Radon Gas in Ireland

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• What is radon?
• Why is radon of concern?
• The national radon survey
• How do levels compare internationally?
• How do we deal with radon in houses?
What is radon?

• Naturally occurring radioactive gas, which is produced in rocks and soils everywhere.

• Because it is a gas it can seep up through the ground into the atmosphere.

• If radon enters the atmosphere in an enclosed space such as a building, it can accumulate.

• High radon levels give rise to a significant risk to health.
Why is radon of concern

- Greatest cause of lung cancer after smoking. It accounts for approximately 10% to 15% of lung cancers in Ireland.
- Largest source of radiation exposure to the general population.
- Source of radiation which is amenable to control – high radon is not a risk we have to live with.
The national Reference Level

- In 1990 the Government introduced a national Reference Level for radon in homes of 200 Bq/m³.
- The Reference Level is a guideline level at which one should consider taking action.
- Keep exposure as low as reasonably achievable – we can reduce radon exposure but can not eliminate it.
National Radon Survey


- For each 10 km grid square the percentage of houses above 200 Bq/m$^3$ is predicted.

- Squares with > 10% are designated High Radon Areas

- 7% of houses predicted to be above Reference Level
Individual county maps are available on the RPII’s website.
How do we know if a house has a radon problem

• National Radon Survey gives us the probability that a house in a given area will have a radon problem.

• Radon levels in individual houses depend on many factors so that within any grid square there may be great variability.

• The only way to know if an individual house has a problem is to measure it.
How do levels compare internationally

Mean Radon concentrations per Country (WHO)
How do levels compare internationally

Highest concentration detected per country
Radon levels in Ireland

- Radon concentrations in Irish houses range from 10 to 50,000 Bq/m$^3$ (Average = 91 Bq/m$^3$).
- Approximately 100,000 houses (7% of national stock) are estimated to exceed the national Reference Level (to date approximately 4% of those houses have been identified).
- Based on countries, which have published radon data, Ireland is at the upper end of the range.
Testing a house for radon

- Simple and inexpensive.
- Because of variability it is necessary to measure over 3 months.
- One detector is placed in the main living area and one in the main bedroom.
- Can be done entirely by post.
What are the factors influencing radon concentrations in a building

- **Radon is produced in the ground**: Influenced by geology and soil characteristics.

- **Entry into building**: Influenced by building type, location, cracks or gaps in foundation, etc. Remediation normally focused at this level.

- **Retention and accumulation in building**: Influenced by occupancy, ventilation, heating, etc. Remediation sometimes focused at this level.
Dealing with radon (existing houses)

• The only way to know if an individual house has a problem is to measure it.
• If a radon problem exists then a range of effective and cost effective remediation measures are available.
• Buildings should always be tested after remediation.
Dealing with radon (new houses)

- Radon prevention should be included at the stage of construction (Building Regulations). The level of protection required is greater in High Radon Areas.
- All new houses should be measured once occupied.
- If found to be high then sump (required in all houses) should be activated.
Conclusions

• The radon problem in Ireland is at the upper end of the international range.

• Radon is amenable to control – the health risk from radon can be limited through effective management.

• The only way to know if a house has a problem is to measure it. Currently more than 95% of houses with high radon concentrations have yet to be identified.