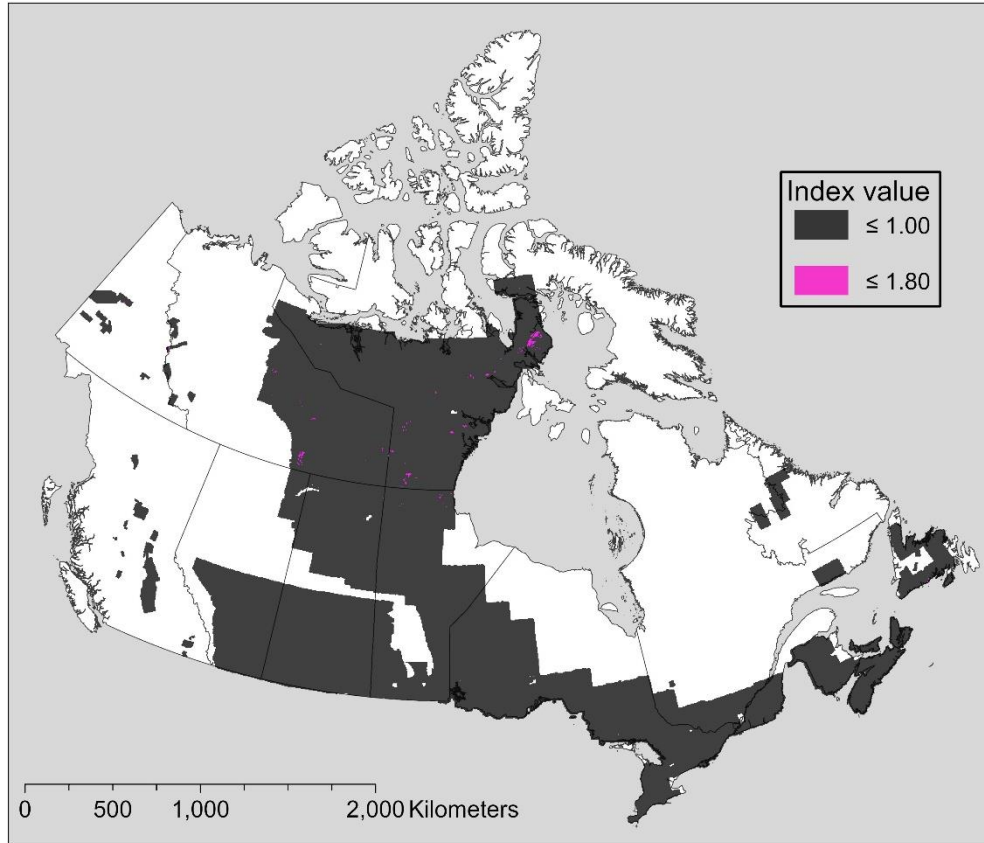
2023-2024 highlights:

- April 2024 status: CGSB 149.11 is awaiting publication. CGSB 149.12 committee ballot from March 8th to April 18th, 2024. Comments are currently being collated for input.

- National Building Code (NBC) Task Group for Radon and Soil Gas Mitigation have proposed code request ([Proposed Change 1713 \(cbhcc-cchcc.ca\)](#)) to include the vertical passive radon stack in the 2025 NBC.



TECHNICAL & INDUSTRY GUIDANCE: SURVEY OF GAMMA EMISSIONS FROM BUILDING MATERIALS



Building material classification	n	$I_{\bar{x}}$	I_{\max}
Aggregate	25	0.286	0.975
Structural clay brick	1	0.690	0.690
Granite veneer	1	0.595	0.595
Concrete	13	0.264	0.367
Polymer insulation	2	0.255	0.349
Asphalt shingles	1	0.260	0.260
Concrete architectural stone	1	0.236	0.236
Granite	1	0.163	0.163
Mineral wool insulation	1	0.146	0.146
Fibreglass insulation	1	0.098	0.098
Marble veneer	1	0.095	0.095
Drywall compound	1	0.063	0.063
Gypsum board	2	0.056	0.060
Stone	1	0.008	0.008

TECHNICAL & INDUSTRY GUIDANCE: UPDATING GUIDANCE

Current guidance on testing provides a conservative estimate of an individual's annual average radon exposure

Feedback: testing instructions are too restrictive

Re-evaluating the assumptions in this guidance has the potential to make protocols less restrictive and testing more accessible to Canadians

Currently updating Health Canada's residential testing guide and providing supplementary guidance on:

- Detector placement
- Mitigation timeline post-test
- Electronic radon monitors
- Reporting & Interpretation of results



WORK TO INFORM GUIDELINES & POLICY: ELECTRONIC RADON MONITORS

Technology is increasingly popular with consumers because it is intuitive and provides almost real-time feedback

Key concerns:

- Recent examples of products being withdrawn/recalled for not being reliable
- Lack of 3rd party testing
- No official guidance on their use and interpretation of data for consumers

Response:

- Implementation of HC testing program
- Improvements to testing protocol to adhere to international best practice
- Increasing testing capacity



WORK TO INFORM GUIDELINES & POLICY: ELECTRONIC RADON MONITORS

- Short-term (~14 days) testing of all commercially available devices
- Long-term (>3 months) testing through a partnership with SNOLAB
- Product recalls, where applicable
- Complementary to performance testing under C-NRPP
- Preparation of guidance relating to the use of ERMs
- Ongoing dialogue with industry
- Factors affecting performance



WORK TO INFORM GUIDELINES & POLICY: SEASONAL VARIATION STUDY

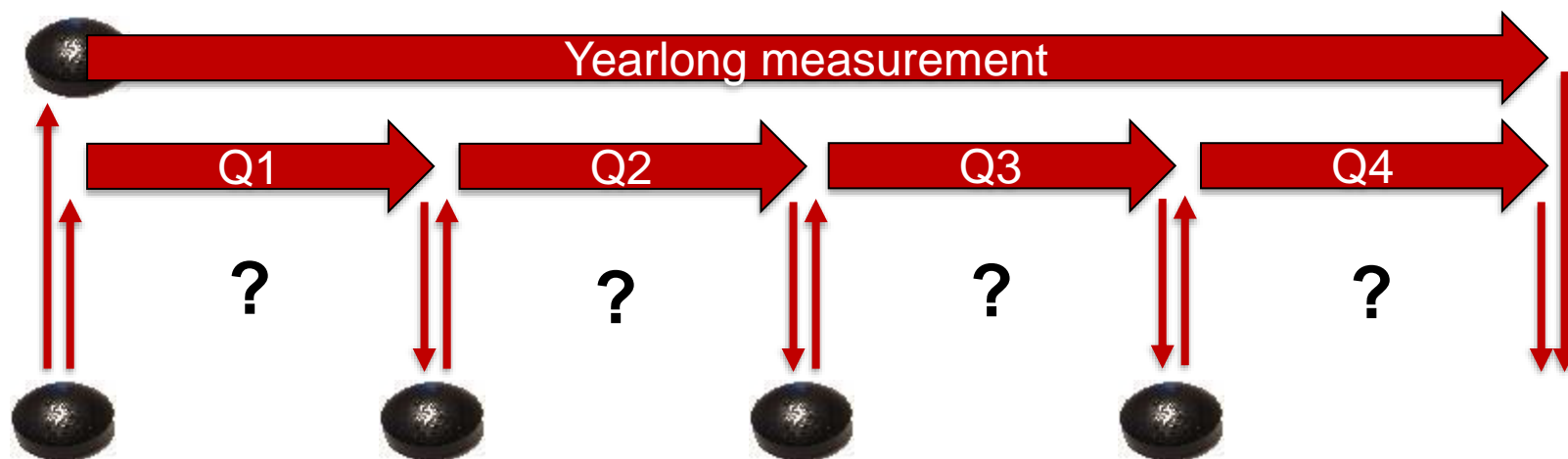
Major radon survey of radon levels in all home types, construction years, etc.;
aiming to open up the radon testing season

Conventional assumption for continental climates is that radon is higher during
the heating season

Series of quarterly measurements by each participant

Compared to a year-long measurement performed concurrently

Rolling start (additional cohorts of participants expected)



WORK TO INFORM GUIDELINES & POLICY: SEASONAL VARIATION STUDY

Objective: to determine the seasonal variation of radon levels in homes across Canada.

First participants commenced testing on **September 1st, 2023**

To date: **322 active participants** testing their homes, **>400 signed up for potential recruitment**

Quarter	Number of participants
Q1	58
Q2	65
Q3	199
Total	322



WORK TO INFORM GUIDANCE & POLICY: ASSESSING 2010 NBC MEASURES

Measured radon concentrations in homes built between 2001-2010 and 2012-2021 in both Halifax and Winnipeg

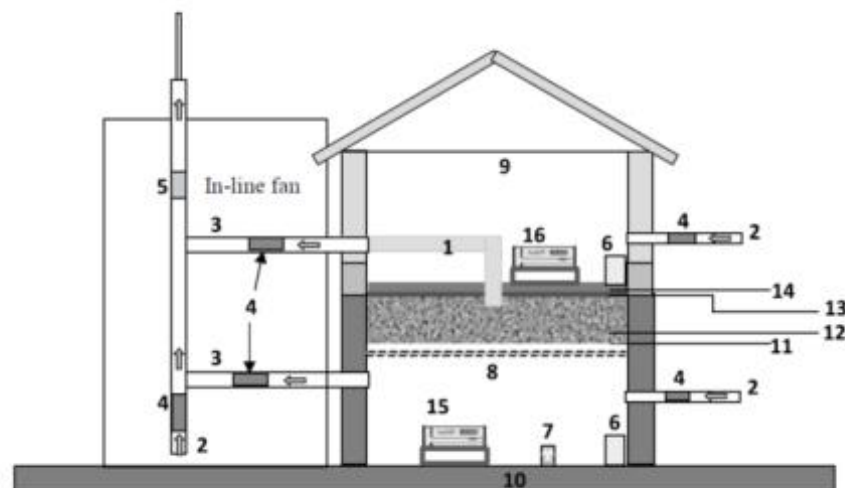
Results from Halifax cohort indicate that for detached housing, indoor radon is higher when the house was built after the building code change (by about 75 Bq/m³)

Similar trend present for Winnipeg, but not statistically significant – floor on which the detector was placed was the only significant predictor

City/ build year	Halifax 2001-2010	Halifax 2012-2021	Winnipeg 2001-2010	Winnipeg 2012-2021
detached	138	94	82	70
semi-detached/ townhouse	13	16	2	17

WORK TO INFORM GUIDANCE & POLICY: NATIONAL RESEARCH COUNCIL

- Field studies on the effectiveness of PSD systems
- Evaluating the performance of 10 mil (0.25 mm) poly vs 6 mil (0.15 mm) polyethylene barriers
- Impact of energy retrofits on radon
- Effectiveness of HRV/ERV at controlling indoor radon



1-Radon ASD stack; 2-Makeup air stacks; 3-Exhaust stacks; 4-Control dampers; 5-In-line fan; 6-Baseboard heater; 7-Radon source; 8-Dosing compartment; 9-Receiving compartment; 10-Concrete foundation pad; 11-Perforated stainless steel plate; 12-Gravel (8"); 13- Air barrier test sample; 14-Concrete floor slab; 15- AlphaGuard PQ 2000 Pro on a stand in dosing compartment (diffusion mode); 16- AlphaGuard PQ 2000 Pro on a stand in receiving compartment (diffusion mode).



National Research Council

NRC-CMRC
Canada

WORK TO INFORM GUIDELINES & POLICY: SEASONAL VARIATION STUDY

The study set to continue for several more years
First dataset anticipate Fall 2024



*AI generated image from prompt
'seasonal variation of radon levels, Canadian
style'*

Spread the word!

Health Canada is always looking for candidates to participate in future radon studies.

Do you want to join in future radon research? Scan the QR code, or email:

radonsurveys-enquetessurleradon@hc-sc.gc.ca



Scan here!

Radon: About

About

[Testing your home](#)

[For professionals](#)

[Action guides](#)



Participate in a [radon study](#).

canada.ca/radon

THANK YOU/MERCI



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