

World Health Organization's International Radon Project

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World Health
Organization

**WHO HANDBOOK
ON INDOOR RADON**
A PUBLIC HEALTH PERSPECTIVE



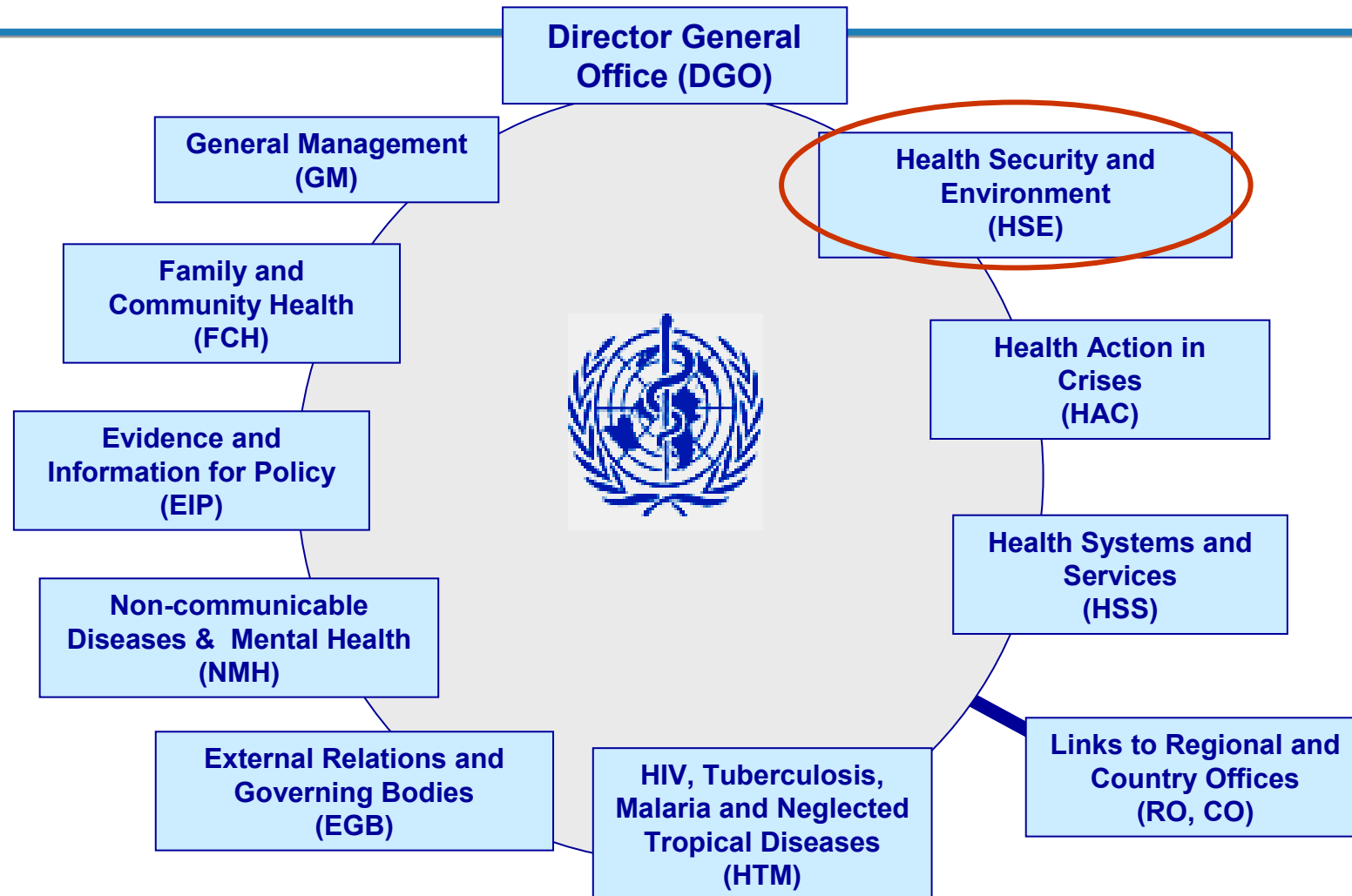
Sixth Irish National Radon Forum
6th November 2008 , Dublin

Structure

- **Introduction**
- **Health Effects of Radon**
- **Radon Measurements**
- **Prevention and Mitigation**
- **Cost-Effectiveness**
- **Radon Risk Communication**
- **National Radon Programmes**



Structure of WHO HQ



WHO and Radiation

CLUSTER	Health Security and Environment (HSE)			
	DEPARTMENT	Public Health and Environment (PHE)		
		UNIT	Interventions for Healthy Environments (IHE)	
			PROGRAMME	Radiation (RAD)
				



Radon – why is WHO involved ?

- **Scientific evidence suggests 3-14% of lung cancers are due to exposure to indoor radon (2nd after smoking)**
 - Globally > 70,000 cases (up to 170,000 cases) annually
 - direct evidence from case-control studies on indoor radon
- **Prevention & Mitigation are "relatively" easy**
- **Help to raise awareness among the public and politicians and bring together many countries for joint international approach to reduce radon health effects**
- **Radon is a Public Health issue**



WHO International Radon Project



- **Scope:**

A global project, with key international and national partners

- **Purpose:**

To reduce the population disease burden due to indoor radon

- **Funding:**

USA, UK, Switzerland, Germany and Ireland

- **Time frame:**

2005 – 2008



WHO-IRP Members



- Albania
- Argentina
- Austria
- Belgium
- Brazil
- Bulgaria
- Canada
- China
- Czech Republic
- Finland
- France
- Georgia
- Germany
- Greece
- Hungary
- India
- Ireland
- Italy
- Japan
- Lithuania
- Luxembourg
- Norway
- Poland
- Romania
- Russian Federation
- Serbia
- Slovenia
- South Korea
- Spain
- Sweden
- Switzerland
- Turkey
- USA
- Ukraine
- United Kingdom



Collaborations and Interface



- **EC**
 - Joint research centre JRC ISPRA
 - Radon surveys in Europe

- **IAEA**
 - Safety Guide on protection of the public from natural sources of radiation

- **UNSCEAR**
 - Report on radon exposures

- **OECD/NEA**
 - Cooperation in the CRPPH

- **National radon activities and institutions**
 - National radon events and meetings



WHO-IRP: Objectives



- **Identify effective strategies** for reducing the health impact of radon
- **Promote sound policy options**, prevention and mitigation programmes (incl. monitoring & evaluation of programmes)
- **Raise public, political and economical awareness** about the consequences of exposure to radon (incl. real estates and banks as target group)
- **Estimate the global health impact** of exposure to residential radon using available data on radon worldwide



WHO International Radon Project



- Annual meetings 2005- 2007, editorial meetings Dec. 2007 and July 2008
- Working groups
 - Risk assessment (Sarah Darby, Jan Zielinski)
 - Measurement (Bill Field)
 - Prevention and Mitigation (Bill Angell)
 - Cost-effectiveness (Alastair Gray, Terje Strand)
 - Risk communication (James McLaughlin)
 - National Radon Programmes (David Fenton, Francesco Bochicchio)
- Use WHO communication channels to promote radon awareness
- Forum for international scientific and policy exchange
- Develop WHO radon guidelines/publications

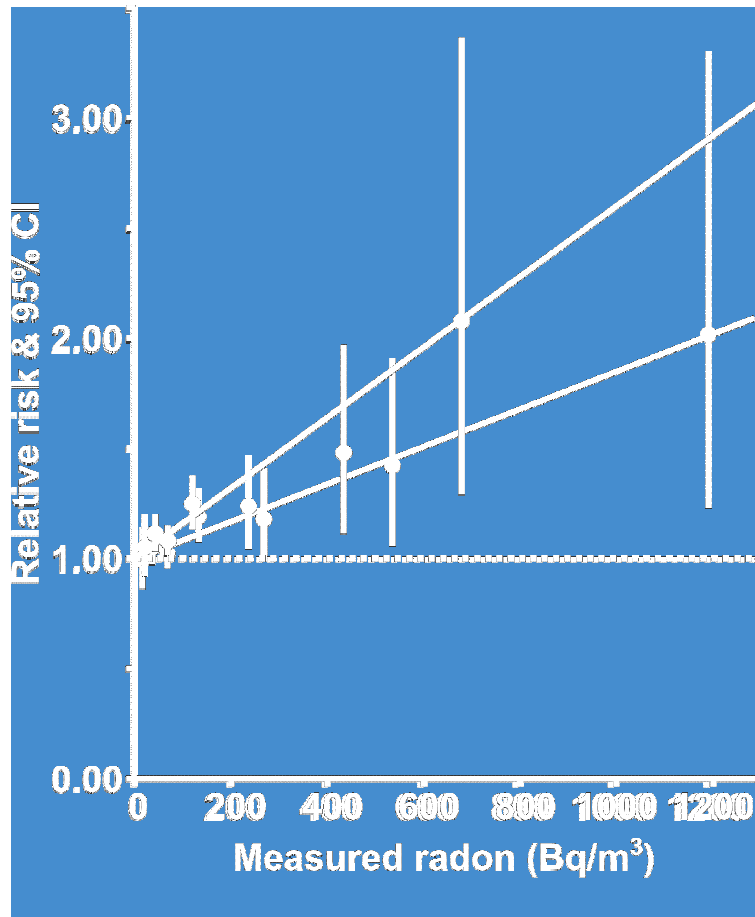


Health risks from radon

- **Environmental / occupational exposures**
 - Observation of frequent lung cancer in mine workers
 - First indoor air radon measurement reported in 1902
- **Initial epidemiological evidence from miners' studies**
 - Principal health risk: lung cancer
 - Also studied: leukemia and other health effects
- **Usual indoor exposures much lower, but: more people affected**
 - Dedicated indoor studies in Europe, North America, China, other countries
 - Overall consistent risk estimates



Health risks from radon



- Lung cancer risk increased by **8.4 % per 100 Bq/m³** increase in measured radon concentration

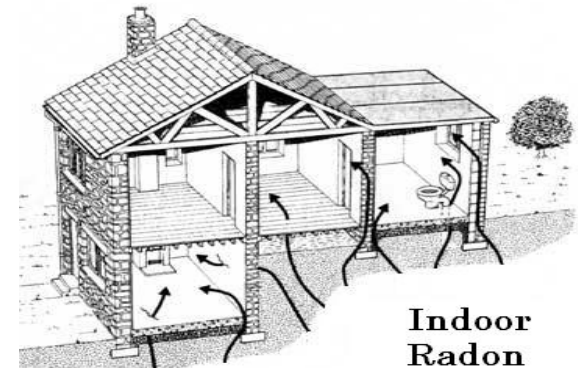
With measurements corrections:

- Lung cancer risk increased by **16 % per 100 Bq/m³** increase in measured radon concentration

Darby et al 2005

Measurement, Mitigation and Prevention

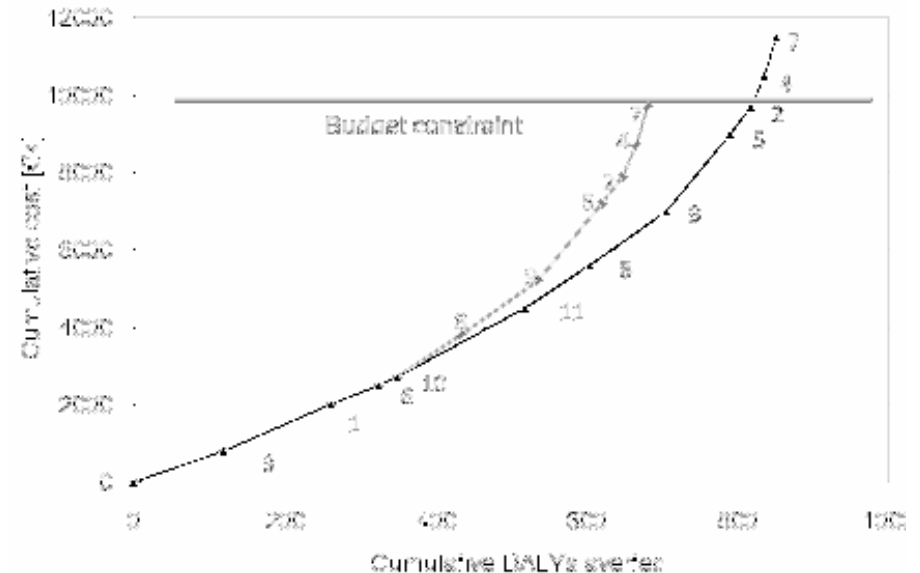
- Make use of the extensive experience in some countries to the benefit of all
- Provide an authoritative assessment of measurement and mitigation approaches
 - Overview of techniques used worldwide
- Provide policy options for national authorities that lead to a reduction in exposure to radon through prevention



Economic evaluation

- **Cost - benefit assessment of different strategies**

- Provide an evidence base for sound decision - making in the prevailing socioeconomic environment



- **A specific cost-effectiveness study for UK**

- Model for other countries

Advocacy and Risk Communication

- **Targeted communication activities**
 - What works in radon risk communication?
- **Creative ways of raising awareness about radon and extending WHO support to national programmes?**
 - Especially to countries that are just starting to develop radon programmes
- **Fact sheets, press releases, scientific reports etc. to raise public and political awareness about radon and health**





WORLD HEALTH ORGANIZATION
FACT SHEET

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Fact Sheet WHO/291
June 2005

RADON AND CANCER

Radon is a chemically inert, naturally occurring radioactive gas without odour, colour or taste. It is produced from radium in the decay chain of uranium, an element found in varying amounts in all rocks and soil all over the world. Radon gas escapes easily from the ground into the air and disintegrates through short-lived decay products called radon daughters or radon progeny. The short-lived progeny, which decay emitting heavily ionizing radiation called alpha particles, can be electrically charged and attach to aerosols, dust and other particles in the air we breathe. As a result, radon progeny may be deposited on the cells lining the airways where the alpha particles can damage the DNA and potentially cause lung cancer.

When radon gas itself is inhaled, most is exhaled and its progeny may be transferred but the corresponding doses and associated cancer risk.

Due to dilution in the air, outdoor radon in drinking water, the concentration depends on a hazard. Radon levels are higher indoors, places such as mines, caves and water for example, miners. However, the lower concentrations to which large populations are exposed – greatest exposure to radon comes in the home.

Radon in homes
The concentration of radon in a home depends on underlying rocks and soils, the routes of exchange between indoor and outdoor air, cracks at concrete floor-wall junctions, gas through sumps and drains. Consequently, other structural areas in contact with soil.

Exchange of indoor air with the outside, habits of the inhabitants, and sealing of adjacent to each other can be very different time of the year, from day to day and from the annual mean concentration of radon radon concentrations for at least three measurements give only limited information.

Zurück Vor Neu laden Stopp

http://www.who.int/ionizing_radiation/env/radon/en/index.html

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How does the project work?
IRP working groups:

- Risk Assessment
- WHO Exposure Guidelines
- Cost Effectiveness
- Measurement and Mitigation
- Risk Communication
- Coordination and Evaluation

Network and working group meetings
Production of Radon-related databases, reports and recommendations
Project coordination through WHO

Time to act
The largest contribution to environmental radiation in many countries comes from radon

The science is clear: the dangers of

Membership is open to any WHO member state government, i. e. department of health, or representatives of other national institutions concerned with radiation research and protection.

A global project to increase awareness on **radon** and health support action to decrease **radon** levels in homes



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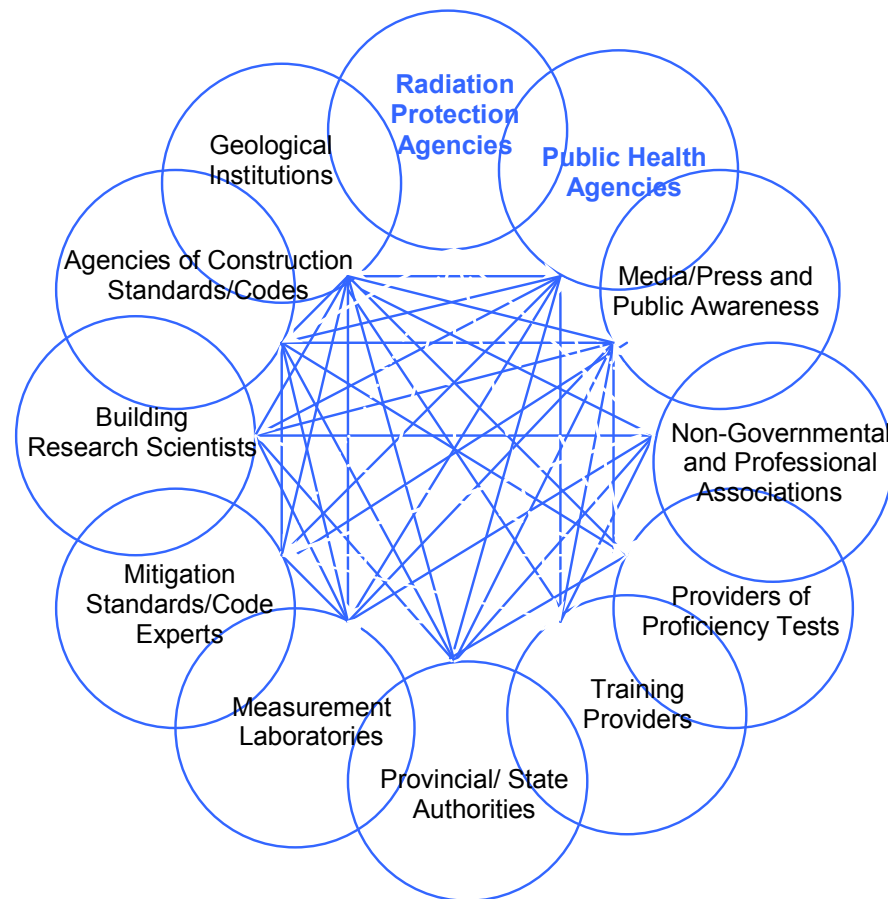


Guidelines: National Radon Programmes

- How to conduct national radon surveys
 - Trying to get a representative overview of radon in a country, not only from (alleged) high-radon areas
- How to link with anti-smoking programmes
 - Smoking / radon co-action
- Role of building regulations
 - New buildings offer unique chance for radon-proof building
- Importance of Reference Levels
 - Wide international variation, with most countries using levels between 200 and 400 Bq/m³



Organization National Radon Programme



WHO-IRP Next Steps

- **Radon Handbook still needs internal approval (Nov.) because it is a "Guidelines"**
- **Professional Editing finished (Layout still needed)**
- **Printing and distribution End 2008**
- **Launching in January 2009 (radon month)**
- **Mid 2009 annual workshop on a radon topic in the framework of the International Radon Project**



Thank you for your attention

"There is no known threshold below which radon exposure carries no risk. However, the lower the radon concentration in your home the lower is your risk. "

