

# ***Non-Cancer Effects: Science and Values Aspects of Protection Decisions***

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## Science and Values

- The CRPPH has been a pioneer in study of stakeholder involvement in RP decision making
- RP decisions in complex situations (e.g. post-accident, new installations, waste management) are informed by science but are broadly driven by social and value considerations
- Science and Values workshops are designed to better understand drivers
  - 1st S&V Workshop: Helsinki, Finland, Jan 2008
  - 2nd S&V Workshop: Vaulx de Cernay, France, Nov 2009
  - 3rd S&V Workshop: Tokyo, Japan, Nov 2012
- Workshop Format:
  - Plenary Sessions to present Science and Values aspects of 3 topics
  - 3 parallel breakout sessions to discuss topics in detail

## Common Topic

It was agreed that some continuity was needed for these workshops, thus one common topic was selected:

- 1st S&V: Circulatory Disease
- 2nd S&V: Radiation-Induced Vascular Effects
- 3rd S&V: Non-Cancer Effects

## Why do we care about the problem?

1. Existence of clear epidemiological evidence above 0.5 Gy for the radiation induced cardiovascular diseases (CD), at lower doses the evidence is inconclusive
2. Radiation induced CD may have significant impact on the morbidity and mortality
3. CD are currently not specifically addressed by the system
4. If change is made based on Japanese risk estimates and LNT, the detriment would increase 20 - 50%

## Moral Challenge?

- ICRP 9 (1966): ‘The mechanism of the induction by radiation of leukaemia and other types of malignancy is not known. Such induction has so far been clearly established after doses of more than 100 rads [1 gray], but it is unknown whether a threshold dose exists below which no malignancy is produced. [...] As the existence of a threshold dose is unknown, it has been assumed that even the smallest doses involve a proportionately small risk of induction of malignancies. [...] The Commission is aware that the assumptions of no threshold and of complete additivity of all doses may be incorrect, but is satisfied that they are unlikely to lead to the underestimation of risks’.
- Where are we now with deterministic effects, compared to 1966 for cancer?

## What are we doing now?

- Reinforcing scientific studies on the given subjects
- Increasing professional awareness of the issue
- Critically reviewing existing data/literature
- Challenging features of the current RP system in light of evolving science and value judgements
- Strengthen evidence database from epidemiological studies and research on mechanisms of CVD
- Policy implications of radiation induced CVD need to be given much more serious regulatory consideration

## Values Questions Regarding the RP System

- How much additional risk is suggested by new studies?
- Implication for the additional detriment due to these effects?
- Is evidence sufficient to require precautionary approach?
- Importance of consistency in approach given precedent of cancer risk regulation?
- How should this risk be taken into account in overall risk management?
- At what level is risk sufficient to warrant changes in current protection paradigm for workers and for the general public?

## Recommendations from S&V3

1. *'In order to ensure our ethical values fully apply we have to clarify the issue of the detriment due to deterministic effects'*. This must be achieved in close cooperation with experts from the radiation protection community and from all fields.

***'ICRP is recommended to have a Task Group on the detriment associated with deterministic effects. The time is approaching for having a review and a report on this issue'.***

2. Synthesis of available knowledge - in particular radiobiology inputs - is needed (more assistance from UNSCEAR would be helpful).
3. Need to maintain research efforts so as to provide more reliable answers (e.g. decrease uncertainties):
  - Improve understanding of mechanisms,
  - Improve epidemiology.
4. Efforts are still needed to find more ways to spread the message of ICRP recommendations in the context of the wider range of safety issues in daily life