

The High-Level Group on Low-Dose Research (HLG-LDR)

Global Networking for Low Dose Research



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Presentation on behalf of the HLG-LDR by Paul A. Locke

Interagency Steering Committee on Radiation Standards (ISCORS)
Washington, DC, USA
28 November 2023

Outline

1. Introduction to the OECD Nuclear Energy Agency (NEA) and its standing technical committee dedicated to radiological protection
2. The HLG-LDR : background, justification and vision
3. The HLG-LDR : from the vision to a 3 year (and beyond) work plan
4. HLG-LDR membership and governance
5. Progress/updates and future meetings



































Disclosures

The initial PPT was developed by members of the HLG-LDR and adapted for this meeting by Paul Locke

1- The OECD Nuclear Energy Agency (1/2)

33 Countries Seeking Excellence in Nuclear Safety, Technology, and Policy

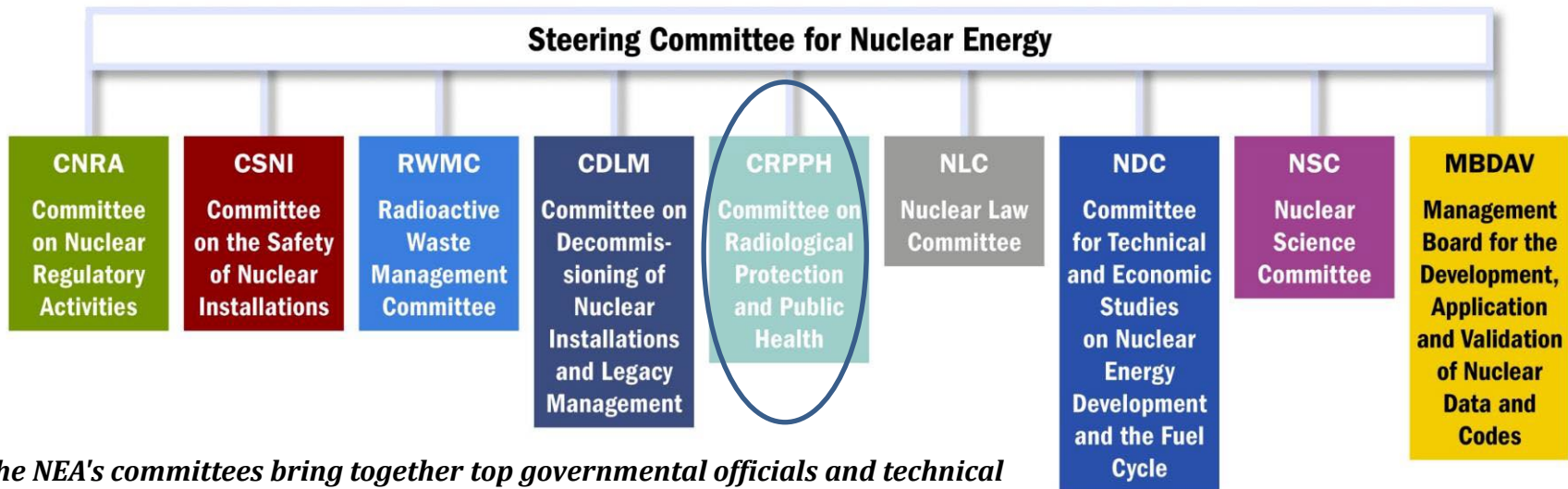
- 33 member countries + strategic partners (e.g., China and India).
- 8 standing committees and more than 80 working parties and expert groups.
- The NEA Data Bank - providing nuclear data, codes, and verification services.
- Growing global relationships with industry and universities.

 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		

NEA countries operate about 81% of the world's installed nuclear capacity

1- The OECD Nuclear Energy Agency (2/2)

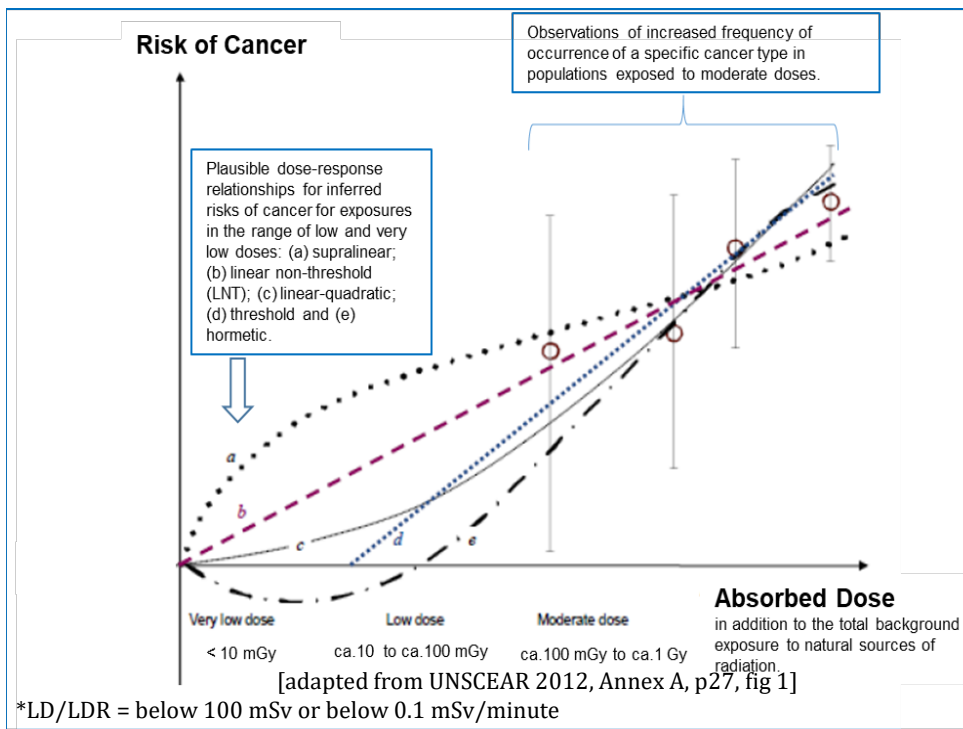
NEA Committee Structure



The NEA's committees bring together top governmental officials and technical specialists from NEA member countries and strategic partners to solve difficult problems, establish best practices and to promote international collaboration.

2 – The High-Level Group on Low Dose Research: Why ? (1/5)

Why is low-dose/low-dose rate* research area important?



- Various plausible dose-response relationships for the risk of cancer in the ranges of very low, low and moderate doses
- Risks in the low dose (rate) range characterised by large uncertainties
- Assumption made for radiation protection is that, for low-dose (rate) exposures, stochastic effects (e.g. cancer risk) are assumed to follow a dose response with no threshold.
- The Linear Non-Threshold - LNT model remains controversial due to uncertainties in the area of low dose/low dose rate health risks

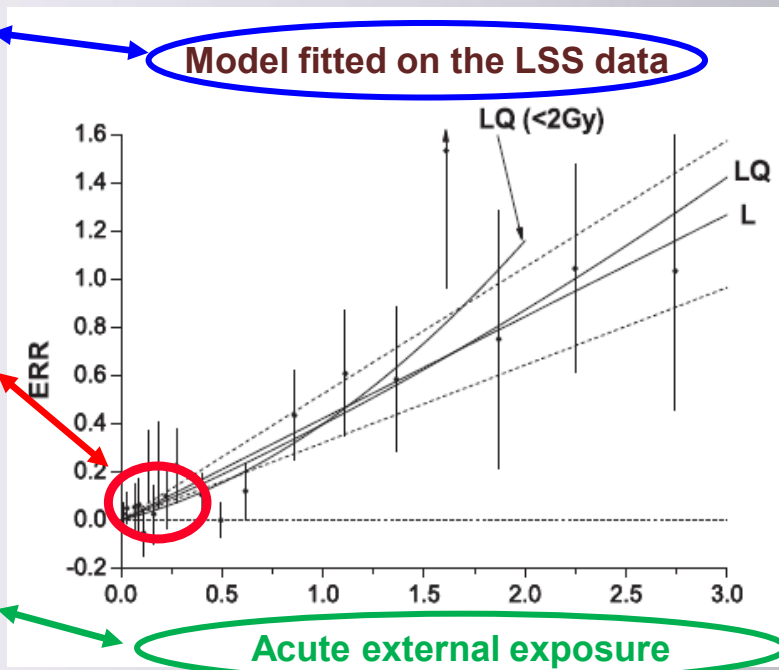
2 - The High-Level Group on Low Dose Research- Why ? (2/5)

Assessment of radiation-induced risks at low dose: necessary assumptions

Transposition: application of the relationship to a population different from the one on which it was estimated

Extrapolation: application of the relationship below the dose range over which it has been estimated

Analogy: application of the relationship to exposure situations different from that of the population on which it was estimated.



2 – The High-Level Group on Low Dose Research – Why? (3/5)

Challenges related to the scientific uncertainties in the low dose (rate) area

The problem in short

Lots of research have been done across the globe and is continuing.

National or regional funding organisations are still giving high importance to this research area

Open questions still remain :

- Controversies on the extrapolation of risks at low doses and 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).

The impact of these uncertainties

- 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
- Reducing this uncertainty would improve the robustness of the radiation protection system and should help to better structure and size radiological protection decisions.

2 – The High-Level Group on Low Dose Research – Why? (4/5)

The vision

Developed by a core group in 2019 to frame the mandate of the HLG-LDR, following a scoping meeting in 2018 where participants (35 delegates from 13 countries) recommended the establishment of a HLG to support the development of a global coordination initiative for low dose radiation research.

The HLG-LDR will **support radiological protection** policy, regulation and application choices by **improving the effectiveness and efficiency of research** through **global networking** for the coordination of ongoing and future low-dose research projects. The HLG-LDR will support the **communication of research project** objectives and results to stakeholders

2 - The High-Level Group on Low Dose Research – Objectives, Topical Groups (5/5)

The vision

.....*translated into*

Topical Groups/CC activities

The HLG-LDR will support radiation protection policy, regulation and application choices by:

- 1- Increasing global networking**
- 2- Better coordination of ongoing/planned low dose research projects**
- 3- Improving the effectiveness/efficiency of research for policy and regulation.**

Cross-cutting Activities on Policy-Oriented

Communication Strategy – Co-chairs: P.

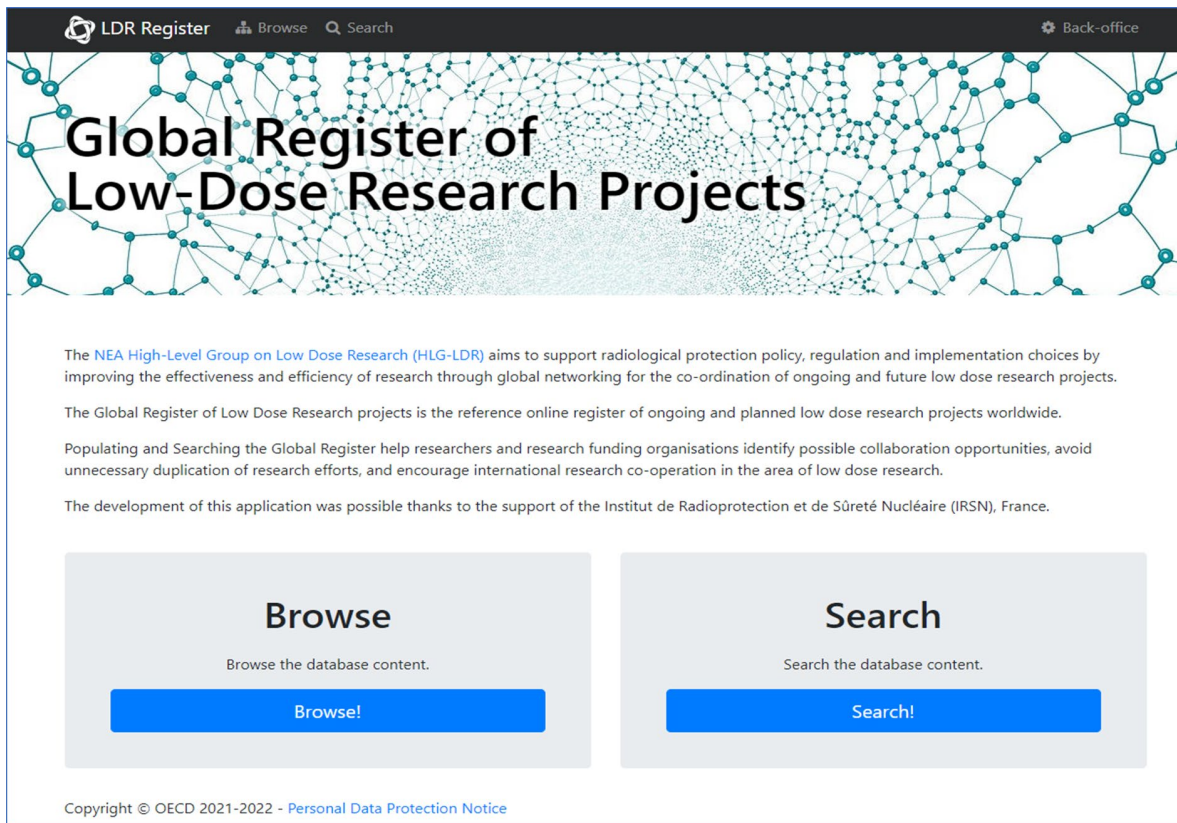
Locke, M-C Gregoire



The Global Register of Low Dose Research Projects

D Klokov¹, N Priest², N Soppera³, P Locke⁴, J Garnier-Laplace³, D Laurier¹

¹Institut de Radioprotection et de Sûreté Nucléaire, France, ²Université Laval, Canada, ³Organisation for Economic Co-operation and Development, Nuclear Energy Agency, ⁴Johns Hopkins Bloomberg School of Public Health Baltimore, Maryland, USA



The screenshot shows the website interface for the Global Register of Low-Dose Research Projects. At the top, there is a dark navigation bar with the logo 'LDR Register', a 'Browse' button with a list icon, a 'Search' button with a magnifying glass icon, and a 'Back-office' button with a gear icon. Below the navigation bar is a large banner with a network diagram background and the title 'Global Register of Low-Dose Research Projects'. The main content area contains three paragraphs of text explaining the purpose of the register and the support it received. At the bottom, there are two large light gray buttons: 'Browse' and 'Search', each with a blue button below it labeled 'Browse!' and 'Search!' respectively. The footer contains the copyright notice: 'Copyright © OECD 2021-2022 - Personal Data Protection Notice'.

LDR Register Browse Search Back-office

Global Register of Low-Dose Research Projects

The NEA High-Level Group on Low Dose Research (HLG-LDR) aims to support radiological protection policy, regulation and implementation choices by improving the effectiveness and efficiency of research through global networking for the co-ordination of ongoing and future low dose research projects.

The Global Register of Low Dose Research projects is the reference online register of ongoing and planned low dose research projects worldwide.

Populating and Searching the Global Register help researchers and research funding organisations identify possible collaboration opportunities, avoid unnecessary duplication of research efforts, and encourage international research co-operation in the area of low dose research.

The development of this application was possible thanks to the support of the Institut de Radioprotection et de Sûreté Nucléaire (IRSN), France.

Browse
Browse the database content.
Browse!

Search
Search the database content.
Search!

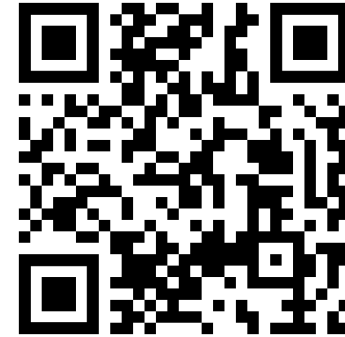
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Development of a Global register of low-dose research projects

- To enhance visibility
- To promote networking and collaboration
- To enhance decision making
- To keep stakeholders up-to-date



Try it out today

Tool: open online searchable library hosted by NEA: <https://www.oecd-nea.org/ldr>

Inclusion: ongoing or planned original research in the field of low doses and low dose rates

Scope: epidemiology, radiobiology, dosimetry, ecotoxicology, social sciences and humanities

For each LDR project: 30+ fields such as principal investigators name and contact, funding agency, partners, type of study, type of radiation used, dose and dose-rate range used, experimental model, endpoints...

Management: completion check, site management, regular reminders for updates

Easy to use: quick and easy entry online, consultation and search tools

3- Activities: Exploring the Adverse Outcome Pathway (AOP) Framework

A Rad/Chem AOP joint task group has been implemented to help advance radiological and chemical research using the AOP approach.

Vision: Facilitate collaboration and co-ordination between the chemical and radiation fields for effective uptake of the AOP framework in the low dose (rate) area.

Mission:

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



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

4 - Current Membership and governance

Current membership

- 69 experts from 16 countries (ca. 40 organisations involved in Research)
- Invited non member countries: China, UAE, India
- Invitees from international or regional organisations/associations depending on the agenda

Governance of the HLG-LDR

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

Funding governance

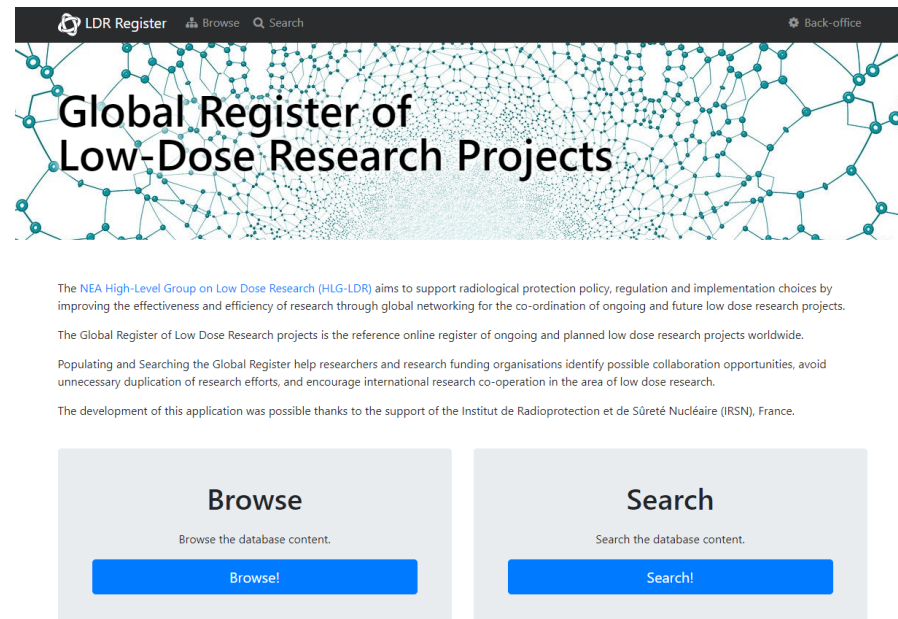
- The HLG-LDR is mainly funded by the contribution of countries to the OECD-NEA (“assessed contributions”)
- Additionally, the HLG has received voluntary contributions of 45k€ from IRSN (France) and 60k€ from BMUV (Germany).
- Additional VCs are welcomed; the offer mechanism is very simple.
- The AOP Horizon Style exercise was funded through the Canadian Organization on Health Effects from Radiation Exposure (COHERE).
- In-kind offers (e.g. hosting a meeting, workshop, loaning staff,) are welcomed.

 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	<small>Suspended since 11 May 2022</small>  Russia	 Slovak Republic	 Slovenia
 Spain	 Sweden ✓	 Switzerland	 Turkey
 United Kingdom	 United States ✓		

5- Progress and future activities (1/3)

► The Global register of ongoing and planned low-dose research projects is now open – please submit your work!

- The Global Register aims to become a central online register of ongoing and planned low dose and low dose-rate research projects worldwide
- Populating and searching the Global Register will facilitate coordination of research, provide mechanisms for research funding, and encourage international co-operation in the area of low dose and low dose-rate research
- The Register was first opened (i) to HLG-LDR members in October 2022; and (ii) to all in late March 2023. The version comprises guidance for users to input their projects;
- Now 40 accounts and around 35 projects were entered.
- **The tool will only be useful if you use it and enter your projects!**



The screenshot shows the website interface for the Global Register of Low-Dose Research Projects. At the top, there is a navigation bar with 'LDR Register', 'Browse', 'Search', and 'Back-office' links. The main heading is 'Global Register of Low-Dose Research Projects'. Below the heading, there is a paragraph of text explaining the purpose of the register and the HLG-LDR group. At the bottom, there are two large buttons: 'Browse' and 'Search', each with a corresponding description and a 'Browse!' or 'Search!' button below it.

LDR Register Browse Search Back-office

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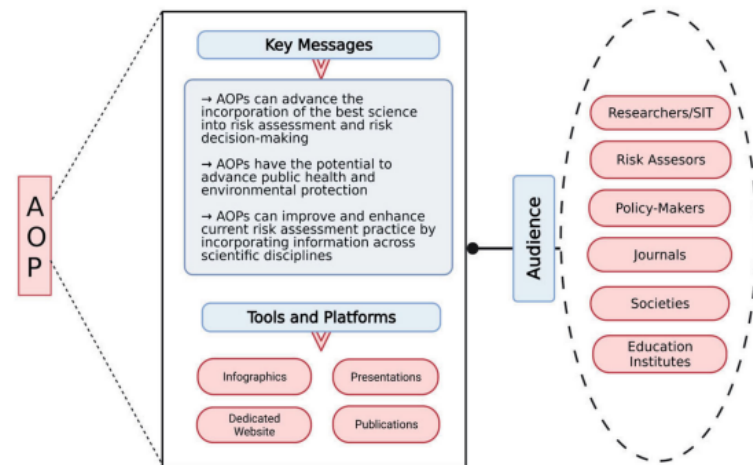
To find out more, visit
www.oecd-nea.org/ldr



5 - Progress and future activities (2/4)

► On going activities to develop a policy-oriented & promotional communication strategy

- Explain/promote the role of new approaches in low dose risk communication (Research projects register; AOP use)
 - ✓ Open access article in IJRB by Chauhan et al, 2022
 - ✓ Development of “white paper” in the future
- Outreach to the international radiation protection and research community
- Promote the Global Register to facilitate collaboration/mutualisation for researchers and funding bodies
 - ✓ Presentations made in various international forum, conferences and related papers; liaison with UNSCEAR, ICRP
 - ✓ Agreed by the PIANOFORTE Executive Board to include a reference to the Global Register in their research Calls



From Chauhan *et al.* 2022. Establishing a communication and engagement strategy to facilitate the adoption of the adverse outcome pathways in radiation research and regulation, *IJRB*

<https://doi.org/10.1080/09553002.2022.2086716>

5- Progress and future activities (3/4)

► Dissemination of the AOP framework within the Radiation Research Community

Horizon Style Exercise (HSE)

- Survey to identify priority areas for AOP development.

Workshop/Outreach Activities

- Organize focused workshops, training and meetings

Engaging societies and journals

- Facilitate dissemination & reuse of AOP-relevant data/information

Case examples (AOPs)

- Develop AOPs (vascular, leukemia, development, reproduction, bone loss, cataracts,) and omic-informed AOPs

Review on Ecological-relevant AOPs

- Provide overview of knowledge & knowledge gaps in AOPs relevant to radioecology.

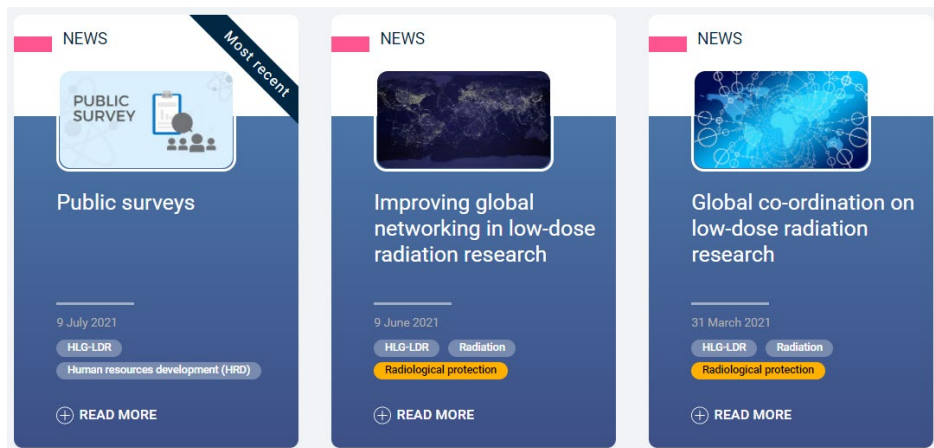
- First step to disseminate the AOP framework within the radiation community by encouraging researchers, policymakers, regulators and other stakeholders to share their views on the AOP values through the HSE
- Excellent dissemination of first AOP developments through the special issue of IJRIB and orals/posters in relevant international conferences
- Other collaboration with OECD AOP development programme to include ionising radiation within the stressors of interest (2 papers)
- The reviewed AOP 272 on “Deposition of Energy Leading to Lung Cancer” now approved by the OECD & NEA ad hoc committees. Comments received for better link with epidemiological data. These were integrated for evidence purpose in the last version. Publication in the OECD iLibrary of the series of AOPs is in progress.

5- Future meeting (4/4)

- Next plenary meeting – 25-27 June 2024
- Will be held at NEA in Boulogne-Billancourt, France
- Organised in cooperation with the International Dose Effect Alliance Workshops chaired by EPRI (US)
- Other regional, national, international low-dose research co-ordination initiatives will be included (such as [COHERE](#), [PLANET](#), [MELODI](#))

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



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9 July 2021

HLG-LDR Human resources development (HRD)

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Improving global networking in low-dose radiation research

9 June 2021

HLG-LDR Radiation Radiological protection

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NEWS

Global co-ordination on low-dose radiation research

31 March 2021

HLG-LDR Radiation Radiological protection

⊕ READ MORE

EXTRA SLIDES

Extension of the HLG-LDR mandate

► **Current mandate**

- The HLG-LDR current mandate will expire on 30 May 2024.
- A 3-y extension has been approved with anticipation by the CRPPH at the annual meeting (4-6 April 2023).
- Now seeking for consolidation of the decision by the HLG-LDR

► **Building the PoW 2024-2027**

- Continuation of a number of activities of the topical groups and communication strategy
- Opportunities for new topical projects according to the upcoming discussion during this meeting, including group of expert, workshop, event....

Perspectives for enhancing global coordination of radiation research programmes worldwide

► Catalysts for international coordination

- Global Register of Low Dose Research Projects;
- Deliverables publicly available (e.g. AOP Questions - gaps; AOP development in liaison with OECD dedicated programme; communication tools; forum to exchange through events; liaison with UNSCEAR, ICRP...)
- Exploration of mechanisms such as joint undertaking gathering private and public organisations from interested countries, including access to state-of-the-art facilities (*not started yet*)

► Looking for new opportunities to support the activities of the HLG-LDR via voluntary contributions and/or in-kind offers

3- From the vision to the work plan

The HLG-LDR supports radiation protection policy, regulation and application choices by:

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

- develop approaches and tools to share information on ongoing and planned research worldwide as well as to improve structuring the existing knowledge on radiation-induced effects on humans and non-human species;
- use new approaches and tools to identify research gaps, and develop mechanisms for prioritisation and coordination worldwide;
- share experience so that research results are efficiently communicated to stakeholders.



3- Activities: 3 topical groups

Implementation of three topical groups

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

3- Activities: The Low Dose Research Database

A Low Dose Research Database has been launched. Its goal is to enhance visibility of ongoing and future research projects, promoting networking and collaboration worldwide

Main features/objectives

- A simple description of research projects, with keywords, main features, and links to contact the principal investigator and to access to additional information
- Broad coverage with a large diversity of research projects, including radiobiology, ecotoxicology, epidemiology, dosimetry, social sciences
- Focus on current and in-planning studies in the low dose (rates) range
- Serve as a user-friendly catalogue to search such projects worldwide
- Facilitate proactive networking and collaboration among researchers
- Keep governmental bodies (e.g., TSOs and regulators) informed on major advances
- Help decision making in funding research