UK Health Security Agency

UKHSA (radiation protection) Scientific perspective on the role of ICRP

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Introduction

UK Health security agency's mission is :

To reduce harm from infectious disease and other health security hazards

Our vision is :

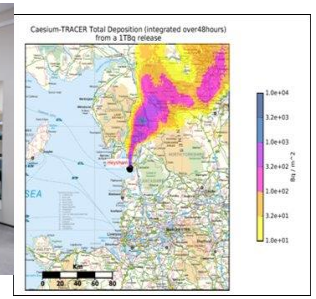
To secure health and prosperity through science

For ionising radiation, we :

Provide public health expertise to support delivery of radiological and nuclear planning and response work

In practice, we :

Offer a full range of research, development, service, advice and guidance related to safe use of ionising radiation in society



Radiation Effects Department (RED)

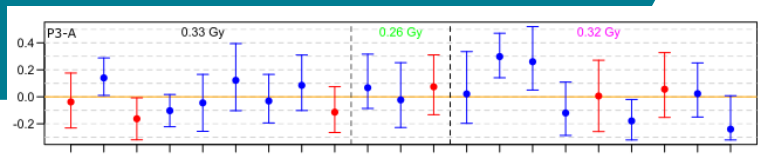
The key work of RED is research carried out both independently and in collaboration with universities and institutes from across the UK and around the world.

Funding comes mainly from the UK Government and EU grants. Radiation Effects - Home (ukhsa-protectionservices.org.uk)

The Department has the following key functions:

1. To conduct and publish **experimental research** into the effects of **ionising and non-ionising radiation** to improve health risk assessment
2. To conduct and publish **epidemiological analyses on radiation risk**, especially in relation to UK occupational ionising radiation exposure risk
3. To provide a source **of expert knowledge on the risks** and biological **effects** of radiation to facilitate the development of appropriate radiation protection standards and advice in partnership with government, international bodies and others and to support RCE in training and advisory group activities
4. Provision of support to **emergency response** activities particularly through provision of a biological dosimetry service UKHSA Chromosomal Dosimetry Services - Introduction (ukhsa-protectionservices.org.uk) and through support for off site advice during exercise and emergencies

Some recent RED work

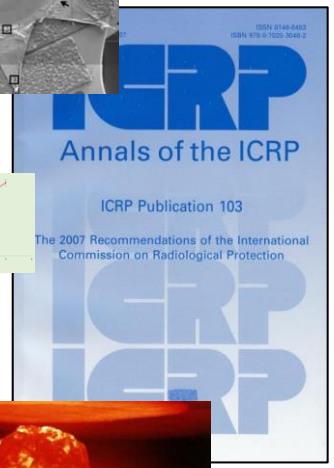


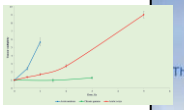
Radiation and Cancer

- The latest gene analysis tools are used to elucidate **mechanisms of radiation-induced cancers**, in particular leukaemia.

Non cancer diseases: Cataract and cardiovascular disease

- The mechanisms are not well known but recent work at UKHSA has contributed to revised safety standards to protect the lens of the eye, for example





Radiation Epidemiology

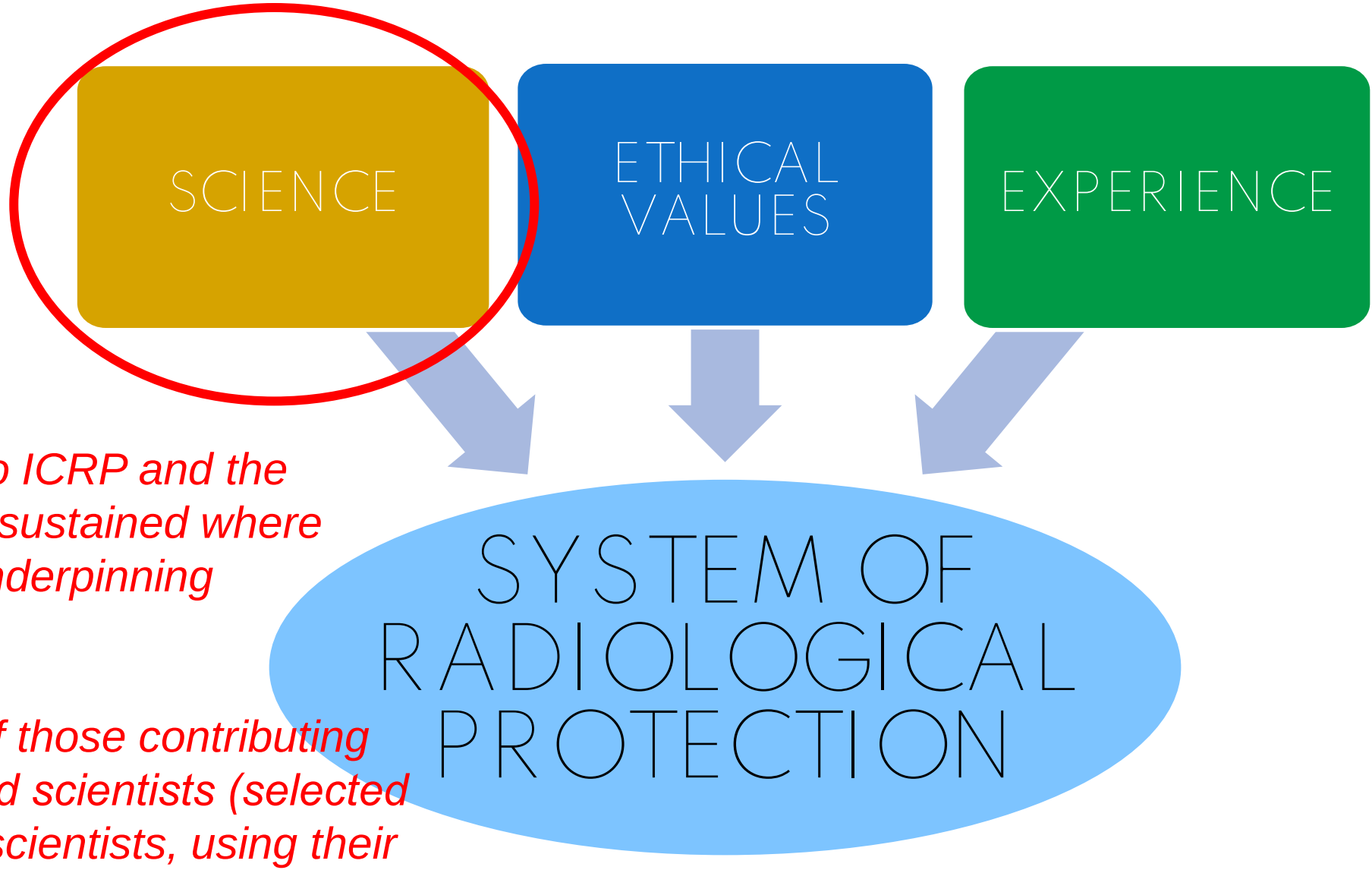
- **Long-term population studies** are undertaken to uncover associations between long term low dose radiation exposure and diseases

UKHSA and the international RP landscape

- UKHSA has **5 members on ICRP committees** 1, 3 and 4 and many other observers / TG members
- UKHSA's Deputy Director for Radiation, Simon Bouffler, is the UK representative to **UNSCEAR**
- We and others contribute to research and development of the system in a variety of additional activities with **IAEA, WHO, NCRP**…

ICRP committee 1

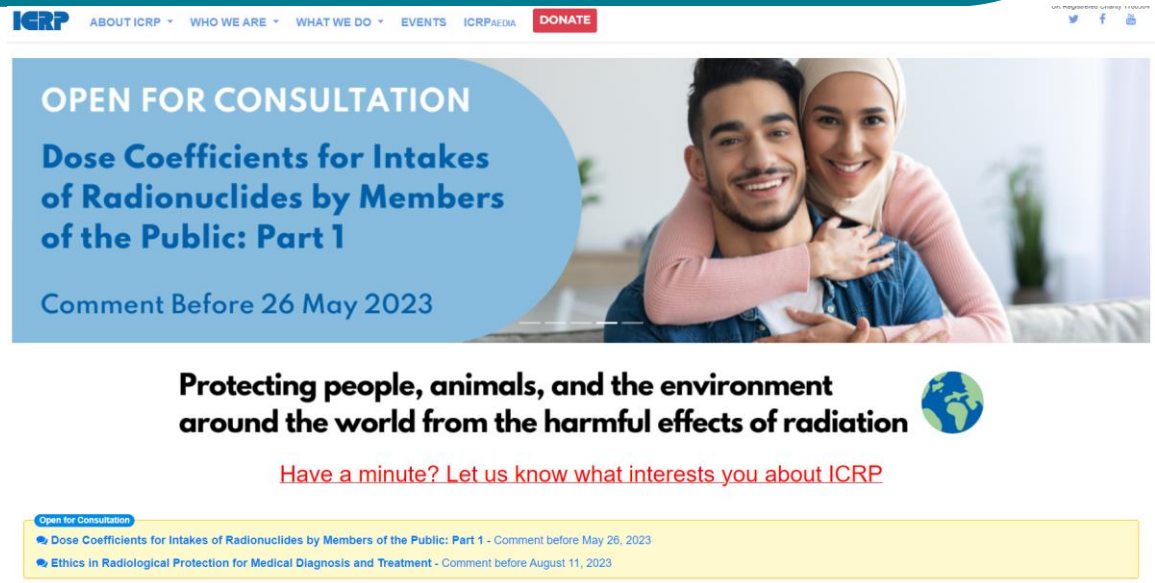
Role of the scientist in ICRP
Science and more



- *Science is fundamental to ICRP and the ethical basis can only be sustained where there is sound science underpinning recommendations*
- *The significant majority of those contributing to ICRP's work are trained scientists (selected to contribute to ICRP as scientists, using their knowledge and expertise in TG report development -> system*

The relationship between ICRP and the scientific sector

- Again, scientific understanding is, and must remain, the basis for the system
- ICRP is now clearly committed to openness and stakeholder involvement (Launch of the Review of the System, 2022, and Vancouver Call for Action)
- Practical implementation – workshops, information sessions early in TG development and towards the end; Open consultations; Presentations at conferences; Surveys…
- The international scientific community should take ICRP up on this!!



The relationship between ICRP and the scientific sector

Influence, cooperation

ICRP depends upon the pool of scientific expertise in the various sub-disciplines of radiation protection to drive its work; a number of scientific organisations are 'Special Liaison Organisations' these organisations are committed to support the work of ICRP, and provide views on topics as they develop*

Members of ICRP are **distinguished scientists known all over the world in their field, with additional focus on radiological protection*

Integrity

- *ICRP is an independent charity, a non-governmental organisation (NGO), which is different to UNSCEAR, IAEA etc…*
- *ICRP has a code of ethics (that is under revision), and is committed to openness and transparency in its work and operations*

How does/should ICRP benefit from scientific results on radiation protection?

- *ICRP draws from the global community of experts who bring a wealth of knowledge to the organisation, it reviews literature, and solicits input through consultation on documents*

- *The mentorship programme aims to build the global community of radiation protection scientific expertise. It co-ordinates in some project with the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), and documents from UNSCEAR are often used as a basis for ICRP work*

- *ICRP recognises the benefits of having a broad scientific consensus on which to base its conclusions and judgements*

How does/should ICRP benefit from scientific results on radiation protection?

- Close cooperation between ICRP and UNSCEAR is important
- UNSCEAR reviews the scientific basis and ICRP translates this into radiological protection recommendations
- Synergies are important (as resources are limited worldwide) and the work should not be doubled; ICRP and UNSCEAR should complement each other
- Example of collaboration between UNSCEAR and ICRP:

  Evaluation of diseases of the circulatory system from radiation exposure

  To avoid extensive overlap with an ongoing evaluation by the ICRP Task Group 119 (TG119) dealing with effects o ionising radiation on diseases of the circulatory system and their consideration in the system of radiological protection and unnecessary duplication of efforts, UNSCEAR and ICRP established an Informal Coordination Group (scheduled to meet on 5 May 2023 online)

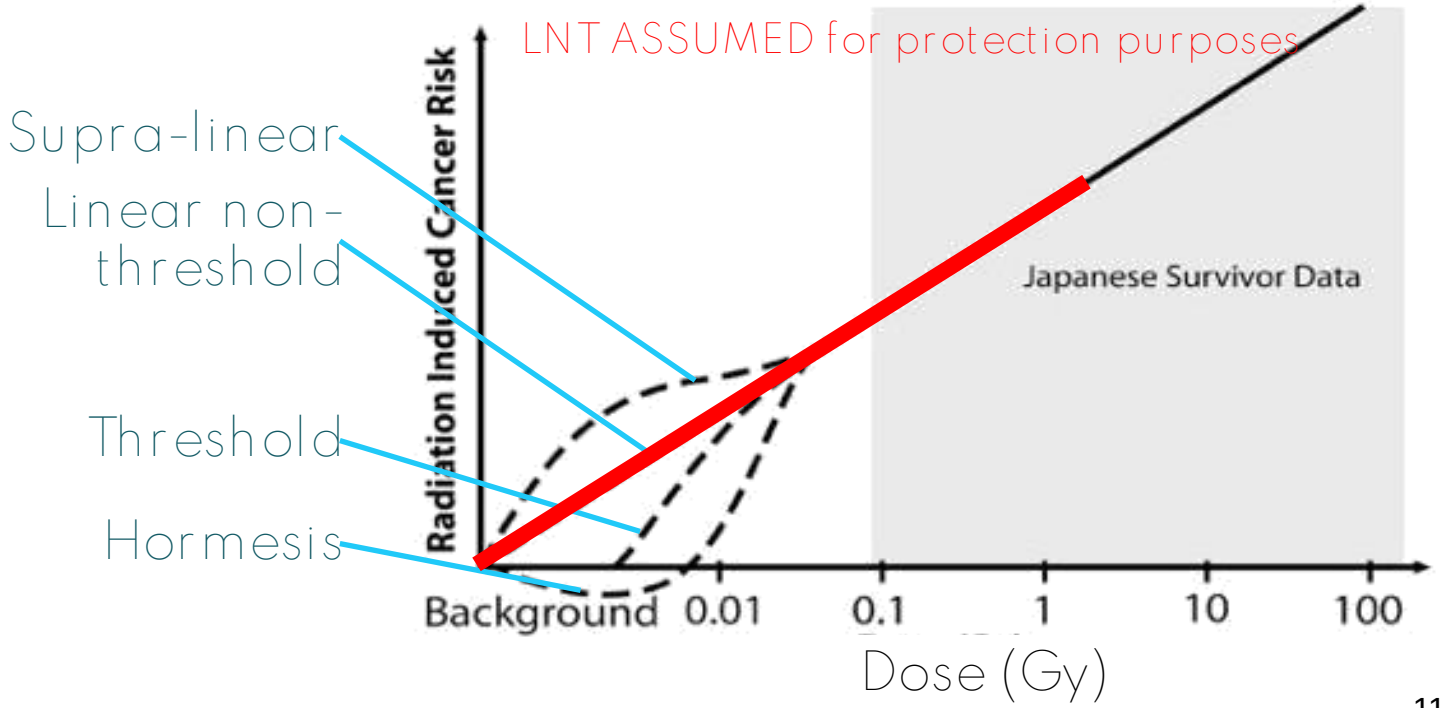
- Sometimes different views of UNSCEAR and ICRP… Radon

Scientific perspective on the role of ICRP
Cancer Risks at Low Doses

- Clear evidence of cancer at absorbed dose > 100 mGy
- Assume Linear No Threshold (LNT) dose-response at low doses (< 100 mGy) and dose rates (< 5 mGy / h) for protection purposes
- Experimental studies – biological plausibility

"…no alternative dose-response relationship appears more pragmatic or prudent for radiation protection purposes" NCRP Commentary No.27 (2018) Shore et al J. Radiol. Prot. 38, 1217-1233 (2018)

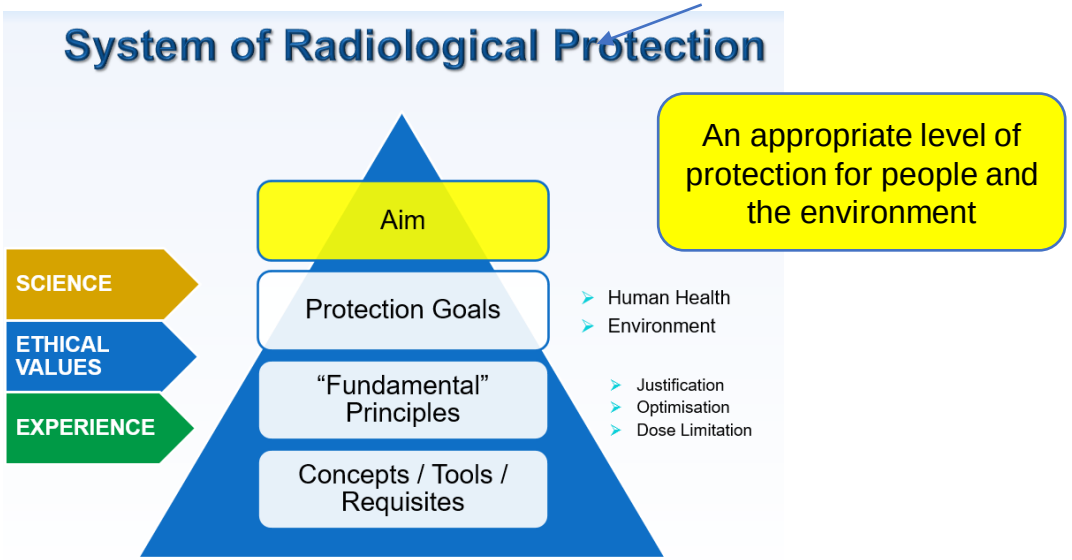
In low dose studies, some scientific data reported are relatively weak, controversial or simply difficult to interpret in the context of radiation protection… All sort of results indicative of the shape of the dose-response for specific end-points are reported!!

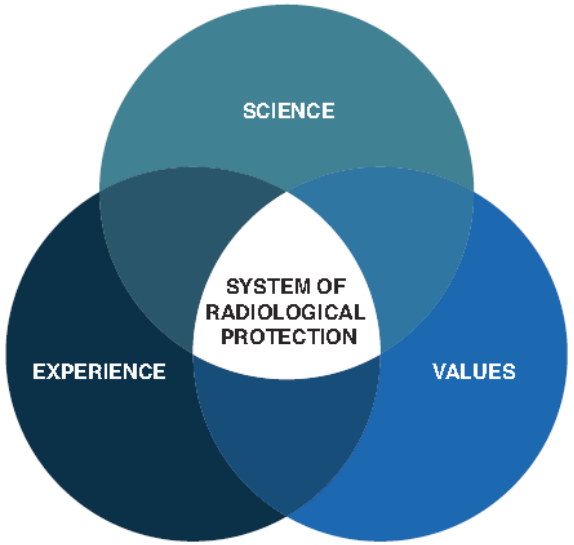


Published in: "Radiation Risks of Medical Imaging: Separating Fact from Fantasy"; Hendee and Ocorner.

What's needed next?

- ICRP strongly **benefits** from the full range of **multidisciplinary scientific results on radiation protection**
- New recommendations need to consider all the **ethical and societal aspects, experience**, as well as the **fundamental goals and principles**, and the available concepts and tools
- Above all, the recommendations need to be **easily understandable outside ICRP**, by practising RP professionals who won't necessarily be scientists, but reasoning should be clear to scientists!





Conclusions

- ✓ The role of the scientist **remains central to everything ICRP does and** scientific results **must be** the basis of the RP system
- ✓ But… The **evidence must be clear** to justify any change in the system
- ✓ The system must exist ***despite*** the uncertainties:

  it is clear that any scientific evidence will always be accompanied by uncertainties …

  e.g. transfer from animal data to human evidence, shape of the dose response for cancer, so a pragmatic approach is essential
- ✓ In the end ICRP must develop recommendations (the society expects us to do so even if the scientific evidence is weak) - Ethics comes into play, e.g., prudence...
- ✓ We need to continue to **work together as a community!**

Please do engage with ICRP on the various activities mentioned, to ensure the review of the system, and any new proposals, have a strong scientific basis!

Contacts

Thank you so much for listening

do get in touch:

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