Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

RADON IN HOMES

What is it?
What harm can it do?
What can be done about it?



What is radon?

Radon is a radioactive gas formed in the ground by the radioactive decay of uranium which is present in small quantities in all rocks and soils. You cannot smell it, see it or taste it and it can only be measured with special detectors.

Why is radon harmful?

Radon can cause lung cancer and is in the same group of carcinogens as asbestos and tobacco smoke. In the air, radon decays quickly to produce radioactive particles that, when inhaled, are deposited in the airways and on lung tissue to give a radiation dose that can cause lung cancer. Radon is not linked to other types of respiratory illnesses or other types of cancer.

What are the risks from radon?

Approximately 350 lung cancer cases in Ireland every year can be linked to radon. Of these, over 90% will be observed in active and ex-smokers. The risk from radon is 25 times greater for active smokers than for lifelong non-smokers exposed to the same concentrations of radon. This is in addition to the lung cancer risk due to smoking itself. Ex-smokers remain at increased risk from radon for a number of years after they have stopped smoking.

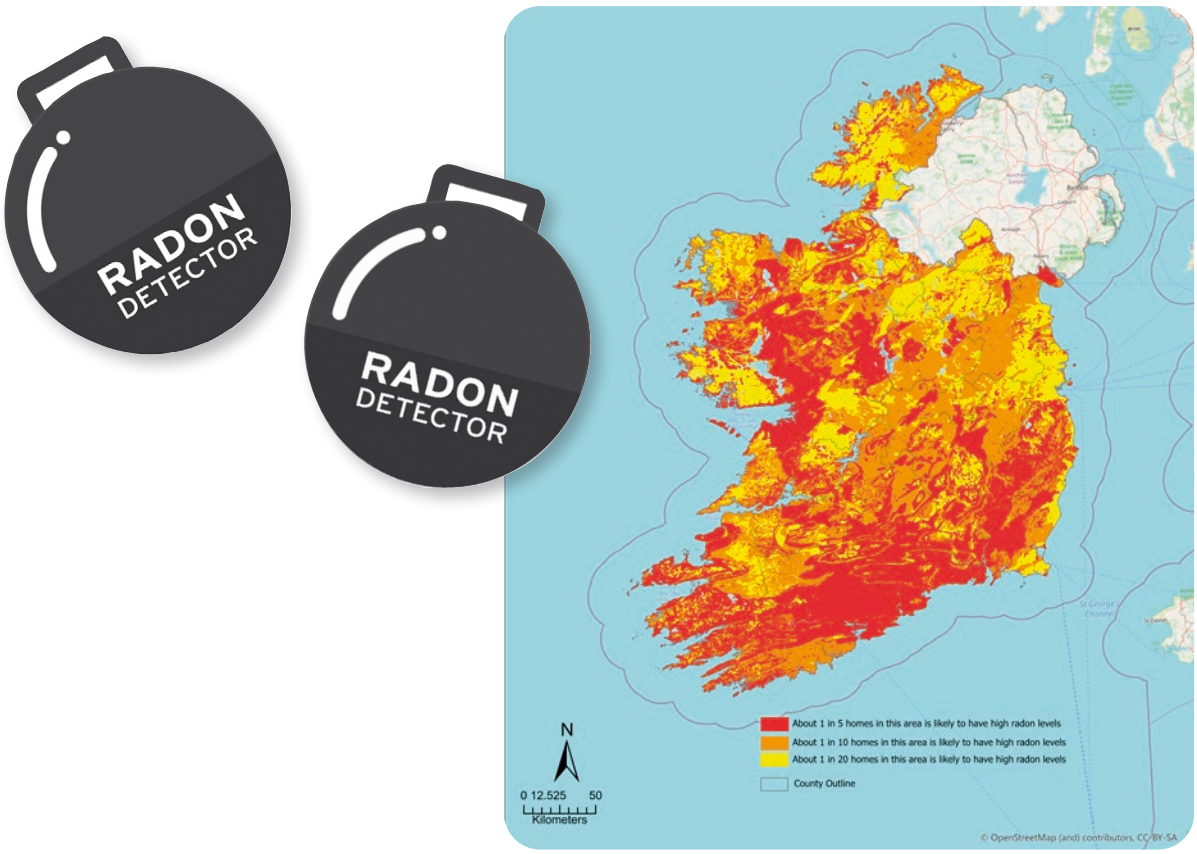
Are some areas in Ireland more at risk from radon than others?

Yes. Areas where more then 10% of homes are predicted to have radon concentrations above the Reference Level are designated as High Radon Areas. Maps showing high radon areas are available on the EPAs website **www.radon.ie.** Typing in your address or eircode will tell you if you are in a high radon area.

Radon Risk Map of Ireland

Approximately one-third of the country, mainly in the south and west, is designated as a High Radon Area.

While homes with high radon concentrations are more likely to be found in High Radon Areas, high radon concentrations can be found in any part of the country.



How do I check the radon concentrations in my home?

The Environmental Protection Agency (EPA) provides a list of registered radon measurement services on **www.radon.ie**. Measurement usually involves posting two small detectors, similar to those shown in the photograph, to your home. One is placed in a bedroom and the other in a living room. Indoor radon concentrations can vary considerably from day to day due to changes in weather conditions, ventilation rates, etc. and for this reason the measurement period should not be less than three months. The detectors are returned for analysis at the end of the measurement period and following analysis, the results and recommendations are sent to you by post or email.

At what radon concentration should action be considered?

Radon concentration is measured in becquerels per cubic metre of air (Bq/m^3). The becquerel is a unit of radioactivity and corresponds to one radioactive disintegration per second.

The **Reference Level** for long-term exposure to radon in homes, above which the need for remedial action should be considered, is **200 Bq/m^3**. The Reference Level should not be regarded as a rigid boundary between safety and danger but rather as a guideline as to when one should consider taking action to reduce the radon concentration.

The EPA recommends that long-term exposure to radon concentrations above the Reference Level should be avoided.

What can be done to reduce high radon concentrations in a home?

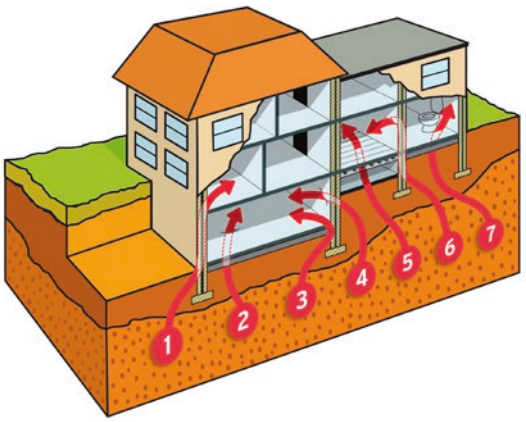
Radon problems in a home can be fixed easily, relatively inexpensively and usually without disruption to the household. A booklet entitled **Understanding Radon Remediation – A Householder's Guide** which will help you learn more about the solutions available and how best to deal with the problem, has been published by the EPA and is available from its website – **www.radon.ie.** In addition, the EPA holds a list of registered companies who provide a radon remediation service and this is also available on the website or on **www.radon.ie.**

Technical guidance on radon remediation techniques is available from the Department of Housing, Planning and Local Government and in a booklet entitled Radon in Existing Buildings – Corrective Options. This booklet is available from the "Building Standards" section of the Department's website **www.housing.gov.ie.**

How does radon get into homes?

Because it is a gas, radon can move through the soil allowing it to enter buildings – mainly through cracks in floors or gaps around pipes or cables – where it can sometimes build up to harmful concentrations. Radon which surfaces outdoors quickly dilutes to harmless concentrations. Minor amounts may also come from building materials and from domestic water supplies. After any remediation work a repeat radon measurement should be carried out to check that the radon levels have been reduced. You can contact the EPA directly to avail of this test free of charge.

Typical Entry Routes into a Dwelling



1. Cavities in walls
2. Cracks in solid floors
3. Construction joints
4. Cracks in walls below ground level
5. Gaps in suspended floors
6. Cracks in walls
7. Gaps around service pipes

Should radon be measured in new homes in which radon preventive measures were installed at the time of construction?

Yes. The installation of radon preventive measures is not a guarantee that radon concentrations will be below the Reference level of 200 Bq/m^3. The EPA recommends that radon concentrations are measured once the home is occupied.

Specific guidance on radon prevention measures for new homes is contained in **"Building Regulation 1997, Technical Guidance Document C – site preparation and resistance to moisture"** which is published by the Department of Housing, Local Government and Heritage and is available at **www.gov.ie.** This guidance specifies that all homes built since July 1st 1998 must be fitted with a standby radon sump which can be activated at a later stage, to reduce any high radon concentrations subsequently found. For homes built in High Radon Areas, the installation of a radon barrier as well as a standby radon sump is required.

Are high radon concentrations found in buildings other than homes?

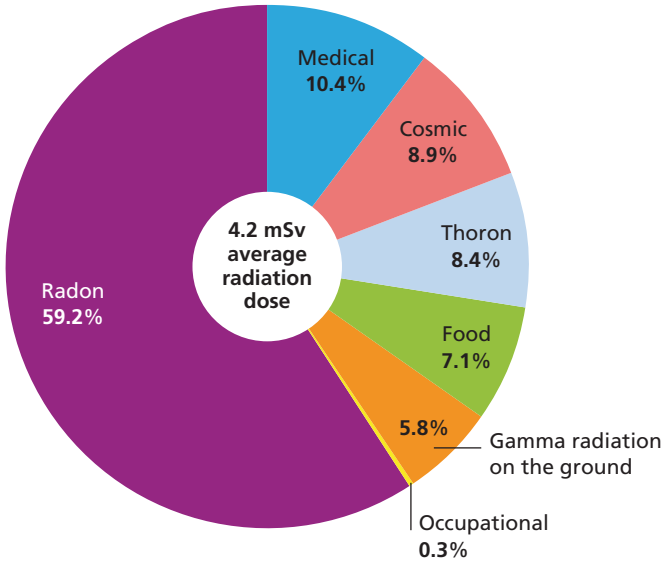
Yes. High radon concentrations can be found in all types of buildings, including workplaces. By law, all indoor workplaces in High Radon Areas **must** have radon measurements carried out and a Reference Level for radon concentrations in workplaces is set out in legislation. Further information on radon in the workplace can be found on the EPA's website **www.radon.ie.**

How does radon compare with other radiation sources in Ireland?

Radon contributes almost 60% of the radiation dose received by the average person in Ireland. Most of the remainder comes from other forms of natural radioactivity such as cosmic radiation from the sun and outer space.

Artificial sources, of which medical exposures are the largest, contribute about 10% of the total dose. Emissions from civil nuclear installations abroad give rise to less than 1% of our radiation dose.

The EPA advises all householders, particularly those living in High Radon Areas, to measure radon. Measurement is the only way of knowing if high radon concentrations are present in your home.



Average radiation doses to the Irish population

Our Purpose

To protect, improve and restore our environment through regulation, scientific knowledge and working with others.

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September 2026