

WHO's viewpoint in limiting radon exposure in homes

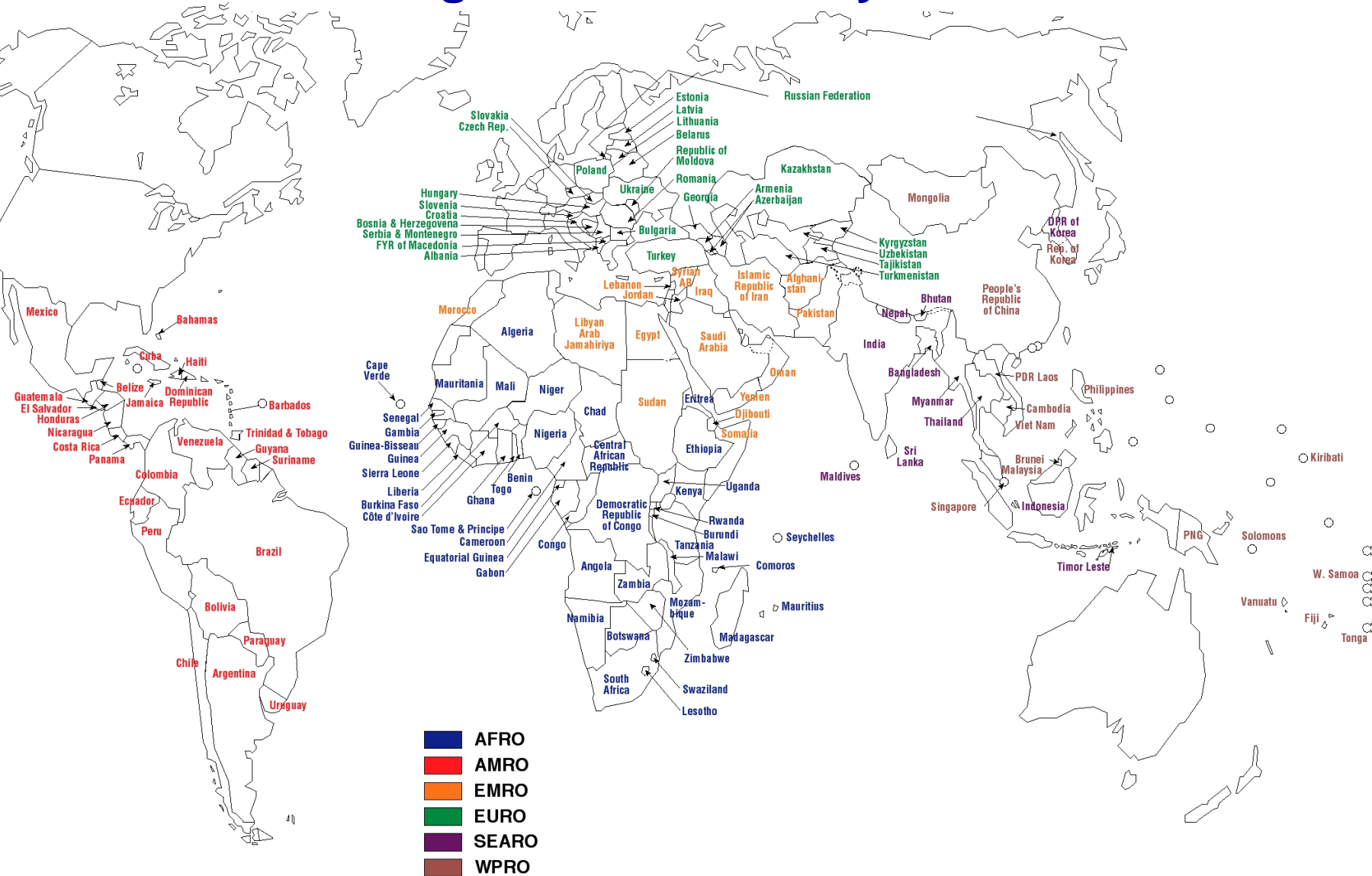
Ferid Shannoun

30 – 31 March 2011, Montbéliard

WHO's role in public health: core functions

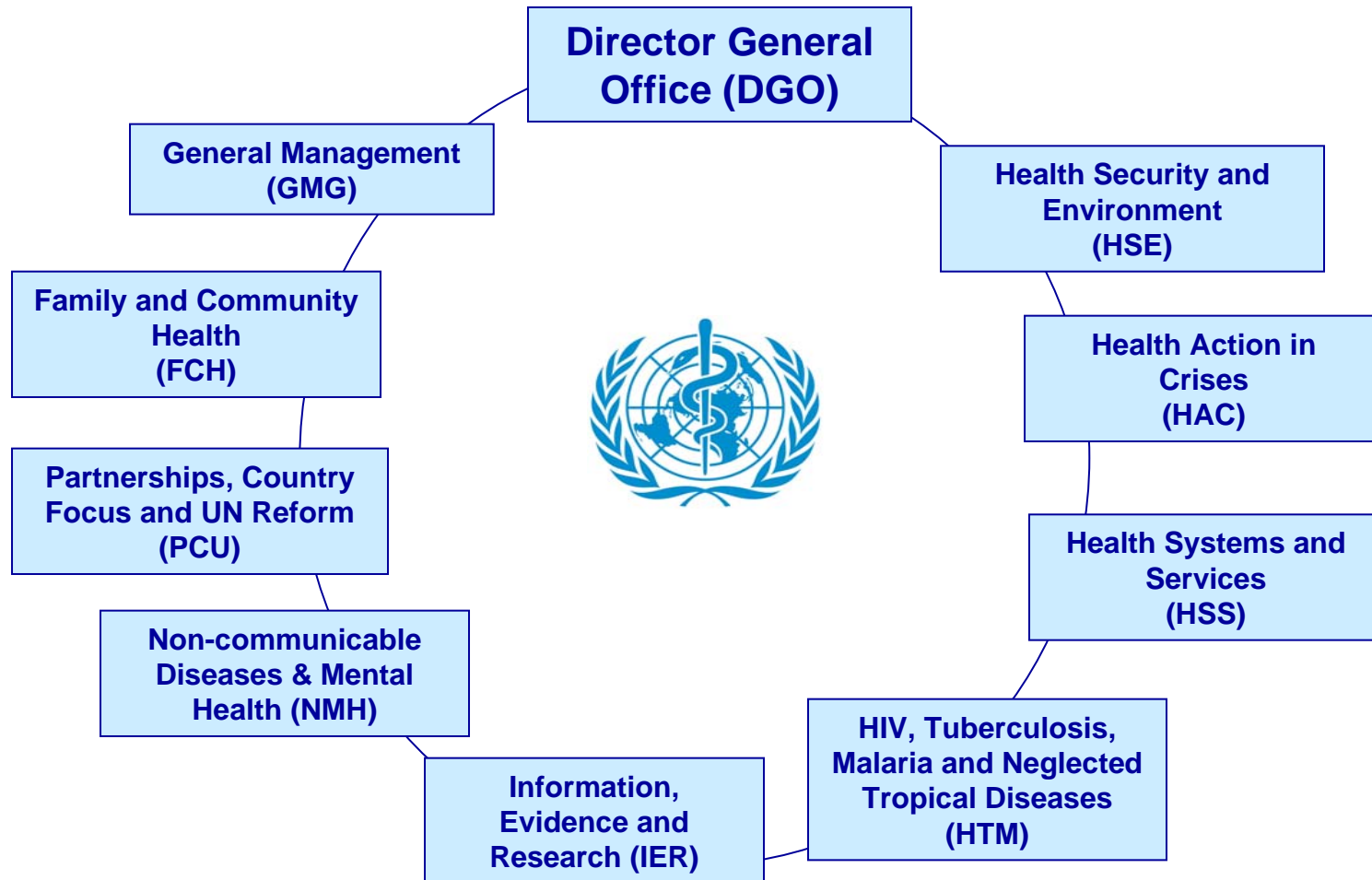
1. Providing leadership on matters critical to health and engaging in partnerships where joint action is needed;
2. Shaping the research agenda and stimulating the generation, translation and dissemination of valuable knowledge;
3. Setting norms and standards and promoting and monitoring their implementation;
4. Articulating ethical and evidence-based policy options;
5. Providing technical support, catalyzing change, and building sustainable institutional capacity; and
6. Monitoring the health situation and assessing health trends.

WHO Regional and Country offices



World Health Organization

Structure of WHO HQ



WHO's Radiation Programme

CLUSTER

Health Security and Environment (HSE)

DEPARTMENT

Public Health and Environment (PHE)

UNIT

Interventions for Healthy Environments (IHE)

PROGRAMME

Radiation (RAD)



International
EMF Project



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Historical background

1979: A WHO/EURO working group on indoor air quality first drew attention to the health effects from residential radon exposures.

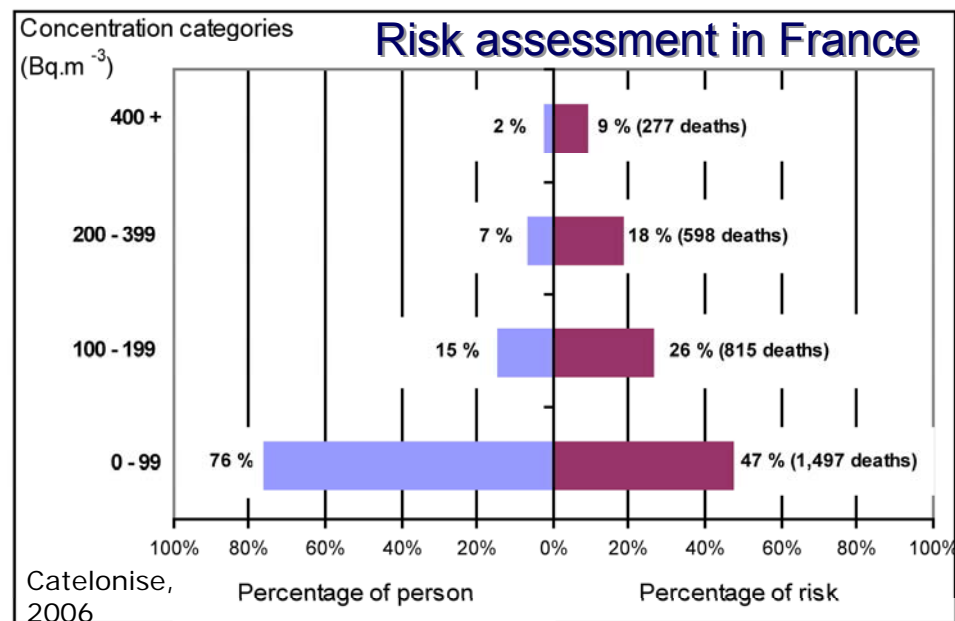
1988: Radon was classified as a human carcinogen by IARC, the WHO specialized cancer research agency.

1993: An international workshop on indoor radon, organized by WHO, involving scientists and radon experts from Europe, North America and Asia considered for the first time a unified approach to control radon exposures and advised on communication of associated health risks.

2005: WHO established the International Radon Project to identify effective strategies for reducing the health impact of radon and to raise awareness about the consequences of long term radon exposures.

Radon as a Public Health issue

- Scientific evidence suggests 3-14% of lung cancers are due to exposure to indoor radon (2nd cause after smoking)
- Annually between 70,000 and 170,000 new cases of lung cancer due to indoor radon exposure worldwide
- Most lung cancer deaths related to radon are associated with low and moderate concentrations in normal dwellings
- Epidemiological studies do not support the evidence of a "safe" threshold level



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Results of residential epi studies (1)

| | Cases | Controls | RR (95% CI) 100 Bq/m ³ |
|-----------------------------------|--------|----------|-----------------------------------|
| 2 Chinese studies (2004) | 1028 | 1974 | 1.13 (1.01 –1.36) |
| only complete (25y) Rn meas. | 464 | | 1.32 (1.09 –1.88) |
| 13 European studies (2004-5) | 7148 | 14208 | 1.08 (1.03 –1.16) |
| corrected for Rn exp. uncertainty | 7148 | 14208 | 1.16 (1.05 –1.31) |
| 7 North-American studies (2005) | 4081 | 5281 | 1.11 (1.00–1.28) |
| only complete (25y) Rn meas. | 1621 | 2323 | 1.21 (1.03 –1.50) |
| All studies (2010) | ~12000 | ~21000 | ? |

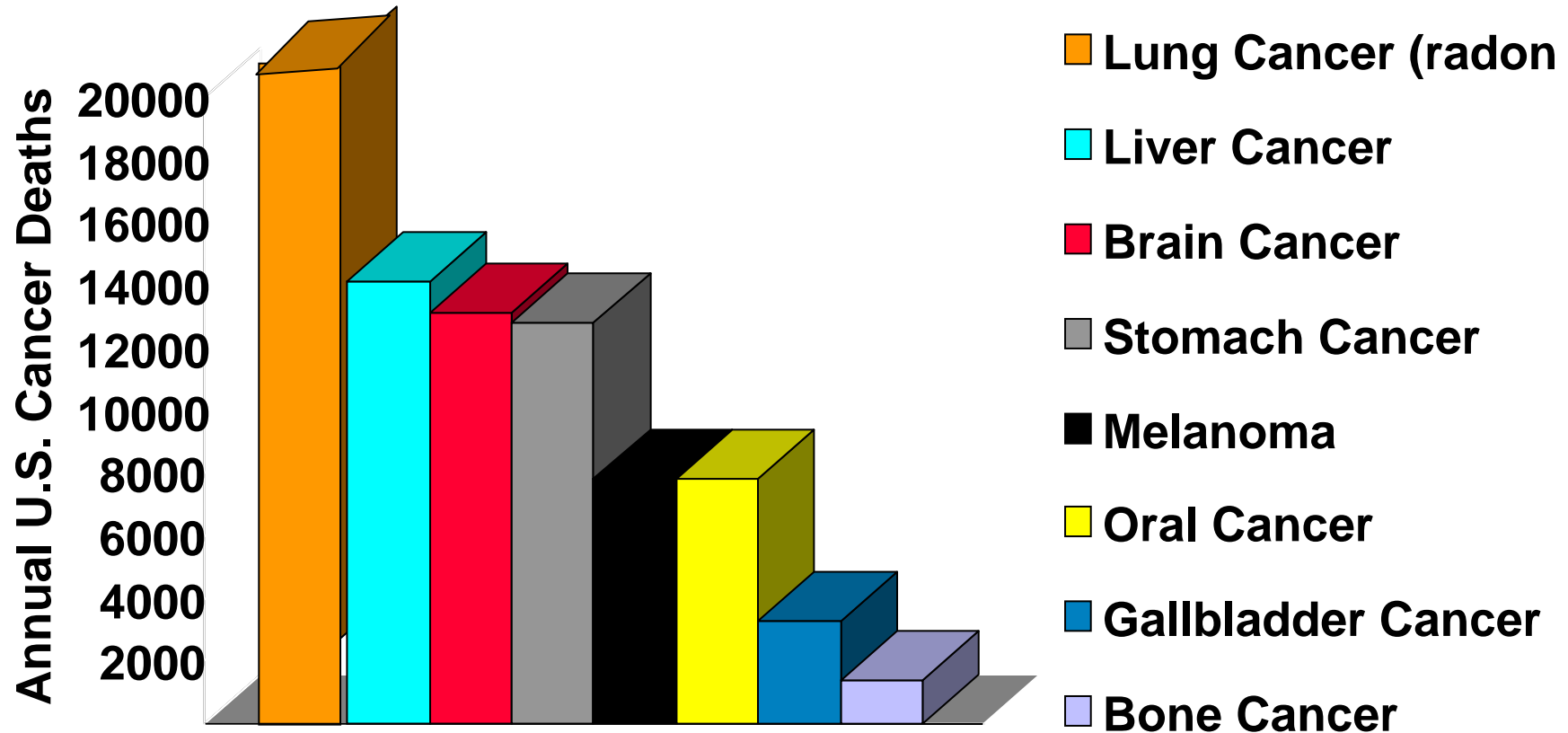


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Results of residential epi studies (2)

- Results are homogenous across studies
 - sufficient statistical power to detect risk of lung cancer at low doses
- Strong synergism between radon and smoking
 - smokers have similar relative risk but much greater absolute risk
- **RR** increase $\approx 10\%$ per 100 Bq/m^3
 - uncertainties on Rn exposure have a large impact (a factor of ~ 2)
- Increased risk of lung cancer observed at levels $< 200 \text{ Bq/m}^3$
 - long-term exposure cumulated over the 30 years

Comparison of radon related cancers to other cancer types in the US [Bill Field]



WHO International Radon Project (IRP)

- **Kick-off:**

2005: launch and first expert meeting in Geneva

- **Scope:**

A global project, with key international and national partners

- **Purpose:**

To reduce the population disease burden due to indoor radon

- **Forum for international scientific and policy exchange:**

Several meetings with ~ 100 scientists and radon experts

WHO-IRP Meetings

1st National Expert Meeting and Kickoff Meeting of the WHO's International Radon Project

17-18 January 2005 - WHO HQ Geneva, Switzerland

2nd Meeting of the WHO's International Radon Project

13-14 March 2006 - WHO HQ Geneva, Switzerland

3rd Meeting of the WHO's International Radon Project

13-15 March 2007 - Munich, Germany

1st Editorial Meeting

3-7 December 2007 - WHO EURO Bonn, Germany

2nd Editorial Meeting

8-9 July 2008 - Mainz, Germany

Launch of WHO Radon Handbook

20 – 23 September 2009 - St. Louis, Missouri



WHO-IRP Partners

- Albania
- Argentina
- Austria
- Belgium
- Brasil
- 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



**World Health
Organization**



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 rocks and soil all over the world. Radon disintegrates through short-lived progeny, which are electrically charged and attach to dust particles. As a result, radon progeny may be inhaled and can damage the DNA and possibly cause cancer.

When radon gas itself is inhaled, it and its progeny may be inhaled but the corresponding dose is very low.

Due to dilution in the air, outdoors, radon is not a health hazard. Radon levels are high in places such as mines, caves, and basements. However, to which large populations are exposed, the greatest exposure to radon is in homes.

Radon in homes

The concentration of radon in the air is determined by the underlying rocks and soils, the exchange between indoor air and outdoor air, and the exchange between indoor air and outdoor air through sumps and drains. Other structural areas in contact with the ground can also contribute to radon exposure.

Exchange of indoor air with outdoor air, habits of the inhabitants, and the time of the year, from day to night, can influence the annual mean concentration of radon. Measurements for radon concentrations give only limited information.



INTERNATIONAL RADON PROJECT

SURVEY ON RADON GUIDELINES, PROGRAMMES AND ACTIVITIES

FINAL REPORT

Health Security and Environment
Public Health and Environment
Radiation and Environment Health

Geneva, 2007

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

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.

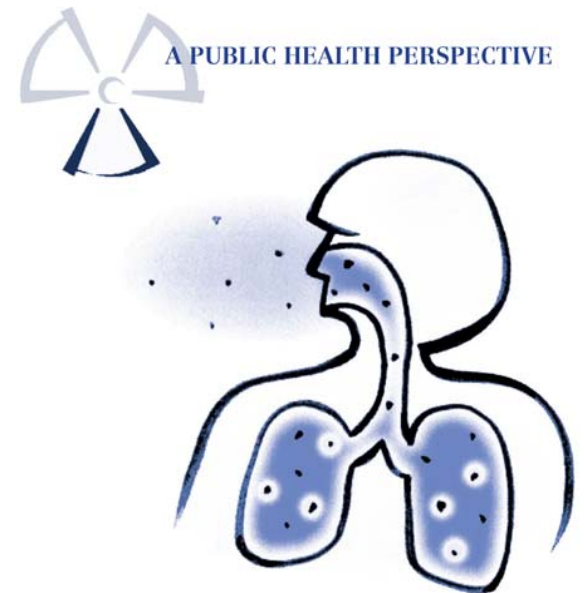
A global project to

Environmental
hazards from
ionizing radiation
to the health
of the population
contribute to
the burden of
disease.



WHO HANDBOOK ON INDOOR RADON

A PUBLIC HEALTH PERSPECTIVE



The International Radon Project (IRP) is a global project to develop and disseminate sound public health policy. The public needs to be aware of radon risks and the means to reduce and prevent these.

In 1996 WHO published a report containing several conclusions and recommendations covering the scientific understanding of radon risk and the need for countries to take action in the areas of risk management and risk communication.

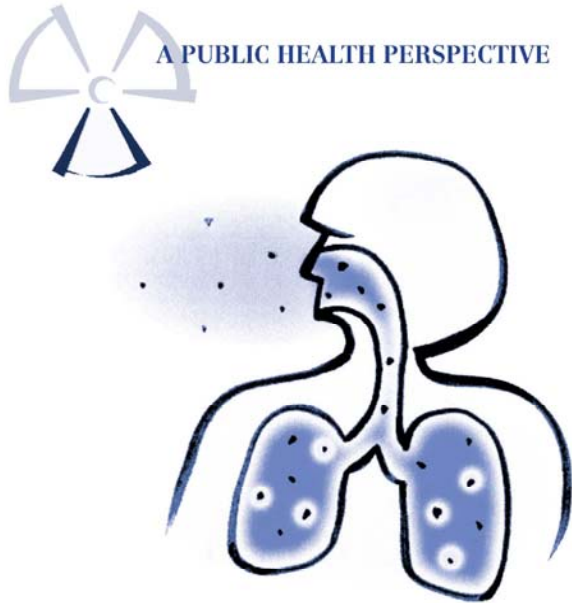
http://www.who.int/ionizing_radiation/env/radon

Montbéliard, 30 March 2011

WHO Handbook on Indoor Radon (2009)

WHO HANDBOOK ON INDOOR RADON

A PUBLIC HEALTH PERSPECTIVE



Structure

Introduction

1. Health Effects of Radon
2. Radon Measurements
3. Prevention and Mitigation
4. Cost-Effectiveness
5. Radon Risk Communication
6. National Radon Programmes

Key messages for each chapter

WHO-IRP Handbook on Indoor Radon

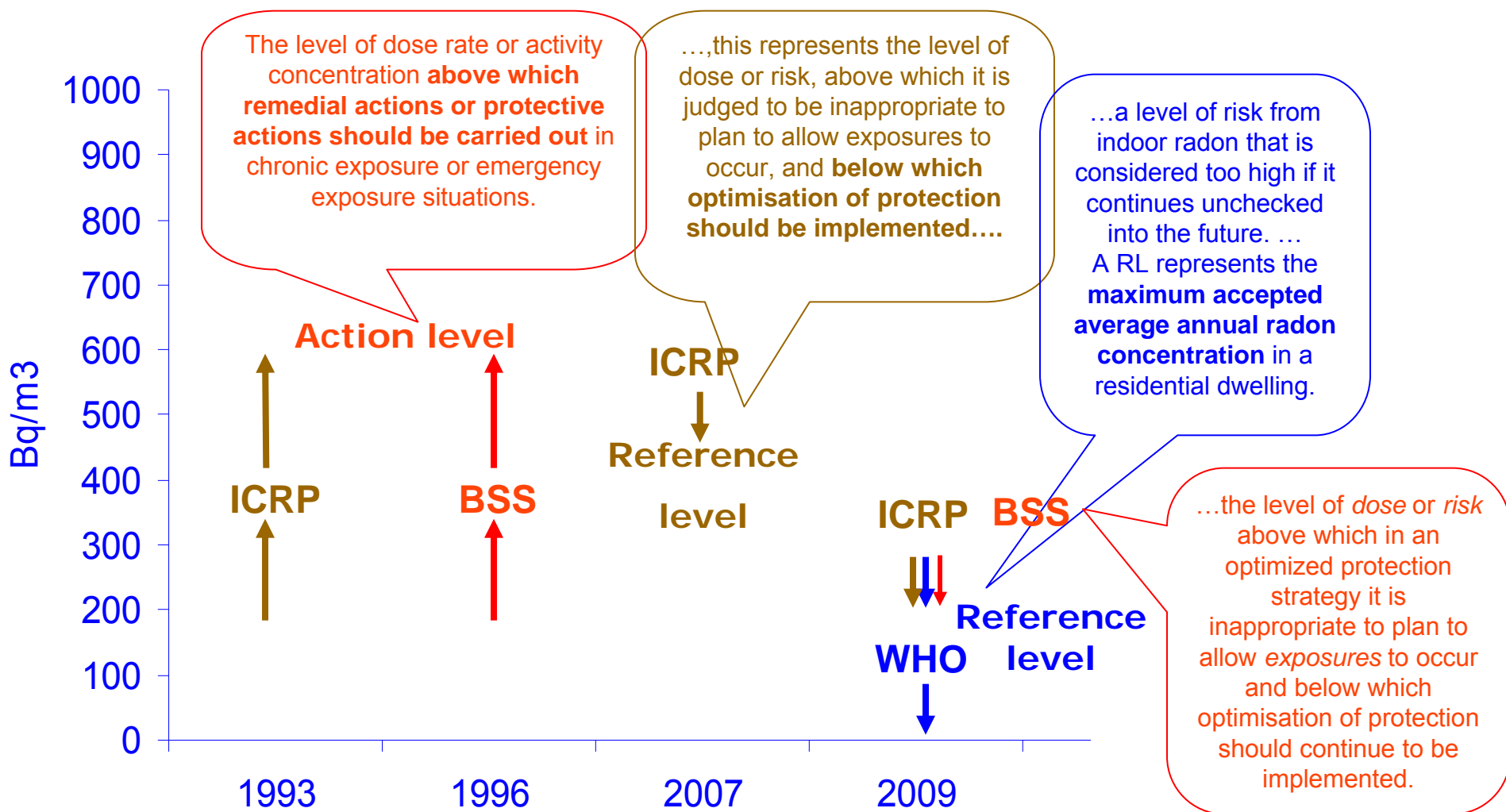
- **Doesn't aim to replace international radiation protection standards or regulations**
- **Conduct national radon surveys**
 - **Trying to get a representative overview of radon in a country, not only from high-radon areas**
- **Link with tobacco control and indoor air quality activities**
- **Implement building regulations (New buildings)**
- **Set national reference level**

WHO-IRP Reference level

- A reference level of **100 Bq/m³** is justified from a public health viewpoint based on the newest scientific evidence
- However, if this level cannot be implemented because of country-specific factors, the reference level should not exceed **300 Bq/m³**
- The decision to set a national reference level needs to take into account the prevailing economical and societal circumstances as well as various national factors such as:
 - Distribution of radon
 - Number of existing homes with high radon concentrations
 - Prevalence of smoking



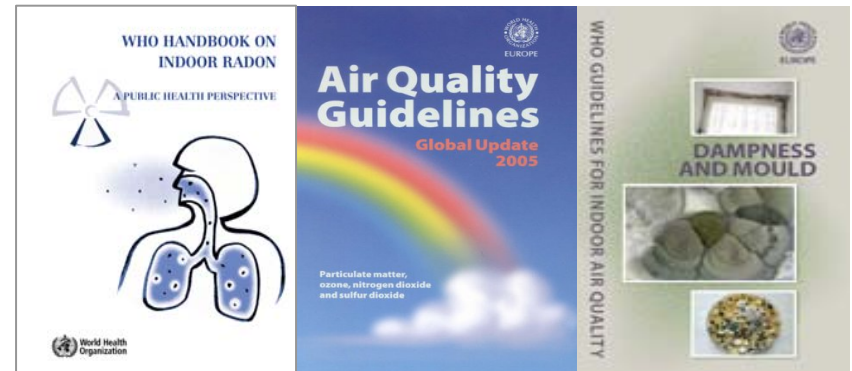
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Radon as a "Healthy Housing issue"

- **WHO Guidelines**
 - Indoor Radon
 - Indoor Air Quality
 - Dampness and Mould
- **Appropriated communication to raise awareness on radon exposures**
 - with focus on Building Sector
- **Better training and education of building professionals**
 - Development of training tools with the involvement of UIA for better mitigation and prevention



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WHO Workshop on Radon Communication for Building Professionals

2 November 2010

WHO HQ, Geneva, Switzerland



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WHO Workshop on Radon Communication for Building Professionals

- To develop communication products for building/mitigation professionals
- To develop related training materials
- To coordinate such activities on international level and to identify partners
- To identify best practices, and communication strategies for building professionals, with the goal of implementing the technical recommendations of the WHO radon handbook
- To address building professionals and to involve them in radon control; especially that new buildings offer an unique chance for radon-free places

Conclusion

- WHO aims to inform and to raise public and political awareness about the risks of exposures to radon
- National radon programs have an important role in reducing the burden of radon exposures
- Better communication to (with) building professionals as well as training and education of building professionals is essential for a better involvement
- WHO cooperates with national and international partners to better use resources and to avoid duplication

Merci de votre attention!



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