World Health Organisation
International Radon Project
An Overview

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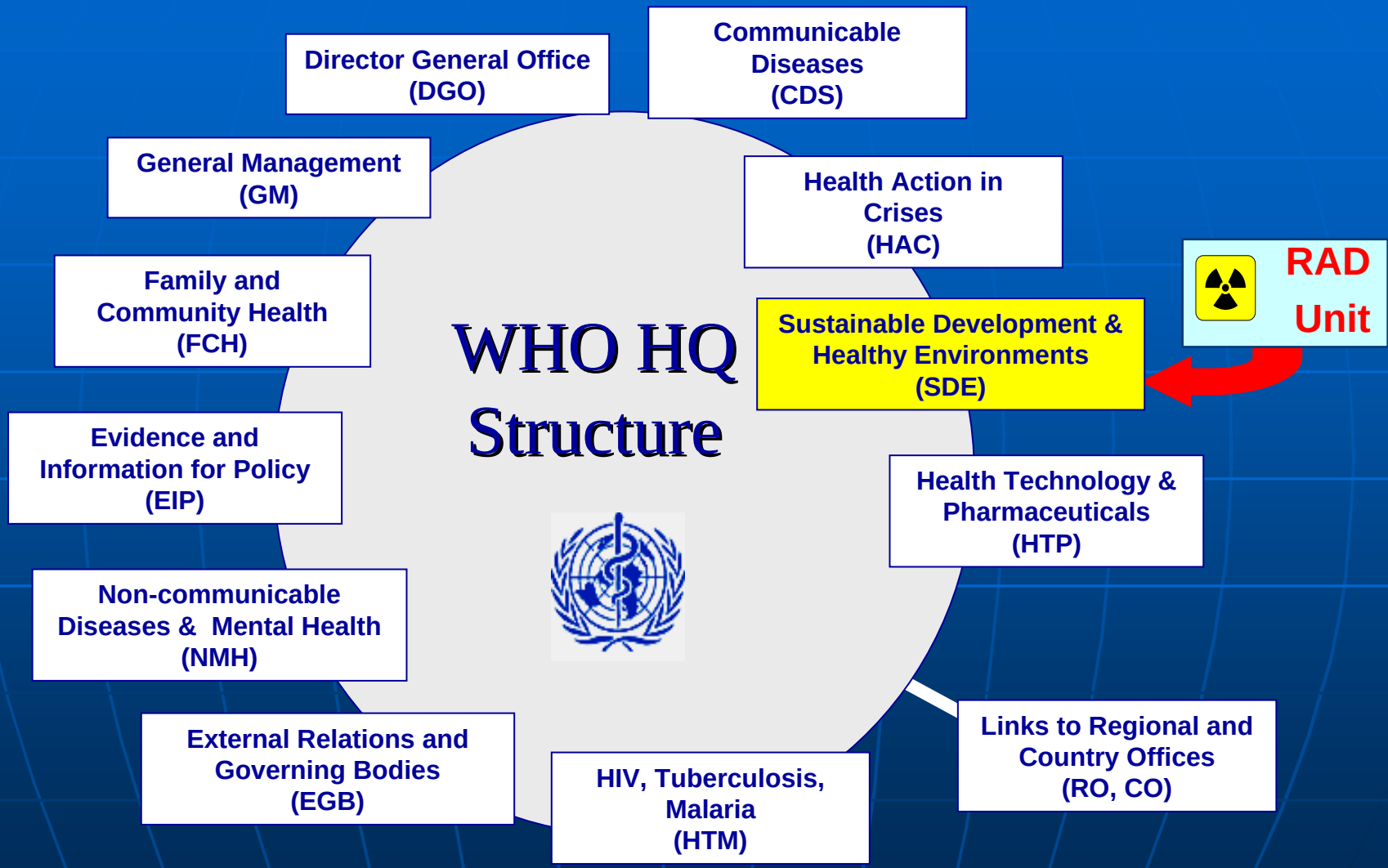


RAD Mandate

- Develop and promote evidence-based policy for Member States that protect health and reduce risks from exposure to radiation
- Provide medical support and public health advice in case of major radiation accidents or terrorist events
- Build capacity and provide information to support national programs in the field of radiation

Ionizing Radiation Risk Factors by Origin

- **Natural background radiation**
  - **Radon in homes**
  - Elevated background radiation areas (e.g. India, Iran, Brazil, etc)
- **Medical applications**
  - Diagnostic - X-rays, CT
- **Radioactive pollution**
  - Chernobyl and other accidents
  - Nuclear fallout and waste disposal
  - Depleted uranium
- **Occupational exposure**
  - Medical, nuclear workers
  - Cosmic radiation (Air crews)

Radon – why is WHO involved ?

- Scientific literature is now suggesting that 6-15% of lung cancers are due to exposure to indoor radon
  - Globally > 70,000 cases (up to 170,000 cases)
  - direct evidence from epidemiological studies of indoor radon
- According to reports from WHO member states, people and politicians are not taking enough notice of this problem.
- Prevention & Mitigation is (relatively) easy
- WHO can bring together many countries to strengthen international approaches to reduce radon health effects and help raise awareness among the public

International Radon Project
Scope and Objectives

- **Scope:**

  A global project, with key international and national partners
- **Overall aim:**

  To reduce the population disease burden due to radon in homes
- **Initial project time frame:**

  2005-2007

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 & Montenegro
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey
- USA
- Ukraine
- United Kingdom

Collaborations

- EC
  - Joint research centre ISPRA
  - Radon surveys in Europe
- IAEA
  - Develops a guide on protection of the public from natural sources of radiation
- National radon activities and institutions

International Radon Project
Scope and Objectives

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. financial institutions as target group)**
- **Estimate the global health impact of exposure to residential radon using available data on radon worldwide**

Global Burden of Disease from Rn

- GBD is the quantification of health effects (mortality and morbidity) caused by risk factors at population level, using a comparable and internally consistent approach
  - Numbers of deaths caused by radon exposure
  - Years of healthy life lost due to radon exposure
- National burden of disease studies for radon completed in Canada, Switzerland, Germany
  - detailed radon exposure analysis
  - more detailed data on smoking, other factors

BD Radon in Germany, Switzerland

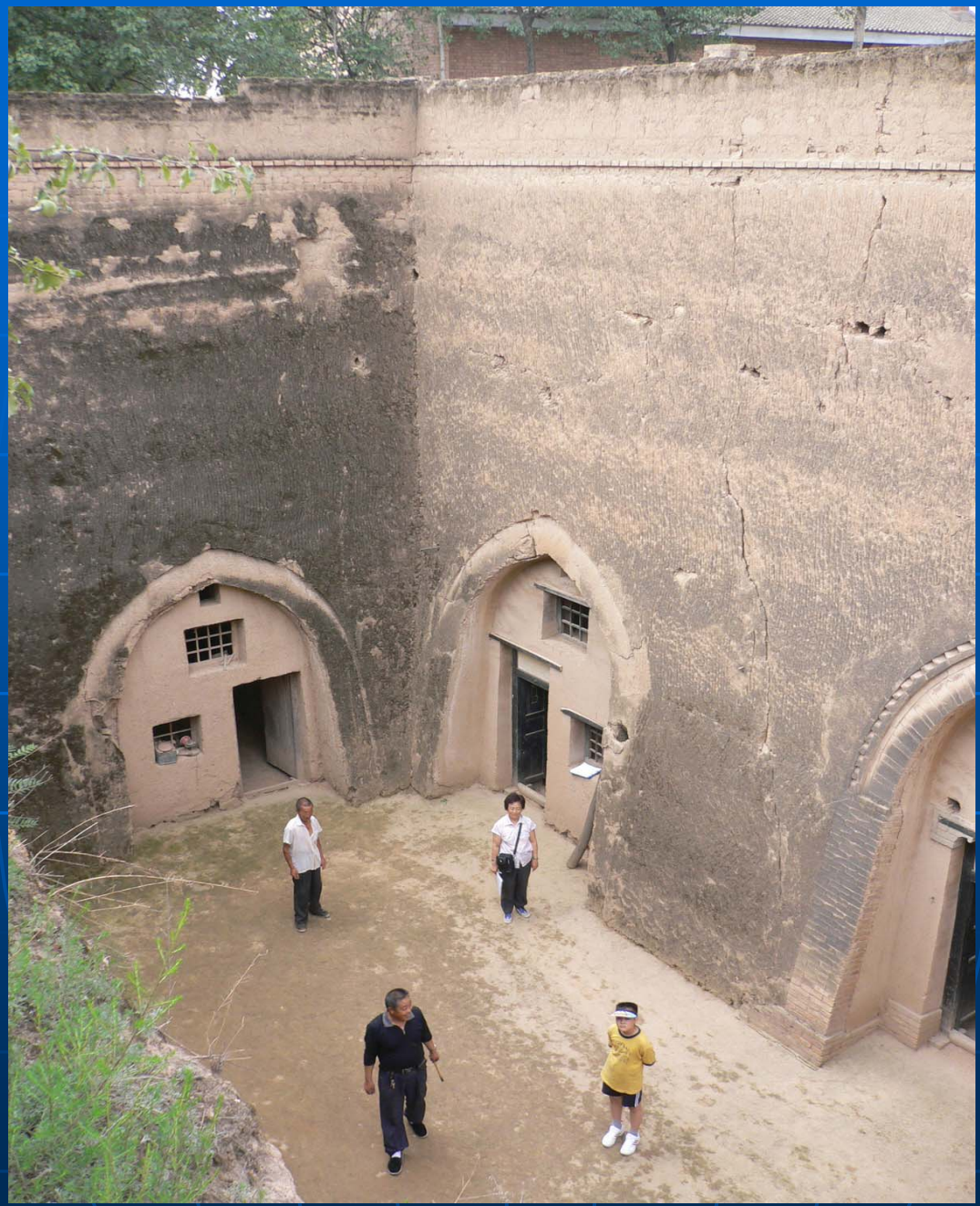
- Germany:
  - Average radon concentration 49 Bq/m^3
  - 37,700 lung cancer deaths annually
  - 5 % (1.7 – 12.6) of all lung cancer deaths attributable to radon
- Switzerland
  - Average radon concentration 78 Bq/m^3
  - 8.4% of male lung cancer deaths from radon (8.7% women)

Why Assess GBD?

- Provides a global (national, regional) picture of health impacts associated with radon
  - Allows comparison with other risks
- Identifies problem areas to focus resources more effectively
- Provides tools for monitoring progress

Mitigation programs

- Make use of the extensive experience in some countries to the benefit of all
- Provide an authoritative assessment of measurement and mitigation approaches
- Provide policy options for national authorities that lead to a reduction in exposure to radon
- Propose international limits on radon concentrations in collaboration with appropriate international and national agencies



Action levels for radon

- Wide international variation
  - But most countries chose levels of 200-400 Bq/m^3
- Epidemiological studies do not provide evidence for a "safe" level
- Most deaths are caused not at the high range but at moderate concentrations
- **But:** high concentrations obviously most serious for the individuals concerned
- Discussions in the WHO IRP support an action level range of 100-400 Bq/m^3

Economic evaluation

- Cost - benefit assessment of different strategies
  - Provide an evidence base for sound decision - making in the prevailing socioeconomic environment
- Comparison with other options to spend money on preventive health issues
- Promote the tools for economic evaluation in environmental health

Example from UK (courtesy of A.Gray)

- Net costs in a study of 62 homes (149 occupants) :
  - Measurement £309,538,
  - Remedial work £59,826
  - Averted lung cancer costs £32,441
    - 6,873 £ per case
  - Total (discounted) £336,923
- Net health benefit:
  - 4.72 cases of lung cancer over 40 years
  - 25.42 life years (discounted)

Cost-effectiveness ratio (cost per life-year gained)

- Radon in homes
  - £13,250
- [Schools]
  - £7,550
- Smoking cessation
  - < £ 1,000
- Breast cancer screening
  - £ 3,000 - ~ 20,000
- lowering cholesterol (cardiovascular dis.)
  - £15,000-£25,000 (primary prevention)
  - £5,000-£10,000 (secondary prevention)

Advocacy and Risk Communication

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

IRP Activities

- Regular meetings
- Working groups on all aspects mentioned
- Forum for international scientific and policy exchange
- Develop WHO radon publications
- Use WHO communication channels to promote radon awareness

Challenges

- Radon and smoking
  - Framing the communication
- Consensus on action levels
- Contribution of building materials
- Continuous or short-term measurements
- Comparability of international radon data

- ….

Radon in Ireland

- High average radon levels: 89Bq/m^3
- Extreme maxima: tens of thousands of Bq
- Ireland at the upper end of Rn levels in Europe
- Estimate of up to 13% of lung cancer deaths attributable to radon in Ireland (~ 200 cases)
- Active existing radon programme (RPII)

Call for action:
radon measurements (homes, workplaces) and mitigation where required

IRP – The Irish Role

- Ireland has a leading role in the IRP
- Important scientific and practical input into the programme
- Two working groups chaired by Irish radon experts (D Fenton, J McLaughlin)
- International links of Irish radon experts useful for WHO project
- Financial support to WHO

Outlook

- Radon as a "natural" health threat is less controversial than man-made radiation threats
- … even though human activities (construction) are behind much of the radon problem
- WHO wants to provide technical support to all countries with radon activities
  - WHO publications should become standard material
  - Radon as largely preventable health threat an important issue of environmental health programmes

- Practical output of the IRP (2007-8):
- WHO Radon handbook
- Global radon burden of disease report

Outlook

- Reducing radon health effects – requires long-term commitment at local, national and global level

Thank you !