

Building Control and Radon

Stephanie Long
6th April 2011



Radiological Protection Institute of Ireland

An Institiúid Éireannach um Chosaint Raideolaíoch

What am I going to talk about?

- What is radon and why is it a problem?
- How big is the problem in Ireland?
- What have we achieved to date?
- What is not working?
- What is our vision?
- What impact have the Building Regulations had on radon in Ireland?
- What does the data tell us?
- Where do we go from here?

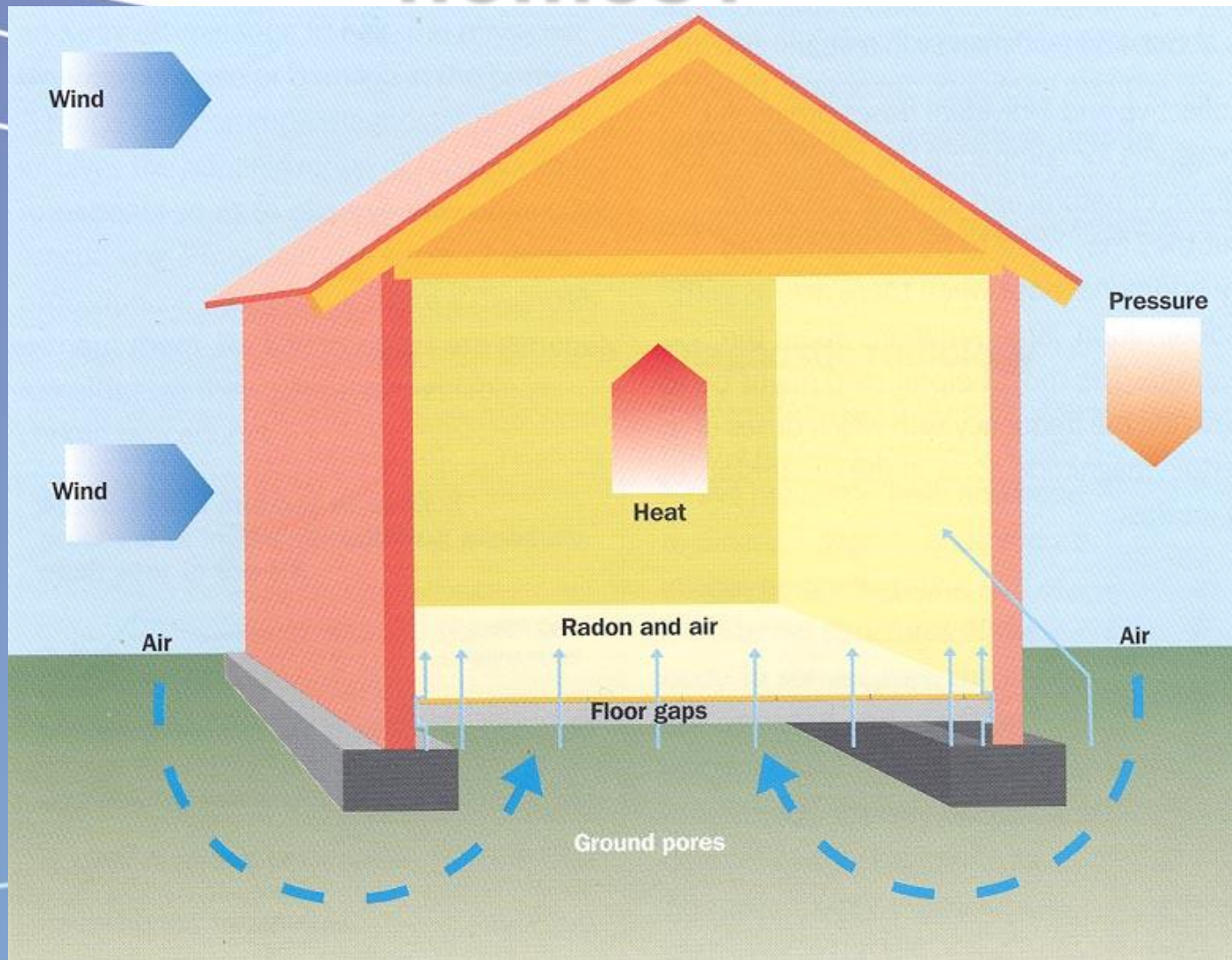


What is Radon?

- Colourless, odourless, tasteless, radioactive gas
- Comes from uranium which is present in tiny quantities in all rocks and soil
- Radon is everywhere – outdoors radon is not a problem
- Can enter buildings from the ground through cracks and gaps and can build up to very high levels
- Known to be a problem since the 16th Century for miners
- Known to be a problem in homes since the 1980s

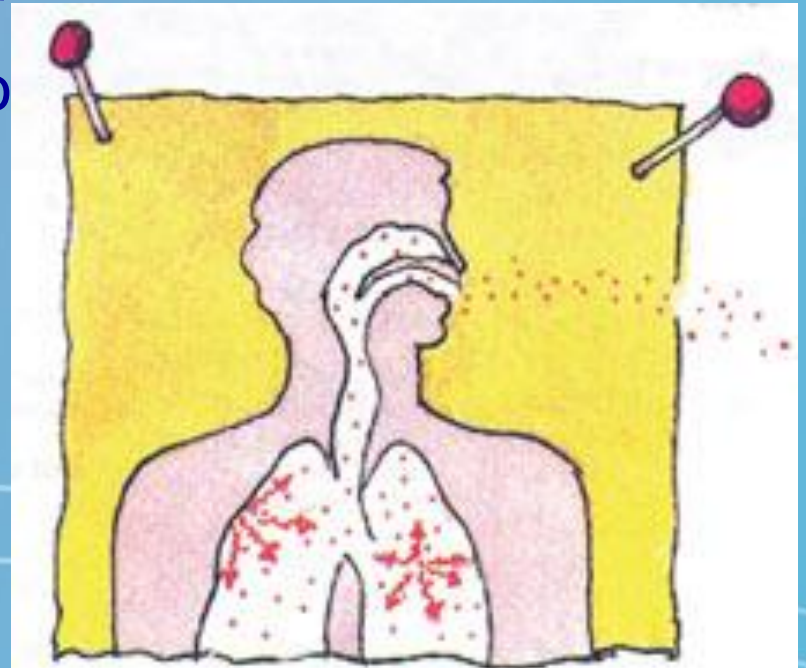


How does radon build up in homes?

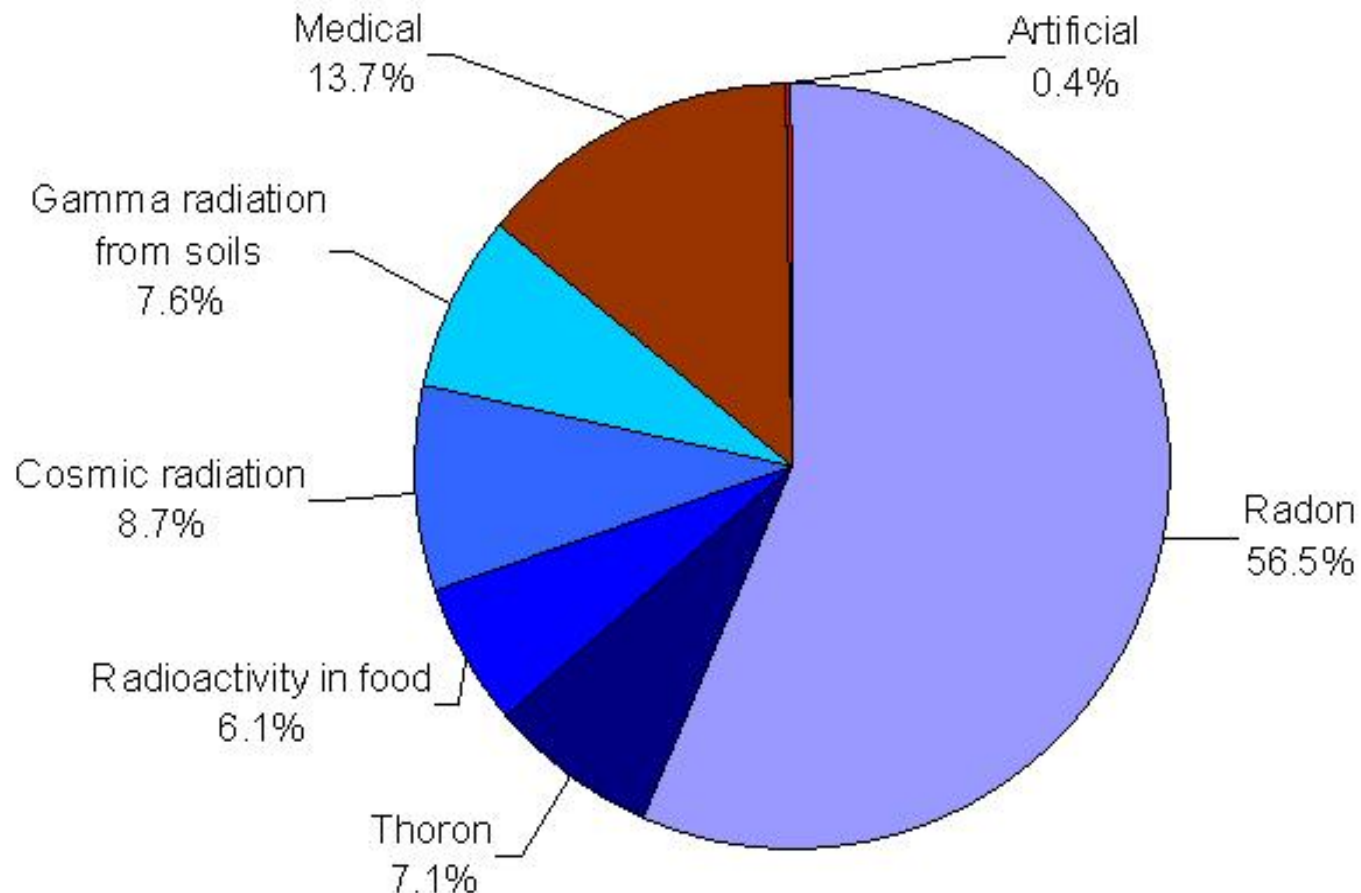


Why is radon a problem?

- Group 1 carcinogen - same as tobacco smoke and asbestos (WHO)
- Forms particles that can lodge in the lung resulting in a radioactive dose
- 150-200 deaths annually (10-15%)
- 2nd cause of lung cancer after smo
- Risk 25 times greater for smokers
- 56% of total dose to average Irish

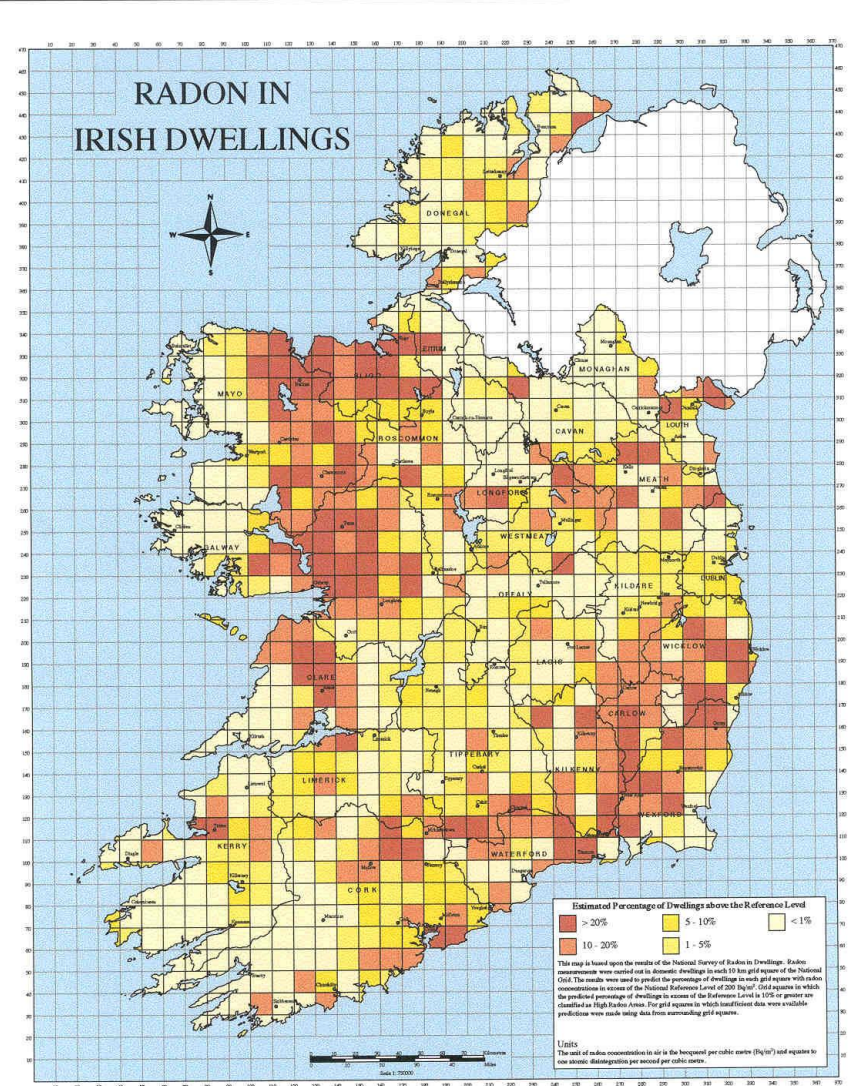


Distribution of Radiation Doses in Ireland



What is the scale of the problem in Ireland?

- 11,319 homes measured 1992-1999
- Percentage of homes above **200 Bq/m³** predicted for each 10 km grid square
- Squares predicted to be above 10% are designated High Radon Areas



Radiological Protection Institute of Ireland
An Institiúid Éireannach um Chosaint Radaiolaíoch

Based on the Ordnance Survey's reproduction of the Ordnance Survey (Great Britain) 1:250,000
© Ordnance Survey, 2000. © Radiological Protection Institute of Ireland
1 Clonsilla Square, Clonsilla Road, Dublin 14, Tel: (01) 2097910

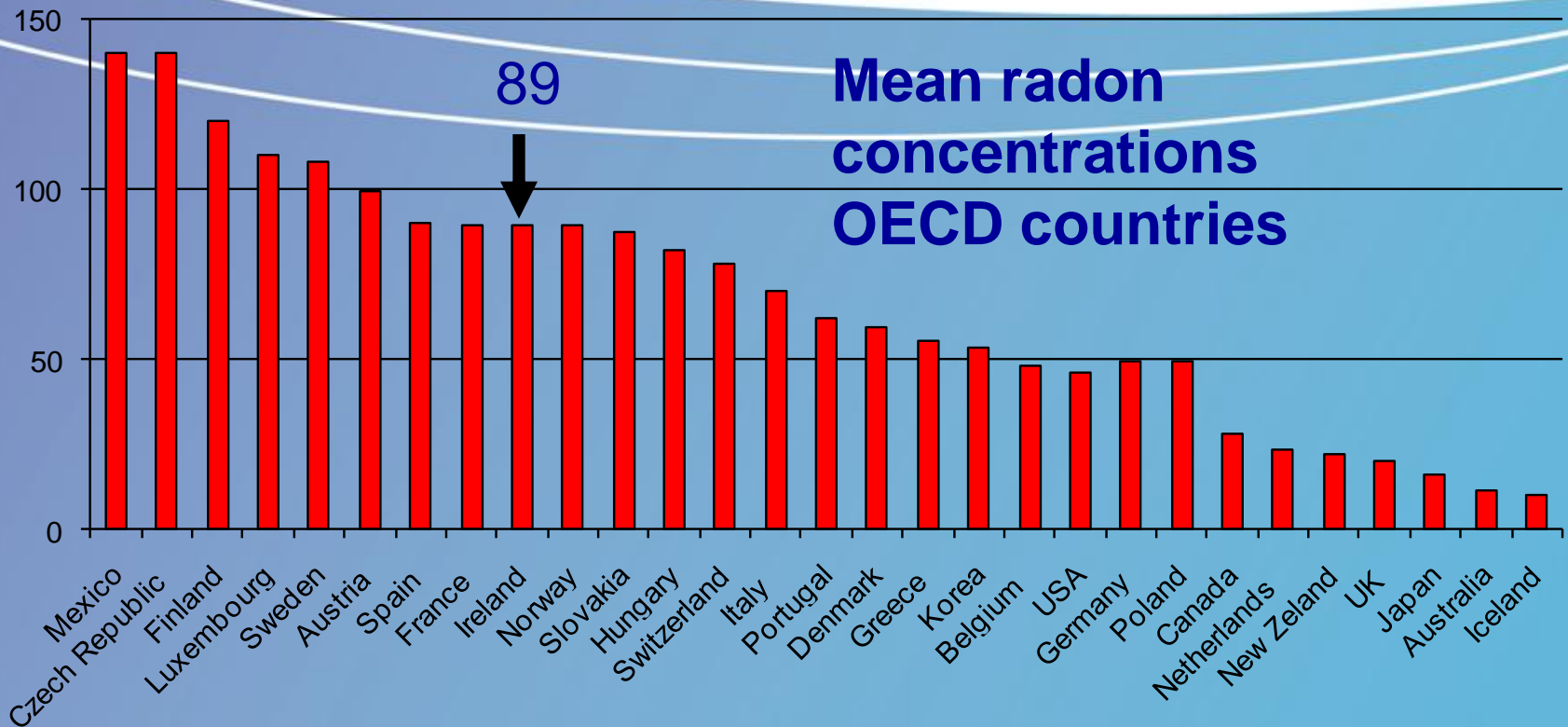
Further Information:

Information regarding radon in homes is available in a booklet entitled *Radon in Irish Dwellings* published by the Department of the Environment. This booklet can be purchased from the Government Publications Sale Office, Midwestworth Street, Dublin 2.

Detailed descriptions of the surveys on which this map is based have been published in the RPII reports: *Radon in Dwellings - the National Radon Survey: Carlow, Donegal, Fife, Wick, Roscommon, Monaghan and Sligo*; *Radon in Dwellings - the National Radon Survey: Clare, Donegal, Fife, Wick, Roscommon, Monaghan, Sligo, Wick, Roscommon, Monaghan, Sligo, Wick, Roscommon, Monaghan, Sligo*; *Radon in Dwellings - the National Radon Survey: Clare and Kerry* (SI 1991); *Radon in Dwellings - the National Radon Survey: Clare, Louth and Tipperary* (SI 1992); *Radon in Dwellings - the National Radon Survey: Clare and Sligo* (SI 1993). These reports are available on the Institute's website (www.rpii.ie).

Map prepared by
© Ordnance Survey
Map data © Ordnance Survey
Map data © Ordnance Survey
Map data © Ordnance Survey

How do levels compare internationally (WHO 2009)?



Worldwide average 39 Bq/m³



Radiological Protection Institute of Ireland

An Institiúid Éireannach um Chosaint Raideolaíoch

Results to date

- Almost 45,000 home measurements (RP11)
- National Radon Survey estimated 91,000 homes above 200 Bq/m³
- So far about 5,500 homes above 200 Bq/m³ have been identified
- Leaving 85,500 unidentified homes with a radon problem



What have we achieved to date?

- The National Radon Survey quantified problem since 1997
- Radon addressed in Building Regulations since 1998
- All school tested and remediated
- Significant progress made on testing and remediation of social housing
- Significant public awareness efforts resulting in a growing public awareness
- Progress on including radon in workplace H&S framework
- Large body of guidance documents, research, etc
- Widespread acknowledgement of the problem among key stakeholders (RPPII, DEHLG, HSE, HSA, Local Authorities)



What has not happened?

- Testing rates for private housing remain stubbornly low (< 5% problem houses identified)
- Remediation rates for private houses also low (\approx 10 - 20% of identified houses)
- While public awareness of radon is high understanding of the issues is low
- While radon prevention in new build has reduced radon levels, more remains to be done
- Policy on radon not perceived to be Government led



What is our vision?

1. Radon prevention well integrated into mainstream building practice and all houses tested post construction
2. Exchange of information on radon testing happens routinely during conveyancing
3. Clear requirements in place for rental sector
4. Radon integrated into workplace Health and Safety framework
5. Information on radon available to general public



Impact of Building Regulations

Radon in all homes in North Cork High Radon Areas

Survey	Homes measured	Geometric mean Bq/m ³	Arithmetic mean Bq/m ³	Maximum Bq/m ³	No homes >200 Bq/m ³ (%)
Post Regs (1999-07)	101	116	158	743	19 (19%)
Pre Regs (1980-1998)	143	146	306	2133	50 (35%)



Impact of Building Regulations

Radon in a 10 km grid square (near Mitchelstown)

Survey	Homes measured	Geometric mean Bq/m ³	Arithmetic mean Bq/m ³	Maximum Bq/m ³	No homes >200 Bq/m ³ (%)
Post Regs (1999-07)	36	186	223	537	14 (39%)
Pre Regs (1980-1998)	38	614	739	2133	35 (92%)



Impact of Building Regulations

Radon in homes in Tralee (private homes)

Survey	Homes measured	Geometric mean Bq/m ³	Arithmetic mean Bq/m ³	Maximum Bq/m ³	No homes >200 Bq/m ³ (%)
Post Regs (1999-00)	43	68	144	1,326	9 (21%)
Pre Regs (1992-97)	29	126	261	926	13 (45%)



What does this (and international) data tell us?

- Prevention is effective – typically 50% reduction and there is evidence that this can be improved
- Comparable to international data (UK, EU)
- Understanding of building regulations (purpose of standby sump) is generally low in Ireland
- As prevention becomes mainstream cost ↓ and effectiveness ↑
- Prevention generally cost effective



Possible Actions

1. Review current policy regarding where radon barriers should be installed (high radon areas or everywhere)
2. Better guidance on radon prevention in new homes
3. Incorporation of workshops for local builders into RPII radon campaigns



What next?

- Work towards establishment of an appropriately constituted group tasked with driving the development of a National Strategy on radon control in Ireland

