



INTERNATIONAL PROJECT ON INDIVIDUAL MONITORING AND RADIATION EXPOSURE LEVELS IN INTERVENTIONAL CARDIOLOGY

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The IAEA ISEMIR project

- Arising from the **IAEA Occupational Radiation Protection Action Plan**
 - Information System on Occupational Exposure in Medicine, Industry and Research (**ISEMIR**).
- Set up in January 2009 for a 3 year period.
Interventional cardiology one of the selected areas.



The screenshot shows the IAEA.org website header with the logo and navigation links: About Us (Who We Are), Our Work (What We Do), and News Center (Latest from IAEA). The main content area is titled "Nuclear Safety & Security" and includes a sidebar with a home icon and links to "Nuclear Safety & Security", "Safety & Security Framework", "Technical Areas", "Services for Member States", "Safety & Security Publications", and "Conventions & Codes". The main content features the title "Occupational Radiation Protection Action Plan" in red, followed by a "Purpose" section. The purpose text states: "The first International Conference on Occupational Radiation Protection, hosted by the Government of Switzerland, was held in Geneva from 26 to 30 August 2002. It was organized by the IAEA, which convened it jointly with the International Labour Office."



WG on Interventional Cardiology – aims

- World-wide overview of occupational exposures in IC
- Harmonization of staff monitoring in IC
- Establish a system for regular collection of occupational doses in IC (**International database**).

- **Questionnaires** on present status of individual monitoring and doses in IC
 1. Interventional cardiologists (Individuals)
 2. Interventional cardiologists (Chiefs)
 3. Regulatory Bodies



Interventional cardiologists

- Responses from 45 IC facilities (Chiefs).
From **24 countries**.
- Individual interventional cardiologists (201):
responses from **32 countries**.
 - **76%** claimed that they always used their dosimeter and 45% stated they always used 2 dosimeters.
 - Interventional cardiologists. **83%** claimed to have had RP training.



Results from the survey probably give an over-optimistic picture

Regulatory bodies

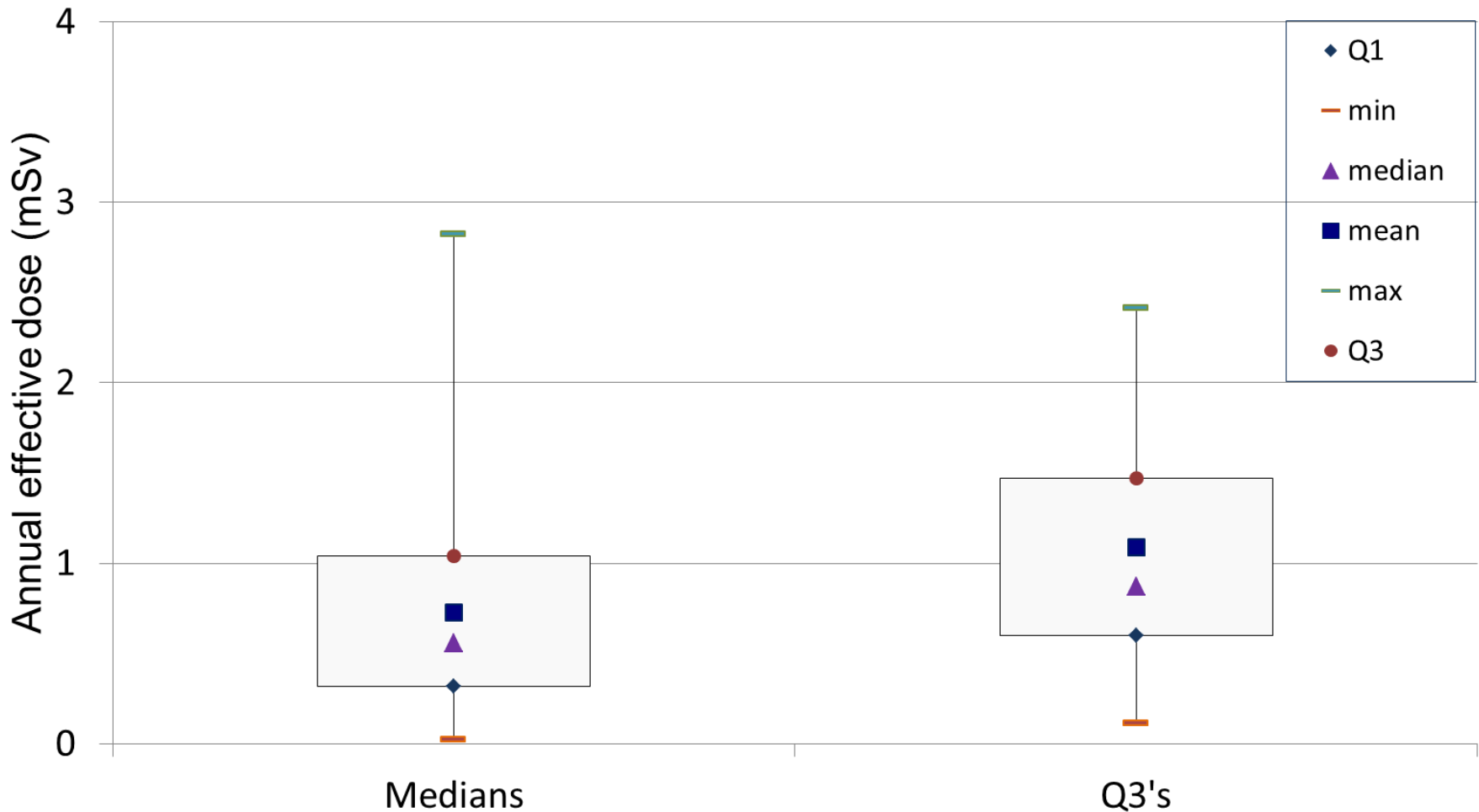
- 81 answers: 24% world population
- Less than 40% had good data on occupational doses in IC:
 - No central dose register
 - Data available, but sometimes, not “useful”
 - No specific classification for IC
 - Mixed corrected & uncorrected doses
 - Only doses above some action level



Poor availability of good data from RBs

Reported doses for 2008: 23 Countries (RBs with data form 1432 IC physicians)

Country median & third quartile annual effective doses for IC physicians in 2008



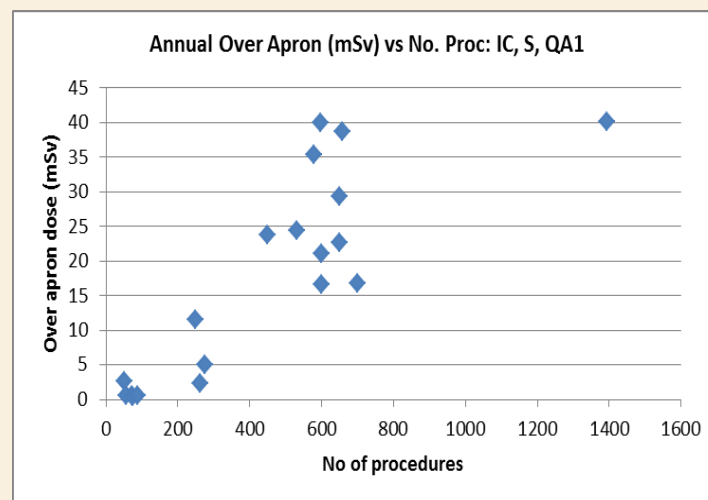
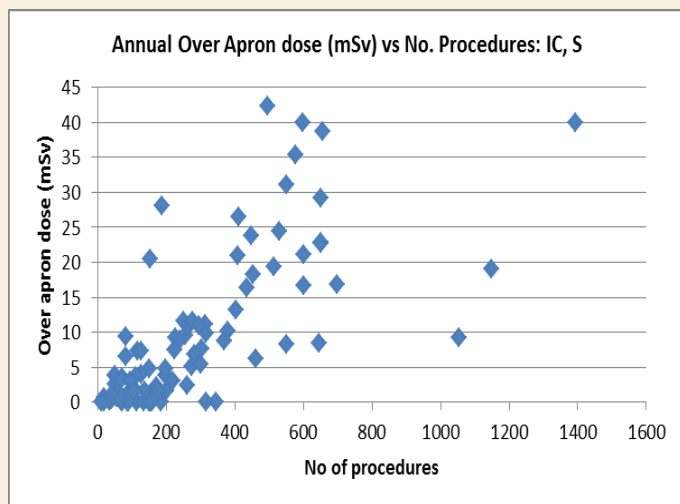
Why might these be an under-estimate?

- Interventional cardiologists **may not wear their dosimeter(s) all the time**



Quality of dose data: 20 hospitals in 15 countries provided staff dose data and individual workloads in the 2010 multinational survey

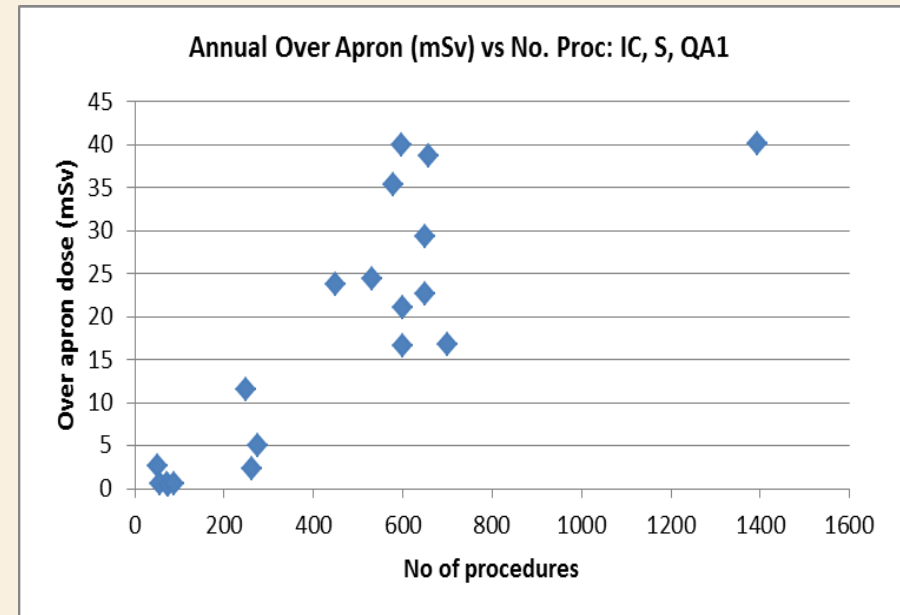
- Criteria to identify “good quality” doses:
 - Dose reporting consistency (>75% data available)
 - Dose value consistency (SD of doses < 50%)
 - Over apron nurse doses exhibit better quality: much less rejection rate



**Large number of dose values rejected (80% in the example).
“Good quality” doses show expected relationship with workload**

Eye lens exposure of ICs

- Over apron $H_p(10)$ are frequently used as a good estimation of the eye lens doses
- Good quality data are showing a great fraction of ICs are receiving doses over the recently recommended ICRP limit.



ISEMIR – an international database

- A tool for optimization of occupational RP
- Based around individual IC facilities
 - Individual personnel in IC facility:
 - Occupational doses
 - Workloads
 - Individual attributes that might influence occupational dose – e.g. RP training, role, RP habits
- Analysis of occupational dose per procedure
- Bench-marking
 - IC facility's performance versus other facilities
 - Individuals within an IC facility versus other individuals



Summary

- ISEMIR project has shown:
 - Significant occupational doses (including eye doses) do occur in IC
 - Current monitoring data are of poor quality
 - A worldwide need for better implementation of optimization of protection
- ISEMIR international database is being developed
 - A tool for implementation
 - Participation is encouraged

