
TO: Chair and members of the Board of Health

MEETING DATE: February 1, 2017

REPORT NO: **BH.01.FEB0117.R03** Pages: 8

PREPARED BY: Bo Cheyne, Environmental Health Specialist
Leslie Binnington, Health Promotion Specialist
Shawn Zentner, Manager, Health Protection

APPROVED BY: Christopher Beveridge, Director, Health Protection

SUBMITTED BY: *Original signed document on file*
Dr. Nicola J. Mercer, MD, MBA, MPH, FRCPC
Medical Officer of Health & CEO

Recommendations

It is recommended that the Board of Health:

1. **Receive this report for information.**

Key Points

- Indoor exposure to radon gas is the second leading cause of lung cancer in Canada.
- The Canadian guideline for radon gas is 200 becquerels per cubic meter (Bq/m³).
- The Wellington-Dufferin-Guelph area seems to have more homes with radon levels above the guideline when compared with Ontario and Canada.
- In November of 2015 and 2016, Wellington-Dufferin-Guelph Public Health (WDGPH) partnered with Health Canada and the City of Guelph, to host public radon information sessions where an external radon professional sold radon test kits. Over the course of both years, 507 attendees came out and 310 test kits were sold.
- In September 2015, the City of Guelph initiated a Radon Gas Mitigation Program that requires radon gas mitigation measures in new construction as per requirements in the Ontario Building Code.

- The Ministry of Municipal Affairs is considering updates to the Ontario Building Code that will involve broader requirements for radon gas mitigation in construction of all new buildings across Ontario.
- An external radon professional is testing all WDGPH buildings for radon levels during the winter of 2017.

Discussion

Radon is a naturally-occurring, radioactive gas and is the second leading cause of lung cancer in Canada, second only to smoking.¹ This colourless, odourless, tasteless gas is formed by the breakdown of uranium in soil and rock.² Once formed, radon gas seeps up through the earth and can be drawn into buildings through cracks or gaps around service pipes in the foundation. Consequently, radon can enter homes and will sometimes accumulate to high levels.¹

The risk of developing lung cancer from exposure to radon depends on three risk factors: 1) the concentration of radon, 2) the duration of exposure, and 3) smoking habits. The higher the radon concentration, and the longer a person is exposed, the greater their risk of developing lung cancer.¹

The only way to know how much radon is present in a home is to test. Testing is easy to do and do-it-yourself test kits are affordable, starting around \$40. Test results should be compared with Health Canada's indoor air guideline for radon, which is 200 becquerels per cubic meter (Bq/m³). If radon levels are found to be high, a building can be remediated to lower radon levels. Health Canada recommends that remediation work should be undertaken by a certified radon professional. The most reliable remediation option involves installing a sub-slab depressurization system.³ This system acts like a vacuum that sucks gases from under a home's foundation and vents them to the exterior of the house, preventing radon gas from entering a home. Typical costs for a sub-slab depressurization system are approximately \$2,000 to \$3,000; this is comparable to some common home maintenance costs, like replacing a furnace.³

Local Radon Data

As part of a series of studies, Health Canada tested 194 homes in Wellington and Dufferin Counties, of which 131 test results were from homes located within the City of Guelph. Of the homes tested by Health Canada in the City of Guelph, 18% tested above the 200 Bq/m³ guideline. Of the remaining 63 homes tested by Health Canada in Wellington and Dufferin Counties, 10% tested above the guideline. The provincial and federal percentage values for population living in homes above the guideline are 4.6% and 6.9%, respectively (population-weighted percentages).⁴ Prior to drawing comparisons, there are some important factors to note. First, population-weighted percentages cannot be compared directly to a simple percentage of homes tested. Second, the number of homes tested was low, particularly outside of Guelph. Consequently, while provincial and national population-weighted percentage values should not be compared directly to the local percentages reported above, these values can be compared to identify possible trends in radon levels across Canada. For example, comparison

of local data against provincial and national data suggests our local area seems to have more homes with radon levels above the guideline when compared with Ontario and Canada.

Local Campaigns

Board of Health reports presented in March 2010 and February 2013 outline previous radon awareness raising efforts.^{5,6} WDGPH's very first radon awareness campaign targeted health care professionals, and was followed by subsequent campaigns that targeted the general public.^{5,6}

The general public campaigns took place during Radon Action Month in November. These campaigns aimed to raise awareness about local radon trends and radon testing. In 2012 and 2013, campaigns were fairly limited and focused on print media.⁶ In 2015 and 2016, WDGPH hosted drop-in information sessions for the public in partnership with Health Canada and the City of Guelph. A Health Canada radon expert supported each event by bringing information pamphlets and a small model house to help answer questions from the public about radon, how it enters homes, and why testing is important. At the Guelph session, a representative from the City of Guelph was present to answer questions about the City's Radon Gas Mitigation Program (discussed further below). Lastly, an external radon professional was available at every session to answer technical questions about testing and remediation and was also selling radon test kits approved by the Canadian National Radon Proficiency Program (www.c-nrpp.ca).

Four sessions were run over a two year period as summarized in the table below:

Year	Location	Attendance	Radon test kits sold (includes kits sold to staff at each office)
2015	Chancellors Way office (Guelph)	230	100
2016	Chancellors Way office (Guelph)	116	122*
	Alder St Recreation Centre (Orangeville)	71	31
	Centre Wellington Community Centre (Fergus)	90	57
TOTAL		507	310

*Reasons that the number of test kits sold was higher than the number of attendees may include: attendees sometimes purchased multiple kits, some staff in Guelph purchased kits who did not attend the session.

2016 Communication Strategy

The communication strategy used to promote the radon session in Guelph to the public in 2015 was used to inform expanding the campaign to Fergus and Orangeville in 2016. In 2016, communication strategies used included: Facebook posts and ads, Twitter posts, media releases, newspaper ads (Guelph Mercury Tribune, Orangeville Banner, and Wellington Advertiser), public service announcements on local radio, posters in the community (including libraries and recreation centers), the WDGPH website, and a WDGPH Stay Well Blog Post. Emails with event information and posters were also sent to community partners for circulation.

Uptake of these messages was generally positive. Earned media included an on-air interview and article with CBC Kitchener-Waterloo, articles on the Guelph Mercury Tribune website and

Magic 106.com website, and an article in the Waterloo Record. The Stay Well blog post “*Why You Should Test Your Home for Radon*” was the most viewed WDGPH blog post of 2016 (with 920 page-views). There were also 823 clicks on Facebook ads and 84 clicks on Twitter posts.

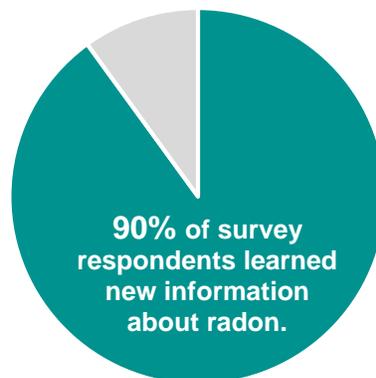
Several positive comments were received on social media. On Facebook, one person commented: “I have been wanting more info on this topic... so glad you are hosting this session”. On Twitter, people commented: “thank you for a very informative drop in. Very much appreciated”, and “thanks @WDGPublicHealth and @cityofguelph for answering my questions about radon tonight”.

2016 Event Feedback

A short feedback survey was created to evaluate the information sessions. In total, 100 surveys were completed (36% response rate): 50 in Guelph, 16 in Orangeville and 34 in Fergus. The response rate for the 2015 feedback survey was very low at 6%, consequently for the 2016 information sessions, the feedback survey was kept short to achieve a higher response rate. Future sessions will include a survey to collect information on “who” is attending our sessions such as demographic and geographic information, as well as a question to identify homeowners vs. renters. This will help inform where additional promotional efforts are needed and support evaluation of the overall campaign.

The most common ways that people heard about the radon sessions were newspaper ads (42%), Facebook ads (12%), radio (11%), and word-of-mouth (11%). In Orangeville and Fergus, the location of a recreation center was an effective recruitment source: 18% of survey respondents indicated they attended because they saw the session while walking through the recreation center.

The sessions were successful in increasing attendees’ knowledge of radon and its health effects, as illustrated in the chart below:



Survey respondents also indicated what they felt was the most beneficial aspect of attending the radon session: it increased their knowledge about radon (58%), the location was convenient (65%), and it was an opportunity to ask questions (75%) and to purchase a test kit (84%). Finally, 92% of survey respondents indicated that they intend to test their home for radon.

Some survey respondents shared additional comments, including positive feedback about how the event was useful in raising awareness of radon and for WDGPH to “keep informing the population of the dangers of radon gas”. Suggestions were provided for future sessions, such as a more accessible location in Guelph and more local advertising of the event.

City of Guelph Radon Gas Mitigation Program

The City of Guelph Radon Gas Mitigation Program – initiated in September 2015 – requires radon gas mitigation measures as per requirements in the Ontario Building Code that are indicated for areas where radon gases are known to be a problem.⁷ The program only applies to new construction; including, residential buildings and most additions, as well as industrial, commercial, and institutional buildings.

The program requires that new buildings have to be built using construction methods that minimize radon entry. Additionally, some of these buildings are subsequently subject to radon gas testing once the building is occupied (the radon gas testing is either mandatory or voluntary depending on the radon gas mitigation option selected). The Radon Gas Mitigation Program is run by Building Services at the City and enforced by building officials.

Proposed Legislation and Advocacy for Legislation

Building Code

The Ministry of Municipal Affairs is considering broader requirements for radon mitigation in construction of all new buildings across Ontario (currently the Ontario Building Code includes mandatory radon mitigation requirements for three specified areas in Ontario, in addition to other areas where radon gas is known to be a problem).⁸

Proposed changes to the Ontario Building Code include amending the existing code to require that all new buildings in Ontario are constructed using techniques that will 1) minimize radon entry from the soil, and 2) enable future radon remediation if needed.

Tenants

Ontario announced in the spring of 2016 proposed updates to the Long-Term Affordable Housing Strategy, which would include changes to the *Residential Tenancies Act, 2006*. Among the items outlined is a proposal to explore opportunities to protect Ontario tenants from the potential health-related impacts of radon and review approaches to address radon safety in rental housing.⁹

Tax Credit Advocacy

The Canadian Environmental Law Association has written to all federal Members of Parliament encouraging the federal government to consider a radon mitigation tax rebate in the 2017 budget.¹⁰

Testing WDGPH Buildings

Over the winter of 2017, a certified radon professional is measuring radon levels in all WDGPH offices as per the guidelines laid out in Health Canada's Guide for Radon Measurement in Public Buildings.¹¹ As per the guidelines, testing will occur over a three month period.

Conclusion

Indoor exposure to radon is the second leading cause of lung cancer in Canada, second only to smoking. Radon enters homes through the basement and can accumulate to high levels. The higher the radon level, and the longer a person is exposed, the greater their risk of developing lung cancer.

Based on testing completed by Health Canada, the Wellington-Dufferin-Guelph area seems to have more homes with radon levels above the Canadian guideline (200 Bq/m³), when compared with Ontario and Canada. In response to the Health Canada study, WDGPH, with support from partners, hosted public information sessions at which members of the public could learn more about radon and purchase a radon test kit. Over the course of four public information sessions hosted in 2015 and 2016, 507 members of the public attended and 310 test kits were sold.

In September 2015, the City of Guelph initiated a Radon Gas Mitigation Program that requires radon gas mitigation measures in new construction as per requirements in the Ontario Building Code that apply to areas where radon gases are known to be a problem. Meanwhile, the Ministry of Municipal Affairs has proposed updates to the Ontario Building Code that will include radon requirements during construction of all new buildings across Ontario.

Ontario Public Health Standard

Health Hazard Prevention and Management Standard

Goal

To prevent or reduce the burden of illness from health hazards in the physical environment.

Identified below are the outcomes and requirements in the Ontario Public Health Standards to which the current radon awareness campaign relates.

Societal Outcomes

- There is increased capacity on the part of the public and community partners to address the risk factors that reduce health hazard exposure and diseases.
- There is increased public engagement in practices and activities that reduce exposure to hazardous conditions and factors and protect the environment.

Board of Health Outcomes

- The public is aware of health protection and prevention activities related to health hazards and conditions that create healthy environments.

Requirements

3. The board of health shall increase public awareness of health risk factors associated with the following health hazards:

- Indoor air quality
- Exposure to radiation

These efforts shall include:

- Adapting and/or supplementing national and provincial health communications strategies; and/or
- Developing and implementing regional/local communications strategies.

WDGPH Strategic Direction(s)

Check all that apply:

Building Healthy Communities

We will work with communities to support the health and well-being of everyone.

Service Centred Approach

We are committed to providing excellent service to anyone interacting with Public Health.

Health Equity

We will provide programs and services that integrate health equity principles to reduce or eliminate health differences between population groups.

Organizational Capacity

We will improve our capacity to effectively deliver public health programs and services.

Health Equity

Radon is present in any home, therefore all homeowners are encouraged to test their home to see if the gas is at a level that requires remedial action. In 2015, Guelph was the only location where a session was held. To make the drop-in sessions accessible to more people in Wellington, Dufferin, and Guelph, 2016 sessions were also held in Orangeville and Fergus and in convenient locations (i.e. recreation centers). Considerations were also taken to support people to test their homes for radon: 1) tests were offered at a reduced cost of \$35 including tax (tests can range in price from \$40 to \$50+), and 2) experts were available to answer questions and concerns to help people make an informed decision about testing their home.

Appendices

None.

References

1. Government of Canada. Testing your home for radon [Internet]. 2015 October 10 [cited 2016 December 7]. Available from: [http://healthy Canad ians.gc.ca/security-securite/radiation/radon/home-test-maison-eng.php](http://healthy Canadians.gc.ca/security-securite/radiation/radon/home-test-maison-eng.php)
2. Peterson EP, Aker A, Kim J. Lung cancer risk from radon in Ontario, Canada: how many lung cancers can we prevent? *Cancer Causes Control* [Internet]. 2013 [cited 2016 Dec 9]; 24(11):2013-2020. Available from: <http://link.springer.com/article/10.1007/s10552-013-0278-x>
3. Health Canada. Radon – Reduction Guide for Canadians [Internet]. 2013. [cited 2015 Dec 7]. Available from: http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radon_canadians-canadiens/index-eng.php
4. Health Canada. Cross-Canada Survey of Radon Concentrations in Homes Final Report [Internet] 2012 [cited 2016 Dec 7]. Available from: <http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/survey-sondage-eng.php>
5. Wellington-Dufferin-Guelph Public Health. BOH report – BOH Report #05/10 Radon: Current Knowledge and Population Health Risks. 2010 March 3. [cited 2016 December 15].
6. Wellington-Dufferin-Guelph Public Health. BOH report – BH.01.FEB0613.R05 Radon: Recent Developments and Awareness Campaign Launch [Internet]. 2013 February 6. [cited 2016 December 15] Available from: [http://www.wdgpublichealth.ca/sites/default/files/wdgphfiles/BH.01.FEB0613.R05%20-%20Radon%20Recent%20Developments%20%26%20Awareness%20Campaign%20Launch%20\(with%20Attachments\).pdf](http://www.wdgpublichealth.ca/sites/default/files/wdgphfiles/BH.01.FEB0613.R05%20-%20Radon%20Recent%20Developments%20%26%20Awareness%20Campaign%20Launch%20(with%20Attachments).pdf)
7. City of Guelph. Radon Gas Mitigation Program [Internet]. 2016. [cited 2016 December 9] Available from: <http://guelph.ca/city-hall/building-permits-inspections/residential-building-permits/radon/>
8. Ontario Ministry of Municipal Affairs. Overview Summary – Potential Changes To Ontario's Building Code [Internet]. 2016. [cited 2016 Dec 7] Available from: <http://www.mah.gov.on.ca/Page14998.aspx#Next+Edition>
9. Ontario Ministry of Municipal Affairs and Ministry of Housing. Long-Term Affordable Housing Strategy Update – Proposals to Encourage Small Landlords to Provide Rental Housing [Internet]. 2016. [cited 2016 Dec 7] Available from: <http://www.mah.gov.on.ca/Page14998.aspx#Next+Edition>
10. Canadian Environmental Law Association. Challenging all MPs whose ridings have high radon levels – support a tax tax credit! [Internet]. Kathleen Cooper 2016 October 25 [cited 106 Dec 7] Available from: <http://www.cela.ca/blog/2016-10-25/challenging-all-mps-whose-ridings-have-high-radon-levels-support-radon-tax-credit>
11. Health Canada. Guide for Radon Measurement in Public Buildings [Internet]. 2016. [cited 2016 Dec 12] Available from: http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radon_building-edifices/index-eng.php