



**Implications of the Implementation
of the Revised Dose Limit to
the Lens of the Eye:
The view of the IRPA professionals**

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The IRPA TG: objectives and methodology

- ▶ An IRPA TG was established to provide an assessment of the impact of the implementation of the ICRP revised dose limit for the lens of the eye, since there is significant interest and some concern by the RP professionals.
- ▶ Associated Societies (ASs) of IRPA were asked to provide views and comments on the basis of a questionnaire, by addressing 3 different Topics :

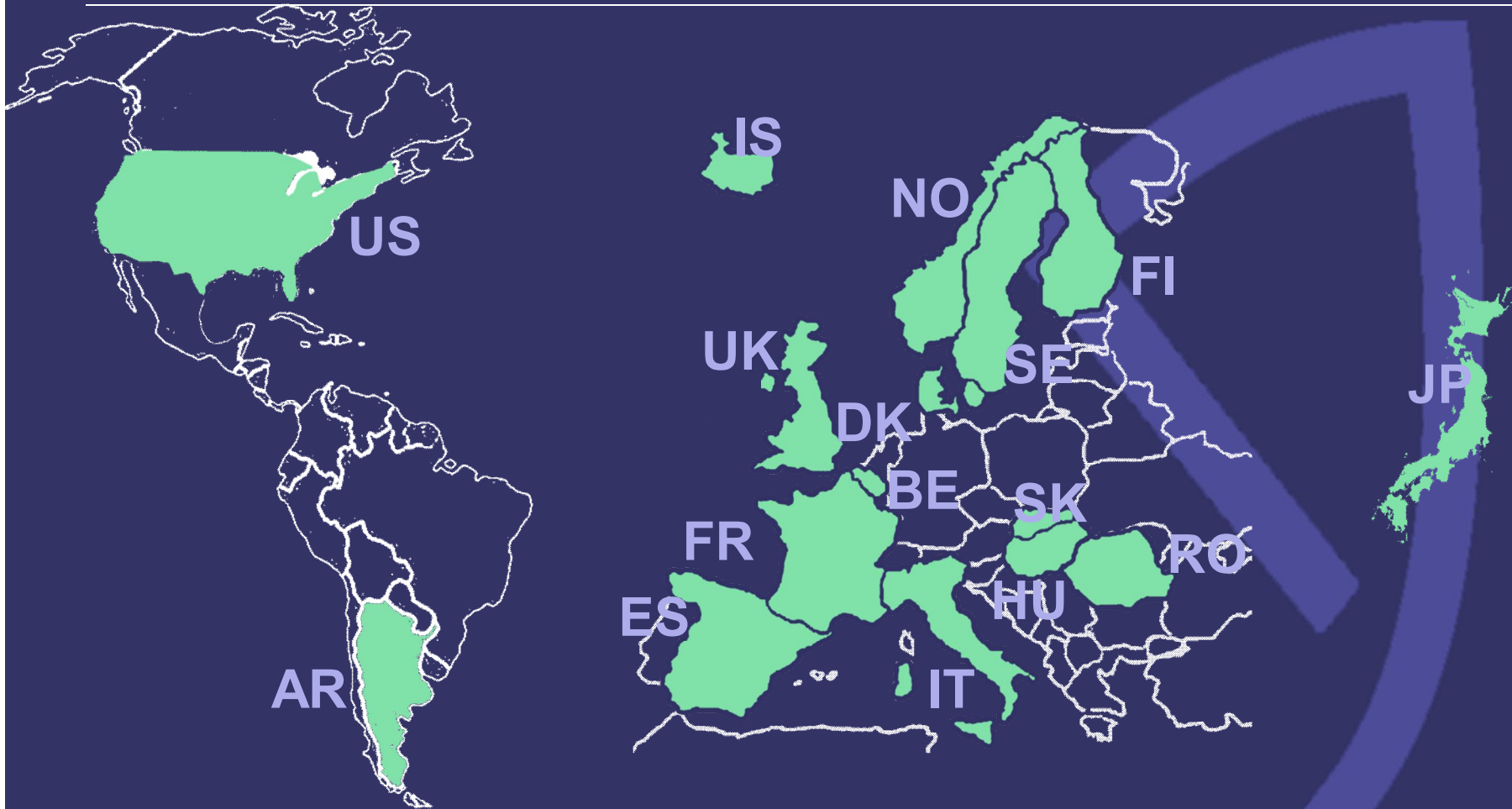
Implications for Dosimetry

Implications for Methods of Protection

Wider Implications of Implementing the Revised Limit



The questionnaire was circulated to all ASs within IRPA



Answers were obtained from 12 ASs, covering 16 countries, including most of the largest organisations, reporting input from Europe, North and South America as well as Asia.



General conclusions

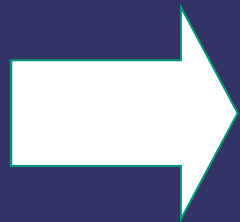
Specific conclusions

The responses indicate **various methods of approach and express different points of view.**

Considerable disparity found in the following aspects:

- ▶ **the cost** implication for the procedures aimed to reducing the dose to the eye;
- ▶ the implications related to the employment of people with **existing cataract or pre-cataract conditions**;
- ▶ the current perception of **future compensation claims** related to the new eye limit.

Since choices and decisions will remain within each country



useful to have further interchanges aimed at achieving a better understanding of the various aspects considered in this report.



General conclusions

Specific conclusions

Field of impact

- ▶ A broad consensus that the main impact of new limit will be in medical sector (interventional radiology and cardiology).

Eye lens dosimetry

- ▶ The relationship between dose and cataract formation is not well understood and the causality should be clarified.
- ▶ There is a need for international recommendations to ensure harmonisation of RP criteria.
- ▶ Agree a standardised system of dose recording (double-dosimetry system, or single badge) with appropriate empirical formula to record $H_p(10)$ and $H_p(3)$.
- ▶ Arrangements for assessing and recording the total eye lens dose of itinerant workers.



General conclusions

Specific conclusions

Protection of workers

- ▶ Established RP techniques and shielding devices to reduce lens dose are available to all ASs, **but used sporadically.**
- ▶ Training for effective and consistent use of techniques is a significant hurdle and **funding of training is important.**
- ▶ The application of methods of protection varies considerably from one location to another, even in the same country and **explicit guidelines relating to the use of methods of protection would be useful.**
- ▶ **The mandatory use of eye protection should be considered for all exposed workers.**



General conclusions

Specific conclusions

Wider Implications

The new limit could affect current methods of working, — employment issues, high costs for possible additional medical eye examinations, possible increases in compensation lawsuits, how to answer queries on previously unrecorded doses (below current dose limits, but possibly above the new ones)

Significant concern and confusion exist among radiation practitioners on the rationale of changing the dose limit.

- ▶ Why fatal and non-fatal effects are seen in a similar way ?
The evidence to support this change is not linked to harm.
- ▶ The work of the international organizations (ICRP, IAEA) on this topic seemed to be done in a hurry, with an inadequate period of consultation.



General conclusions

Specific conclusions

It was felt that the case for the revised dose limit should be made more visible to the practitioners.

Potential Cost implications

Most ASs had some concerns over the implied costs for:

- ▶ Additional training
- ▶ Additional dosimetry
- ▶ Additional shielding
- ▶ Possible need to formally classify more worker
- ▶ Possible need for extra staff if current specialist staff are reaching the dose limit
- ▶ Enhanced medical eye examinations for workers



General conclusions Recommendations

Specific conclusions

Understanding and Guidance

- ▶ Further studies on the relationship between radiation exposure of the lens of eye and the cataract formation.
- ▶ Further explanation about using the same numerical dose limit for a non-fatal deterministic as for fatal stochastic effects.
- ▶ Further study for an international protocol for monitoring doses to the lens: IRPA Executive Council should promote it
- ▶ Guidelines to correctly identify workers who could be exposed to lens doses close to the limit.
- ▶ Guidance, provided by regulators, to assist the implementation of the introduced changes.



General conclusions Recommendations

Specific conclusions

Practical aspects

- ▶ Need for a new system for detecting and reporting cataract data or need for clear comparison of existing systems.
- ▶ Further investigation on validity and limitation of a whole body dosimeter (at collar above apron) to assess $H_p(3)$.
- ▶ Further investigation on the effectiveness of the common protection methods (lead glasses and screens), and dissemination of the results via training sessions.
- ▶ Since certain designs of glasses provide insufficient shielding for scattered radiation, they should be redesigned.
- ▶ To ensure that dosimeters and protective equipment are comfortable to use and do not significantly interfere with effectiveness of the medical procedures.



General conclusions Recommendations

Specific conclusions

Social, economic and management considerations

- ▶ Need to **better detail the costs**, showing the additional costs incurred in comparison with the total costs of the procedure and the overall costs of installation.
- ▶ Need to **address training** on the use of protective equipment, increasing awareness about effectiveness and correct wearing of relevant dosimeters.
- ▶ Need to define **procedures relating to the employment of people with existing cataract or pre-cataract conditions**:
 - a)** the risk of discriminating people seeking employment, on the basis of a common condition;
 - b)** the risk of inducing addition deterioration of visual acuity for exposed workers.



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