Indoor Radon Levels in Windsor-Essex County

Overview

Radon is a naturally occurring odourless and colourless gas that is produced by the radioactive decay of uranium. In outdoor air, radon is not harmful. However, radon can accumulate indoors to high concentrations and can pose a health risk (Health Canada, 2012). The Government of Canada Radon Guideline recommends that if the annual average indoor radon concentration in a home's normal occupancy area is greater than 200 Bq/m^3 then steps should be taken to decrease the radon level (Health Canada, 2007).

The Windsor-Essex County (WEC) Health Unit began a radon awareness campaign in late 2015. As a part of the campaign, participants who were owners of private detached homes were recruited to determine radon levels in participant homes and in the areas of WEC.

Average Indoor Radon Level in Windsor-Essex County

The average indoor radon level for WEC was found to be 99 Bq/m^3. When compared to the average level for WEC, the municipality of Amherstburg had significantly higher levels (150 Bq/m^3). The average levels for Essex, Kingsville, Lakeshore, LaSalle, Leamington, Tecumseh, and Windsor were not significantly different than that of WEC.

Percentage of Homes above the Canadian Guideline (≥200 Bq/m³)

Twelve percent of homes in WEC had radon levels above 200 Bq/m^3. However, Essex County had a significantly greater proportion of homes with levels above the Canadian guideline when compared to WEC. Twenty-two percent of homes in Essex County had levels above the Canadian guideline, whereas only seven percent of homes in Windsor were above this level.

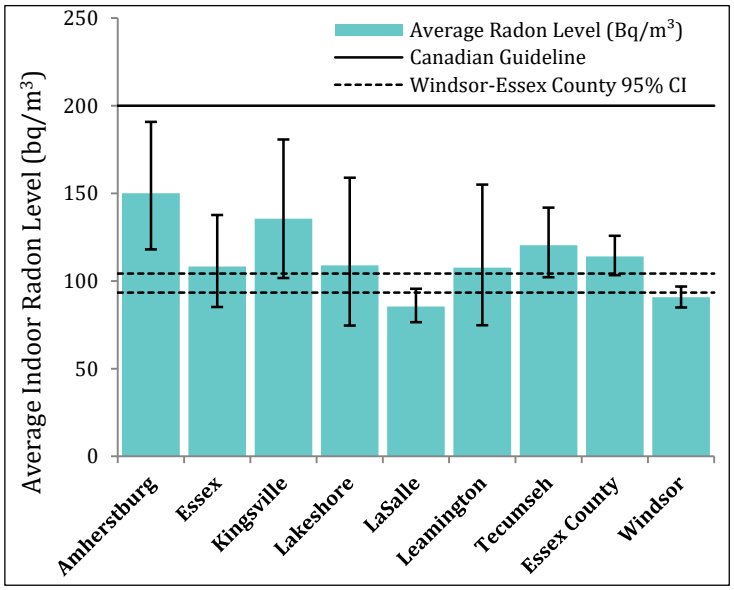

Figure 1. Average Indoor Radon Level (Bq/m^3) by Area

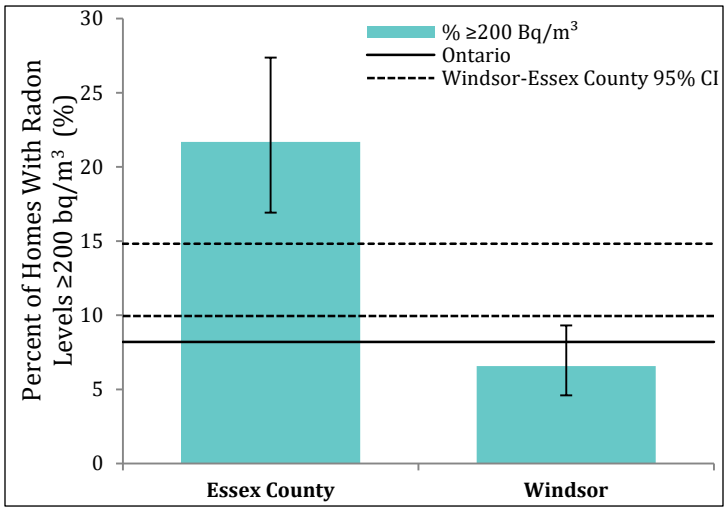

Figure 2. Percentage of Homes with Indoor Radon Levels ≥200 Bq/m^{3}by Area.

Table 1. Average Indoor Radon Level (Bq/m^3) and 95% Confidence Intervals by Area

Area	Average (Bq/m^3)	95% Confidence Interval (Bq/m^3)
Amherstburg	150.07	118.03 to 190.80
Essex	108.29	85.16 to 137.69
Kingsville	135.60	101.73 to 180.76
Lakeshore	108.88	74.59 to 158.95
LaSalle	85.50	76.50 to 95.56
Leamington	107.68	74.82 to 154.98
Tecumseh	120.41	102.19 to 141.87
Essex County	114.05	103.39 to 125.81
Windsor	90.72	84.93 to 96.89
Windsor-Essex County	98.70	93.42 to 104.28

Table 2. Percentage of Homes with Indoor Radon Levels ≥200 Bq/m^3 and 95% Confidence Intervals by Area

Area	% ≥200 Bq/m^3	95% Confidence Interval (%)
Essex County	21.69	16.92 to 27.37
Windsor	6.57	4.60 to 9.31
Windsor-Essex County	12.17	9.95 to 14.82
Ontario	8.2*	N/A

*The percentage for Ontario was obtained from the Cross-Canada Survey of Radon Concentrations in Homes – Final Report (Health Canada, 2012).

Data Notes

1. The estimates reported are based on radon test kit and geographic data obtained from 657 participants that met the study criteria and provided valid results.
2. An estimate was deemed to be significantly different than another estimate if the 95% Confidence Intervals for the two estimates did not overlap. The 95% Confidence Interval is the range within which we can be 95% certain that the true population estimate falls.
3. Geometric averages were calculated (rather than arithmetic averages) since indoor radon levels follow a lognormal distribution rather than a normal distribution (World Health Organization, 2009).
4. Participants were restricted to owners of private detached homes who were 18 years or older who did not plan on moving or undertaking major renovations in the six months after start of testing.
5. Participants were asked to conduct the test in the normal occupancy area of the lowest lived-in level of their home, for at least 91 days.
6. A stratified sampling strategy with proportionate allocation of test kits was undertaken to ensure regional representation. This was done by ensuring that the proportion of test kits distributed in a Forward Sortation Area (FSA) was proportional to the number of homes in that FSA to the total population.

References

1. Health Canada. (2007). *Government of Canada Radon Guideline.* Ottawa. Retrieved from http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/guidelines_lignes_directrice-eng.php
2. Health Canada. (2012). *Cross-Canada Survey of Radon Concentrations in Homes - Final Report.* Ottawa. Retrieved from http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/survey-sondage/index-eng.php
3. World Health Organization. (2009). *WHO handbook on indoor radon: a public health perspective.* Geneva. Retrieved from http://apps.who.int/iris/bitstream/10665/44149/1/9789241547673_eng.pdf