

Reducing uncertainties in low dose/low dose rate health risks requires international networking in research implementation and its communication to stakeholders



Presented by Jacqueline GARNIER-LAPLACE, OECD - Nuclear Energy Agency
Scientific secretary of the Committee on Radiological Protection and Public Health

on behalf of the bureau of the NEA CRPPH High-Level Group on Low Dose Research

D. Laurier (HLG-LDR Chair, IRSN, France), V. Chauhan (HC, Canada), D. Klokov (IRSN, France), J-H. Kruse (OECD-NEA), P. Locke (Johns Hopkins University, USA), N. Priest (Canada), K.E. Tollefsen (NIVA and NMBU, Norway)

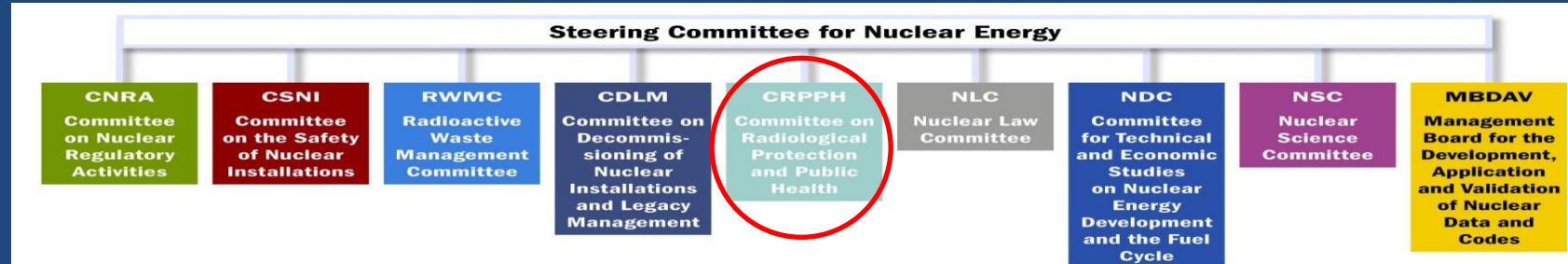
ICRP Digital Workshop, 19-20 October 2021
Session 2 "Risks & Effects"

1- The OECD Nuclear Energy Agency

Seeking Excellence in Nuclear and Radiation Safety, Technology, and Policy

- 34 member countries + strategic partners (e.g., China and India).
- 8 standing technical committees and more than 80 working parties and expert groups; plus the data bank
- Growing global relationships with industry and universities.

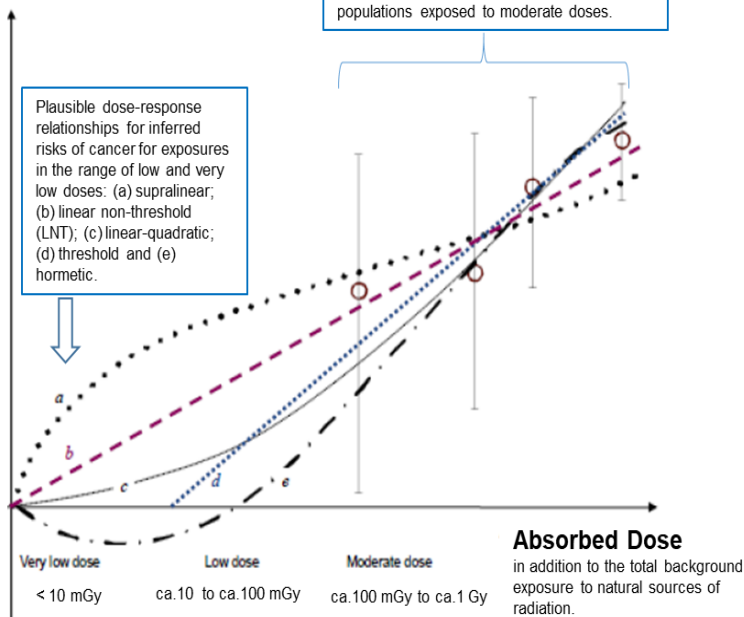
Argentina	Australia	Austria	Belgium
Bulgaria	Canada	Czech Republic	Denmark
Finland	France	Germany	Greece
Hungary	Iceland	Ireland	Italy
Japan	Korea	Luxembourg	Mexico
Netherlands	Norway	Poland	Portugal
Romania	Russia	Slovak Republic	Slovenia
Spain	Sweden	Switzerland	Turkey
United Kingdom	United States		



2 – Why reducing uncertainties in low dose/low dose rate health risks?

In the ranges of very low, low and moderate doses

Risk of Cancer



[adapted from UNSCEAR 2012, Annex A, p27, fig 1]

- Exposure levels are the most frequent among the public and workers;
- Risks are characterised by large uncertainties;
- There are various plausible dose-response relationships for the risk of cancer;
- Recent reviews of biological and epidemiological data tend to provide additional support to the assumption that, for low dose, low dose rate exposures, stochastic effects follow a dose response with no threshold.
- BUT the Linear Non-Threshold - LNT model remains still controversial due to uncertainties in the area of low dose/low dose rate health risks

3 – The problem in short and its consequences

Lots of research have been done and are continuing in this area across the globe, with national or regional funding organisations still giving high importance to this research area .



- Controversies on the assumptions necessary to assess radiation-induced risks at low dose/low dose rates
- Discrepancies between results from radiobiology and epidemiology
- Variation of risks according to individual characteristics
- Uncertainties for cancer risks as well as for some non-cancer effects (e.g. circulatory diseases, cognitive effects, lens opacities); uncertainties with heritable effects

This situation impacts policy, regulation and practice

- Uncertainties drive the way the optimisation of protection has been implemented for many years, very often interpreted as minimisation of radiological exposure
- Uncertainties make radiation risk communication to the public difficult

4- What are the actions needed?



- Make the best use of existing knowledge
- Identify gaps
- Assemble the knowledge in a consistent manner
- Promote mechanism-based approach for less uncertain inference from high doses/dose rates to low doses/dose rates
- Integrate biological evidence on radiation-induced cancers (and non-cancer effects) with epidemiological results
- Leverage the efficiency of research (including the financial aspects)
- Improve communication of research results for policy-makers

The High-Level Group on Low Dose Research's vision

1- Increasing global networking

2- Better coordination of ongoing/future low dose research projects

3- Improving the effectiveness/efficiency of research for policy and regulation

5- The HLG's activities: 3 topical groups

- Creation of an online Low Dose Research Database
- Implementation of a Rad/Chem AOP joint topical group
- Development of a policy-oriented & promotional communication strategy

5- The Low Dose Research Database

To enhance visibility of ongoing/future research projects worldwide

Main features

- Focus on current and in-planning studies in the low dose (rates) range
- Broad coverage with a large diversity of research projects, (*radiobiology, ecotoxicology, epidemiology, dosimetry, social sciences*)
- A simple description of research projects, keywords, main features, PI's contact details, links to access to additional information

Main objectives

- Facilitate proactive networking and collaboration among researchers
- Serve as a user-friendly catalogue to search such projects worldwide
- Keep governmental bodies informed on major advances
- Help decision-making in funding research



5- Exploring the Adverse Outcome Pathway (AOP) Framework

To facilitate collaboration and co-ordination between the chemical and radiation fields for effective uptake of the OECD AOP framework in the understanding of low dose low dose-rate effects.

Main objectives

- Demonstrate efficiency of approach to identify knowledge gaps through better organisation of data
- Advance understanding on low dose effects and health outcomes for human and non-human species
- Bringing together epidemiologists and biologists
- Demonstrate the value of collaborative studies
- Contribute to and advance the goals of the OECD AOP programme towards non-chemical stressors

MIE



KE₁



KE₂



KE_n



AO

5- Develop a policy-oriented & promotional communication strategy

Improving communication on low dose risks and uncertainties and adapt it to targeted audience

- Identify the issues of concern in the low-dose area that would deserve clearer communication: implication of the LNT, separation between science and judgement, bring in social dimension of risk (reasonableness, tolerability, acceptability)
- Identify the available data/tools that can help in making communication more efficient
- Exercise how to translate technical results into policy-oriented messages
- Create a fast track between research results and science-based policies and regulations.



Promote engagement of research funding organisations

- Identify a communication strategy for engaging national or regional funding organisations
- Develop strategies for identifying research gaps, using the AOP framework and the low dose research database
- Promote multilateral collaboration to undertake joint research projects.

6- The HLG-LDR's contribution to the revision of the ICRP system (and beyond)

The HLG-LDR will

- facilitate global networking of low dose research funding organisations and research implementing organisations,
- develop a policy-oriented communication strategy on risk uncertainties,
- enhance the impact of research,
- have implications for radiological protection policy, regulation and implementation.

7- Membership and governance

- **Current membership**

- 59 experts from 13 countries
- Invitees from international or regional associations depending on the agenda

- **Governance of the HLG-LDR**

- Chair: D. Laurier (IRSN, France)
- NEA Sec.: J. Garnier-Laplace; J.H. Kruse

- **Coordination of the 3 topical groups**

- LDR Database – Co-Chairs: Dmitry Klokov (IRSN), Nick Priest (UK)
- Rad/Chem AOP Joint Topical Group- Co-chairs: Vinita Chauhan (HC, Canada), Knut Erik Tollefsen (NIVA, Norway), with the assistance of: Danielle Beaton (CNL, Canada)
- Policy-oriented Communication Strategy - Chair: Paul Locke (Johns Hopkins University, US)

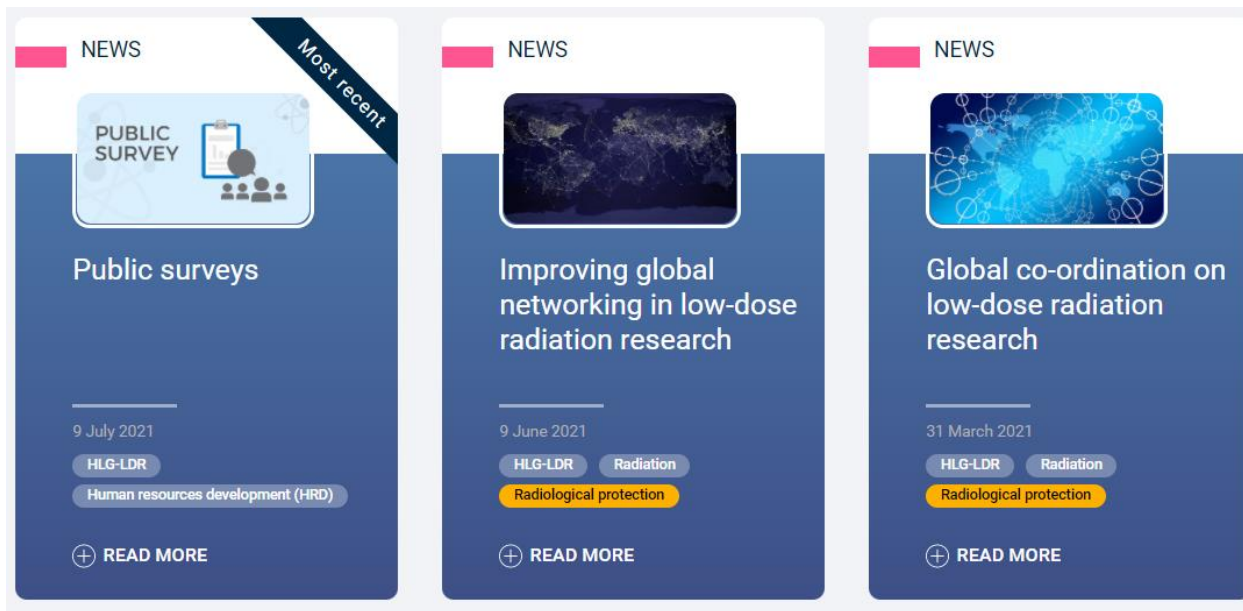
 Argentina	 Australia ✓	 Austria	 Belgium ✓
 Bulgaria ✓	 Canada ✓	 Czech Republic	 Denmark
 Finland ✓	 France ✓	 Germany ✓	 Greece
 Hungary ✓	 Iceland	 Ireland	 Italy ✓
 Japan ✓	 Korea	 Luxembourg	 Mexico
 Netherlands	 Norway	 Poland	 Portugal
 Romania	 Russia	 Slovak Republic	 Slovenia
 Spain	 Sweden ✓	 Switzerland	 Turkey
 United Kingdom ✓	 United States ✓		

Thank you for your attention!

https://www.oecd-nea.org/jcms/pl_58142/high-level-group-on-low-dose-research-hlg-ldr

https://www.oecd-nea.org/jcms/pl_59579/improving-global-networking-in-low-dose-radiation-research

https://www.oecd-nea.org/jcms/pl_60020/international-horizon-style-exercise-to-evolve-the-use-of-the-adverse-outcome-pathway-aop-framework-in-radiation-research-and-regulation



NEWS

Most recent

PUBLIC SURVEY

Public surveys

9 July 2021

HLG-LDR

Human resources development (HRD)

+ READ MORE

NEWS

Improving global networking in low-dose radiation research

9 June 2021

HLG-LDR Radiation

Radiological protection

+ READ MORE

NEWS

Global co-ordination on low-dose radiation research

31 March 2021

HLG-LDR Radiation

Radiological protection

+ READ MORE