Cross-Canada Survey of Radon Concentrations in Homes – Data Description

Radon (Rn-222) contributes to approximately 50% of exposure from naturally occurring radioactivity for most Canadians, and is the second leading cause of lung cancer after tobacco smoking. Radon comes from the decay of naturally occurring uranium, and uranium is found naturally in rocks and soils all over the earth’s surface. It can easily move through small spaces in soils and other materials, allowing it to enter homes and accumulate to levels that can pose a health risk. Health Canada recommends that all Canadians test their home for radon and remediate if levels are higher than 200 becquerels per cubic metre (Bq/m3).

The National Radon Program (NRP) conducted a national survey from 2009-2011 to gather information on residential radon levels in Health Regions across Canada. Health Regions are administrative areas defined by Provinces or Territories where health services are delivered. Sampling was designed to collect data that was representative of all 124 Canadian Health Regions as they were delineated in 2007, which were the boundaries that were in effect when the survey was launched (http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVDPage1&TVD=53880&db=imdb&dis=2&adm=8). Due to the low populations in some Health Regions, a few were amalgamated: Burntwood (4680) and Churchill (4690) in Manitoba were combined to become Burntwood/Churchill (4685); and Mamawetan (4711), Keewatin (4712), and Athabasca (4713) in Saskatchewan were combined to become Mamawetan/Keewatin/Athabasca (4714). These Health Regions were amalgamated solely for use in this study and do not have any other bearing outside this study. The Health Region codes were generated based on what was available.

Although all 124 Health Regions were sampled, there are only 121 Health Region Codes listed.

A market research firm recruited homes for the study by telephone and followed-up with homeowners during the study. The recruitment was done using random digit dialing of telephone numbers within each Health Region. Homeowners were provided with long-term alpha track detectors and instructions to deploy the detectors using Health Canada’s guidance for radon measurement in homes (https://www.canada.ca/en/health-canada/services/publications/health-risks-safety/guide-radon-measurements-residential-dwellings.html). Analysis of the exposed detectors was performed in Health Canada’s National Radon Laboratory.

The data in the accompanying table is furnished from this study and represents 13,814 homes with known radon test durations of at least 30 days. Approximately 96.2% of the tests were at least 90 days in duration, and 99.8% of them were at least 60 days in duration.

The data from this study are reported at the forward sortation area (FSA) in order to protect the privacy of the study participants while still making the dataset as useful as possible for those accessing the data. The FSA is the first 3 characters of the postal code for each home. There are 247 records for which FSAs have been redacted for these reasons.

The SI unit for radioactive decay is the becquerel (Bq), and one becquerel corresponds to one radioactive disintegration per second. The SI units for reporting the concentration of radon in a volume of air are Bq/m3. The detection limit of the radon analysis system was roughly 15 Bq/m3. Any result below the detection limit is reported as <15 Bq/m3.

The results show a wide range of indoor radon concentrations and follow a log-normal distribution. This is consistent with radon concentrations generally found in large residential surveys. Nationwide, 6.9% of survey participants were found to have radon levels above Health Canada’s guideline of the 200 Bq/m3.

Listed below are some useful resource links:

1. About the survey: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/cross-canada-survey-radon-concentrations-homes-final-report-health-canada-2012.html
2. What Canadians should know about radon and how to protect themselves, as well as Health Canada’s National Radon Program: canada.ca/radon
3. Health Canada’s guideline for indoor radon levels:

https://www.canada.ca/en/health-canada/services/publications/health-risks-safety/guide-radon-measurements-residential-dwellings.html