

National Radon Program

Health Canada

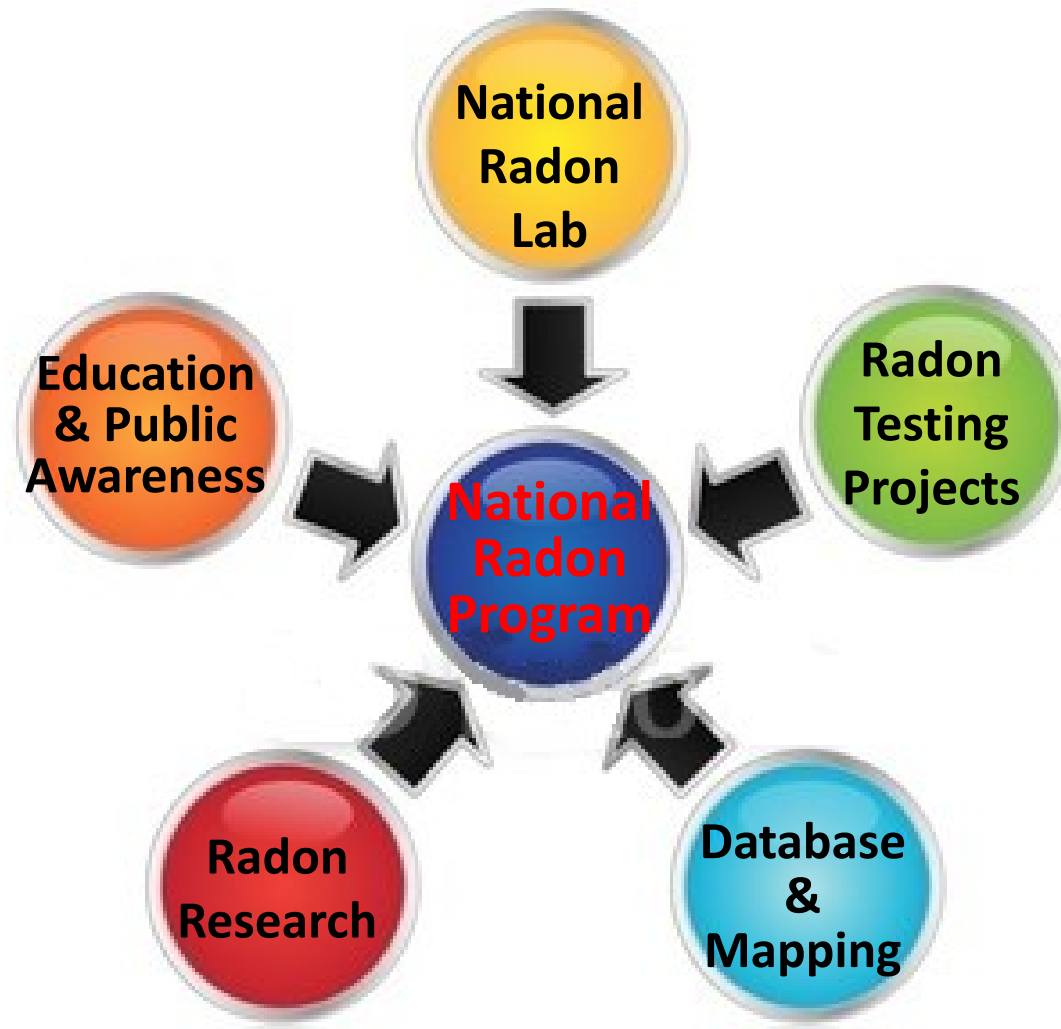
CARST 2016 Symposium-Montreal, April 24-27, 2016

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YOUR HEALTH AND SAFETY... OUR PRIORITY.

NATIONAL RADON PROGRAM



NATIONAL RADON PROGRAM

Technical Operations Highlights:

- **Federal Building Testing Program** – more than 20,000 buildings tested to-date-roughly 4% above the 200 Bq/m³ Canadian guideline
- **2010 National Building Code** for protection against radon ingress, and support for provincial and municipal building code changes
- **Residential surveys:** Cross Canada Radon and a smaller Radon-Thoron survey
- Development of **radon measurement and mitigation guidance documents**
- Data provision to support **radon potential mapping methodology, various research** and **policy changes**
- Development of **Canadian National Radon Proficiency Program (C-NRPP)** certification program for radon measurement and mitigation professionals
- Development of **National standards for radon in new and existing construction** with Canadian General Standards Board (CGSB)

NATIONAL RADON PROGRAM

Cross Canada Radon Survey (all Health Regions) vs Radon-Thoron Survey (33 Census Metropolitan Areas = largest cities in Canada-70% of Canadian population)

- Participants for both surveys were recruited by telephone using random digit dialing
- Participants tested on the lowest occupied level of their home
- Long-term alpha track detectors were utilized
- 96% of participants conducted a test of at least 90 days duration, 0.1% tests less than 30 days duration
- Raw arithmetic means comparable for the 2 surveys (97 and 96 Bq/m³ respectively)
- For the larger geographic-based 2-year survey, the raw arithmetic mean was stable from year 1 to year 2 at 97 Bq/m³
- Open Data posting at some level this year



NATIONAL RADON PROGRAM

Canadian National Radon Proficiency Program (C-NRPP)

- Certification program was put in place in 2011 and managed by the NRPP
- The Canadian C-NRPP program was launched in 2012 and was fully Canadianized in 2014-administered by Canadian Association of Radon Scientists and Technologists (CARST) with support from Health Canada
- QA Program Implemented
- Exam success rates and number of radon professionals continues to increase (331 Measurement/179 Mitigation)
- Working with Radiation Safety Institute to have a certified secondary radon chamber in Canada to support the C-NRPP program

NATIONAL RADON PROGRAM

Development of National Radon Mitigation Standards

- Agreement with the Canadian General Standards Board (CGSB) to develop two National Standards for Canada:
 - Radon Control Options for New Construction in Low Rise Residential Buildings
CAN/CGSB149.11
 - Radon Mitigation Options for Existing Low Rise Residential Buildings -
CAN/CGSB149.12

Public Review stage for both drafts ended in the fall



NATIONAL RADON PROGRAM

Development of National Radon Mitigation Standards

- Comments were addressed and changes were made to existing construction (149.12) draft
- Redline draft for 149.12 should be ready for committee ballot shortly
- Most comments were addressed for the new construction draft (149.11)
- TC Chair waiting for several TC members to provide their input for the final items requiring TC input
- Once this is completed, a redline draft for 149.11 would be prepared for committee ballot as well



NATIONAL RADON PROGRAM-RESEARCH

Research to Help Decide Which Way to Vent?

- Active Soil Depressurisation (ASD) Field study (REB 2013-0020) completed in fall 2015
- 52 homes with side-wall discharge/indoor fans in the Ottawa-Gatineau area
- Long-term indoor radon measurements (3-months) were performed during the heating season
- Average radon reduction ~ 90%
- Highest radon reduction ~ 99%
- Analysis of real-time continuous radon monitor (CRM) measurements near exhaust outlet to measure dissipation/dispersion

NATIONAL RADON PROGRAM-RESEARCH

Research to Help Decide Which Way to Vent?



NATIONAL RADON PROGRAM-RESEARCH

Research to Help Decide Which Way to Vent?

- Arrays of continuous radon monitors (CRMs) were set up at 5 homes with highest pre-mitigation radon levels
- Generally 10-15 CRMs were setup at different distances and directions away from the ASD exhaust point
- Weather station was setup on site to record weather parameters including wind speed and direction
- One CRM was also setup to measure outdoor background radon levels-far away from ASD outlet
- Outdoor CRM measurement duration was 6-8 hours
- Most instances radon reduces to BG levels in 1-2 m
- Possibility to follow-up with this cohort in future

NATIONAL RADON PROGRAM-RESEARCH

Research to Help Decide Which Way to Vent?

- A summary of the project was posted to the Health Canada Science Blog (subset of GC Science site) just before Christmas
- A public summary of the project has been written and we hope it is posted to the HC website soon
- Presented a poster at the Health Canada Science Forum in February
- Possibly a full scientific paper on the project as well
- Many thanks to [Rob Mahoney](#), [Marcel Brascoupè](#), and [Bob Wood](#) for participating in the project

NATIONAL RADON PROGRAM-RESEARCH

Mitigation Actions Follow-up Study (REB-2014-0005)

Objectives :

- Acquire data on radon mitigation rates in Canadian homes that tested above the 200 Bq/m³ guideline in our 2 recent large residential surveys
- Gather data on typical radon reductions achieved by various categories of mitigation strategies in Canadian housing stock/climates
- Gather data on reasons why Canadians have or have not mitigated high radon levels

NATIONAL RADON PROGRAM-RESEARCH

Mitigation Actions Follow-up Study (REB-2014-0005)

Methodology:

- Recruitment: Participants from 2 large residential radon surveys who tested above the 200 Bq/m³ guideline
- Telephone survey of participants regarding what mitigation actions were taken and/or why mitigation actions were not taken
- Offer a free post-mitigation radon test to harvest statistics on the radon reductions achieved by various mitigation strategies
- Possibility of longer-term follow-up with this cohort

NATIONAL RADON PROGRAM-RESEARCH

Mitigation Actions Follow-up Study (REB-2014-0005)

Study status:

- 64.5% of the valid sample participated in this telephone survey
- Overall ~29% (327/1132) of survey participants indicated they had performed some form of mitigation
- ~ 26% (294/1132) who performed some form of mitigation also agreed to participate in our free post-mitigation test
- ~ 90% of test kits were returned
- ~78% of these confirmed they tested on the same floor and were usable for statistical analysis of radon reductions

NATIONAL RADON PROGRAM-RESEARCH

Mitigation Actions Follow-up Study (REB-2014-0005)

Radon Reduction Trends:

Entry point sealing - not very effective ~ 11% average radon reduction

ASD - Mostly effective except for self-mitigated

Self-mitigated ~ 19% average radon reduction

Contractors ~ 81% average radon reductions

Certified Mitigators ~ 88% average radon reduction

Broad ventilation category ~25% average radon reduction

NATIONAL RADON PROGRAM-RESEARCH

Study on Indoor Air Quality and Its Determinants in Housing (IAQDH study) (REB 2014-0014)

- Characterize & evaluate IAQ parameters in 3 areas : Montreal, Ottawa, & Chaudière-Appalaches (rural area south of Quebec city)
- Partnered with HC Water and Air Quality Bureau (WAQB) staff for this study
- Field study : Radon testing along with other IAQ tests (CO, NO₂, Formaldehyde, particulates, RH, ventilation) in 144 residences (n=48 per geographic area)
- 135 radon tests were completed (94% completion rate)
- Similar % of homes above the radon guideline in these 3 areas as found in the cross-Canada residential survey
- Data was reported to participants by the Principal Investigator in late fall

NATIONAL RADON PROGRAM-RESEARCH

Assessment of Indoor Environmental Quality in Toronto Community Housing Buildings (REB 2014-0040)

- Determine impact of energy retrofit measures (windows, faucets, lighting, some heating, etc) in Toronto high-rise social housing on indoor environmental quality parameters (CO₂, ozone, formaldehyde, VOCs, heavy metals, temp, RH, radon)
- Partnered with University of Toronto Civil Engineering Dept./Toronto Atmospheric Fund (TAF)/Toronto Community Housing – multi-year project
- Occupant pre-retrofit questionnaire response data will also be used as guidance for some of the retrofit measures
- After the energy retrofits are completed the same indoor environmental quality parameter measurements will be repeated during the same time of year to study the effect of the retrofits on indoor environmental quality parameters
- Pre-retrofit measurement results currently being analyzed-radon results were low (98% <30 Bq/m³), high =40 Bq/m³

NATIONAL RADON PROGRAM-RESEARCH

Assessment of Indoor Environmental Quality in Toronto Community Housing Buildings (REB 2014-0040)

- The project is now in the energy retrofit stage
- Our REB certificate was renewed for another year in February
- The retrofits will happen during 2016 and hopefully be completed in late 2016
- Current schedule is to conduct the post-retrofit IAQ parameter testing, including radon, in early 2017

NATIONAL RADON PROGRAM

Revised Testing Guide For Public Buildings

- Both the Guide for Testing of Public Buildings and the Guide for Testing Homes were published in 2008 and hence both of these documents were due for an update
- Much of the updating was centered around information that we gained from the testing of Federal buildings
- There was also some updating to provide information regarding the need for QA/QC in testing programs
- Also revisions to the guidance on testing devices with a particular re-emphasis on the need for long-term testing

NATIONAL RADON PROGRAM

Revised Testing Guide For Public Buildings

- The Guide for Testing Public Buildings has now been published and resides here :

http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radon_building-edifices/index-eng.php

- The Guide for Testing of Homes is undergoing modifications currently and should be published in the near future

NATIONAL RADON PROGRAM

CHBA Videos

- Established a contract with CHBA for the production of several videos related to radon in new construction
- Worked with Jon Eakes who created the videos
- There are 5 videos in total ranging from terminology through to sealing, passive stacks, and active systems

<http://www.joneakes.com/learning-curve/146-radon-in-english>

<http://www.joneakes.com/learning-curve/152-radon-en-francais>

NATIONAL RADON PROGRAM-RESEARCH

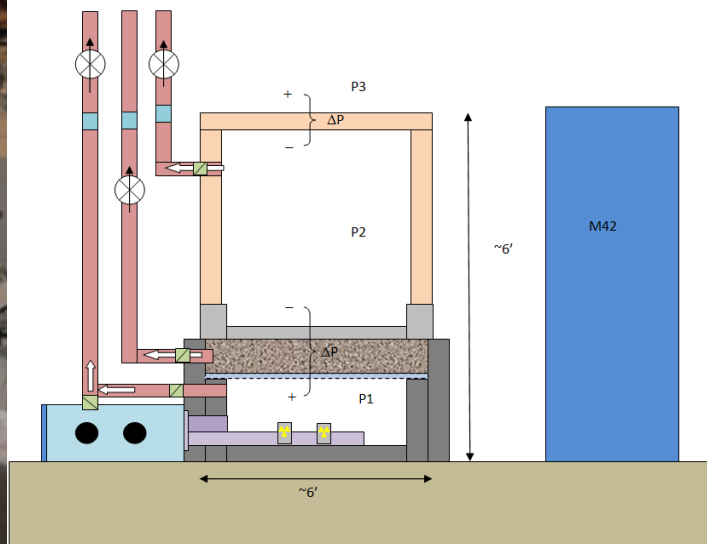
On-Demand ASD

- Assess energy savings potential of speed-controlled fans for Active Soil Depressurization systems
- Estimated an annual energy savings for two test sites:
- Site 1 (higher flow system):
- 57% electrical savings = 271 kWh
- 66% reduced exhaust flow volume = 2307 kWh
- Site 2 (lower flow system):
- 29% electrical savings = 105 kWh
- 59% reduced exhaust flow volume = 350 kWh
- Payback period would depend on the cost of the control loop system and whether running continuously at very low speed and then at higher speed as required has any impact on fan life

OTHER RADON RESEARCH - NRC

National Research Council (NRC)

- Passive stack geometries and insulation (CCHT)
- Research on radon entry into building envelope using the Radon Infiltration Building Envelope Test System (RIBETS)
- Gable-ended roof ASD discharge (IARL) to support CGSB standards
- Downdraft fans
- CCHT Renewal project - MURB



THE RADON RISK COMMUNICATION CHALLENGE

YOUR HEALTH AND SAFETY... OUR PRIORITY.



RADON RISK COMMUNICATION CHALLENGE

- Nobody knows about it – unfamiliar (not so much anymore😊)
- You can't see it, smell it or taste it
- There's no bad guy – it's naturally occurring
- The health risk is long term – not immediate
- It targets everyone – no at-risk population (like kids)
- Need for long term testing – everyone wants an immediate answers
- The risks that kill people and the risks that concern people are often completely different!

RADON E&A PROGRAM IN A NUTSHELL

- **2008-2010 – PROGRAM DEVELOPMENT** - focus was on developing materials, increasing availability of testing resources, engaging stakeholders and establishing public outreach programs
- **2011-2013 – DEPTH & BREADTH / REVIEW and ADVANCEMENT** - strengthened partnerships, refined risk messaging, developed targeted outreach programs and establishing RAM
- **2014-2016 – WATERSHED PROGRESS** – CBC special report in June 2014, Mike Holmes PSA, growth of RAM, significant increase in provincial/territorial/municipal and community engagement and action

AMAZING PROGRESS THANKS TO THE INCREDIBLE STAKEHOLDER INVOLVEMENT AND ACTION!!

- **2016 and Beyond** – Continue building on progress and what is working – Provinces, municipalities, industry and NGOs start taking the lead

PARTNERS



Radiation Safety
Institute of Canada
Institut de radioprotection du Canada
CELEBRATING 35 YEARS

Canadian
Home Builders'
Association



Santé
et Services sociaux
Québec



TAKE
ACTION
ON RADON

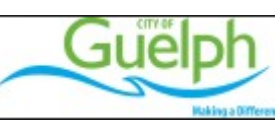


THE LUNG ASSOCIATION
L'ASSOCIATION PULMONAIRE

Canadian Cancer Society
Société canadienne du cancer



Canadian Environmental Law Association
EQUITY. JUSTICE. HEALTH.



RADON AWARE
THE LUNG ASSOCIATION™



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RADON - ANOTHER REASON TO QUIT

Lung Cancer Risk

Radon is a gas that is produced naturally by the breakdown of uranium in the ground and gets into your home undetected. You can't see it, smell it or taste it.

Some level of radon can be found in most homes. High levels of radon increase your risk of developing lung cancer.

The risk from radon exposure is long term and depends on 2 things:

- 1- the level of radon,
- 2- how long you are exposed, and
- 3- your smoking habits.

Radon levels very often go up as a long term detector and test for a maximum of 2 months.

Radon testing is available through certified service professionals or do-it-yourself kits can be purchased by phone, internet or at certain retail stores.

SMOKING?
TEST YOUR HOME FOR RADON!
People who smoke and are exposed to elevated levels of radon have a significantly increased risk of developing lung cancer.

The only way to know if you have a radon problem is to test for it. Testing for radon is easy and inexpensive.

Radon + Smoking = Dangerous combination!
Don't let the two leading causes of lung cancer stand in your way of a safe and healthy life.

QUIT SMOKING AND TEST YOUR HOME.

For more information contact us at 1-800 O Canada (1-800-422-4232) or visit us at radon@hc-sc.gc.ca or visit the Health Canada's website at www.healthcanada.gc.ca/radon

Canada

RADON OUTREACH

National

- **Promotion and Distribution** of radon outreach materials
- **NOVEMBER** is Radon Action Month
- **Canada Post's SmartMoves** program to 650,000 + homeowners
- **Pro-active radon engagement** with P&Ts
- **Events and conferences:** home shows, health care, real estate and home builders

Targeted

- **Physicians Online - Radon: Another Reason to Quit**
- **MacHealth** – Radon accredited continuing medical education course
- **Pro-active** engagement with **at risk** regions and communities
- **3 Point Home Safety Checklist campaign** – targeting families and childcare sector
- **Canadian Real Estate Association** - co-branded radon publication

TAKE ACTION ON RADON

Radon-Related Lung Cancers **16%**

Second leading cause of lung cancer

7% of homes in Canada have high radon

All homes should be tested

Available Reports and Publications

www.healthcanada.gc.ca/radon
radon@hc-sc.gc.ca • 1-866-225-0709

Canada

Home safety for your KIDS' sake

Check it ✓ today:

- ✓ **Smoke Detector**
Make sure you have a smoke detector on every level of your home and change the batteries every year.
- ✓ **Carbon Monoxide Detector**
Install carbon monoxide (CO) detectors on every level of your home. Locate them at or near bedrooms and change the batteries yearly.
- ✓ **Radon Test**
Protect your family from this harmful gas, the second leading cause of lung cancer. Get radon level A2 - available at hardware stores and online - to measure the radon level in your home.

FOR MORE INFORMATION: www.healthycanada.ca

Canada Health Canada Your health and safety... our priority. View postal or vote electronic - more private

RADON

REDUCTION GUIDE FOR CANADIANS

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TAKE ACTION ON RADON

OCCUPE TOI DU RADON

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RADON

A simple test can **save** your family

Un simple test peut **sauver** votre famille

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A Homeowner's Guide to Radon

Canada Health Canada Your health and safety... our priority. View postal or vote electronic - more private

CREA THE CANADIAN REAL ESTATE ASSOCIATION

2015-16 Highlights

- Health Canada continues to see an increase in the number of public inquiries, outreach activities, demand for radon materials and visits to the radon web pages
- In June of 2015 The House of Commons Standing Committee undertook a study of the main causes of lung cancer beyond smoking, including radon gas
 - Health Canada along with CPCHE, CELA, CAREX and BCCDC were all asked to appear as witnesses as a part of this study
 - Demonstrates the recognition of radon as a serious contributor to lung cancer in Canada thanks to all of the work that is done by all of the Radon Stakeholders!
- Successful 3rd Radon Action Month – advancement and improvements
 - Establishment of Provincial Leads
 - Communication with stakeholder committee early and more regularly
 - National advertising and promotion
 - Great stakeholder engagement

2015-16 Regional Highlights

BC

- Building code amended - passive stack for new constructions in radon rich areas
- Radon mitigation manuals in over 60 public libraries
- 5th Annual Radon Workshop
- RadonAware provincial program

AB and the North

- Yukon Govt took action in November to increase radon awareness & radon testing
- Media story in the Calgary Herald had tremendous impact on radon awareness, public inquiries and requests for radon test kits
- Collaborations progressing with industry and NGO stakeholders

ON

- Municipalities that have made or are considering changes to their building codes – Guelph, Thunder Bay, Windsor, St. Thomas and Elgin
- Radon article in the Journal of the Ontario Building Officials Association
- National Radon Webcast by the Canadian Cancer Society during RAM – Reached ~80 lung cancer survivors and their families

MB & SK

- Community Open Houses: 10 locations very positive response, media attention and increased test kit sales
- Take Action on Radon Saskatchewan Coalition: collaborative efforts & work planning
- Red River College Applied RADON Research: Engineering tech and Environmental students and Research Chair

2015-16 Regional Highlights

QC

- Travail de proximité avec des homologues provinciaux dans 5 directions de santé publique - Capitale NTL, Bas-Saint-Laurent, Outaouais, Estrie, Montérégie)
- 2eme année de sensibilisation du nord du Nouveau Brunswick – Cinq présentations et démonstrations
- 9 activités médias

ATL

- HC, NS Govt, NS Lung, and Acadia delivered first public Radon Workshop in Atlantic Canada.
- Partnered with Halifax Regional Municipality, Bathurst and NS Lung for 2 radon education and testing projects. An estimated 700 homes were tested.
- Northern NB Francophone Outreach: a series of 4 municipal mayor meetings, 6 radon cloud chambers demonstrations and 4 radon education lectures. Results - 2 municipal radon surveys were conducted in 2015 in that region.

CHALLENGES

- Lack of provincial and territorial government engagement and radon committee / working group that includes both govt, NGO and industry
- ON and QC building codes – lack of radon protection
- Policy Change: Increased awareness has not lead to sustainable policy decisions to support radon risk reduction
- Cost / lack of financial support - There are important segments of the population (low income, young professionals and families) who are not taking action simply due to cost.

RADON CME - CONTINUING MEDICAL EDUCATION COURSE

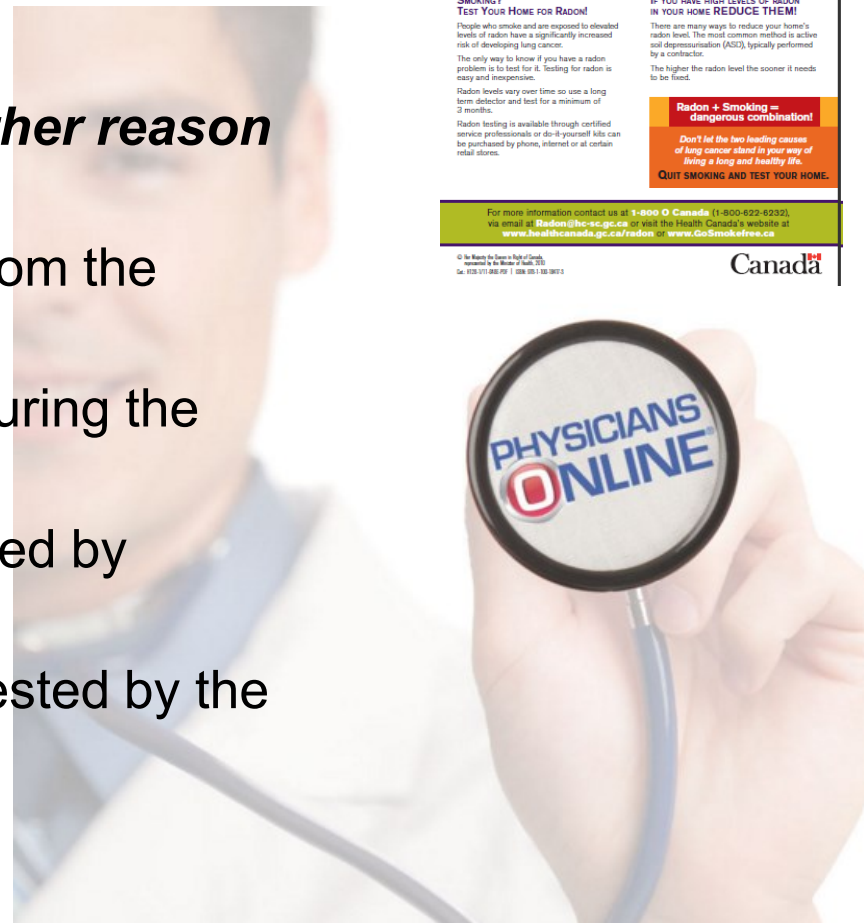
- **Focus on Promotion** - reaching out to professional associations and stakeholders across the country and asking them for their help in disseminating the course
- **Digital Marketing and Social Media** - Banner ads through CMAJ, the Cdn Healthcare Network and the Cdn Journal of Respiratory Therapists. Facebook, LinkedIn and Google Ad words
- Promotion has had a positive impact on raising awareness, course registration and completions
 - Promotional campaign led to an 813% increase in web visits and a 134% increase in registrations and 500% increase in completions – compared to the previous year
- MacHealth currently host over 25 courses. In 2015 Radon ranked #8 for the number of registrants and #2 for the number of course completions

PHYSICIANS ONLINE

- Physicians Online is a physician driven program making samples and information material available to physicians on a demand basis.

April 2015- March 2016: *Radon – Another reason to quit* factsheet distribution:

- 13% increase in factsheet distribution from the previous fiscal year.
- 60% increase in factsheet distribution during the month of November(RAM)
- 44% of the radon factsheets were ordered by Physician's in the province of Ontario.
- 88% of the radon factsheets were requested by the General/Family practice specialty.



2015-16 NEW OUTREACH PROJECTS

Scout Environmental –Radon Awareness and Energy Efficiency Program Pilot

As buildings are sealed for energy conservation there is a potential risk in increasing radon levels

PURPOSE:

- **Raise awareness and promote testing within the New Brunswick Power Home Insulation Energy Savings program**
 - In person discussions, distribution of radon and energy efficiency information and follow-up telephone survey.
- **Explore collaboration opportunities between energy efficiency programs and radon reduction promotion**
 - Evaluate effectiveness of combining radon education and testing into EE programs
 - Determine potential for integrating radon-related measures into existing utility-based rebate programs across Canada

EFFICIENT HOME. HEALTHY HOME.
Ensure your health and safety as you improve your home's energy efficiency! Increasing your home's insulation or sealing can yield significant energy savings, but may also lead to increased levels of radon gas – know your risk!

WHY DO I NEED TO KNOW ABOUT RADON?
Radon gas is found in almost every home in Canada.
In high concentrations, it can be a risk to the health of you and your family.

WHAT ARE THE ASSOCIATED HEALTH RISKS?
Exposure to high levels of radon in indoor air can increase your family's risk of developing lung cancer.
It is linked to approximately 16% of lung cancer deaths in Canada and is the #1 cause of lung cancer in non-smokers.

HOW CAN I TEST FOR RADON?
It's easy and inexpensive to test for radon.
There are two options:
1) Hire a certified radon measurement professional
2) Purchase a do-it-yourself long-term test kit

WHEN SHOULD I TEST?
Health Canada recommends testing between September and April, when windows are mostly closed.
If your home is undergoing an energy retrofit, testing should occur after the retrofit is completed to ensure results are accurate.

For more information on radon or to find a radon test kit or certified measurement professional, visit: **TakeActionOnRadon.ca**

MAISON EFFICACE. MAISON SAINÉ.
Protéger votre santé et votre sécurité alors que vous améliorez l'efficacité énergétique de votre maison! L'augmentation de l'isolation et l'étanchéité de votre maison peuvent procurer d'importantes économies d'énergie mais pourraient également entraîner des niveaux élevés de gaz radon. Connaissiez vos risques!

POURQUOI AURAIS-JE BESOIN DE SAVOIR AU SUJET DE RADON?
Le gaz radon est présent dans pratiquement toutes les maisons au Canada.
Des concentrations élevées peuvent poser un risque de santé pour vous et celle de votre famille.

QUELS SONT LES RISQUES POUR LA SANTÉ ASSOCIÉS AU RADON?
L'exposition à des niveaux élevés de radon dans l'air intérieur peut augmenter le risque à votre famille de développer un cancer du poumon.
Elle est liée à environ 16% des décès du cancer du poumon au Canada et c'est une des trois causes du cancer du poumon chez les non-fumeurs.

COMMENT PUIS-JE EFFECTUER UN TEST DE RADON?
Il est facile et pas cher d'effectuer un test radon.
Les deux options disponibles sont:
1) Engager un professionnel certifié de la mesure du radon
2) Acheter un détecteur de radon à long terme

QUAND DEVRAIS-JE FAIRE LE TEST DE RADON?
Santé Canada recommande d'effectuer un test entre septembre et avril lorsque les fenêtres sont le plus souvent fermées.
Si votre maison subit l'amélioration de l'efficacité énergétique, un test devrait être effectué après avoir complété l'amélioration afin d'obtenir des résultats précis.

Pour obtenir plus de renseignements sur le radon ou trouver un détecteur de radon ou un professionnel certifié de la mesure du radon, visitez: **OccupeToiduRadon.ca**

Radon Awareness & Energy Efficiency Pilot Program

SUCSESSES & CHALLENGES

PROGRAM SUCCESS

168

Conversations with NB homeowners about radon in home

145

Long-term radon test kit set-ups

CHALLENGE

Utility's concern with negative link between EE measures and high radon levels



SOLUTION

Promotional material with positive messaging that emphasizes utility's intention to help customers balance energy efficiency upgrades with indoor air quality

2015-16 NEW OUTREACH PROJECTS



CPCHE / Pollution Probe

Increasing radon awareness and action through workplace engagement

- Radon testing pilot competition to challenge employers at 30 GTA workplaces to test for radon and to encourage employees to test their homes
- Develop a radon action program for the new Healthy Communities national campaign, led by Pollution Probe, sponsored and championed by Great-West Life
- Initially faced widespread concerns from workplaces about liability when testing.
 - Developed options for workplace testing to overcome barriers – ex. engaging OHS committees



EXPECTATIONS EXCEEDED

- 45 participants, 150% original target
- Expanded due to national interest
- Reached seven provinces and 27 communities across Canada.



Thank You

