IAEA Quality Audits in Radiotherapy

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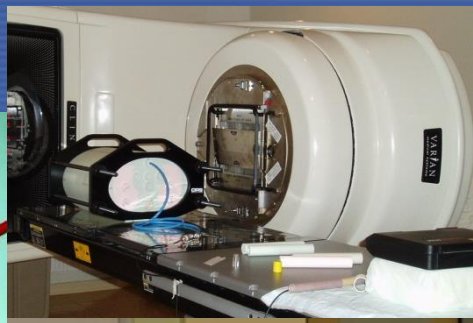
IAEA audits in radiotherapy

- **SINCE 1969:** IAEA/WHO TLD postal dose audits of radiotherapy beam calibration (>40 years of operation):

  126 countries, ~1850 hospitals, >9000 beams
- **SINCE 1981:**

  TLD audits for ~70 SSDLs
- **SINCE 2005:**

  Quality Assurance Team for Radiation Oncology (QUATRO)
- **NEW:** TPS audit



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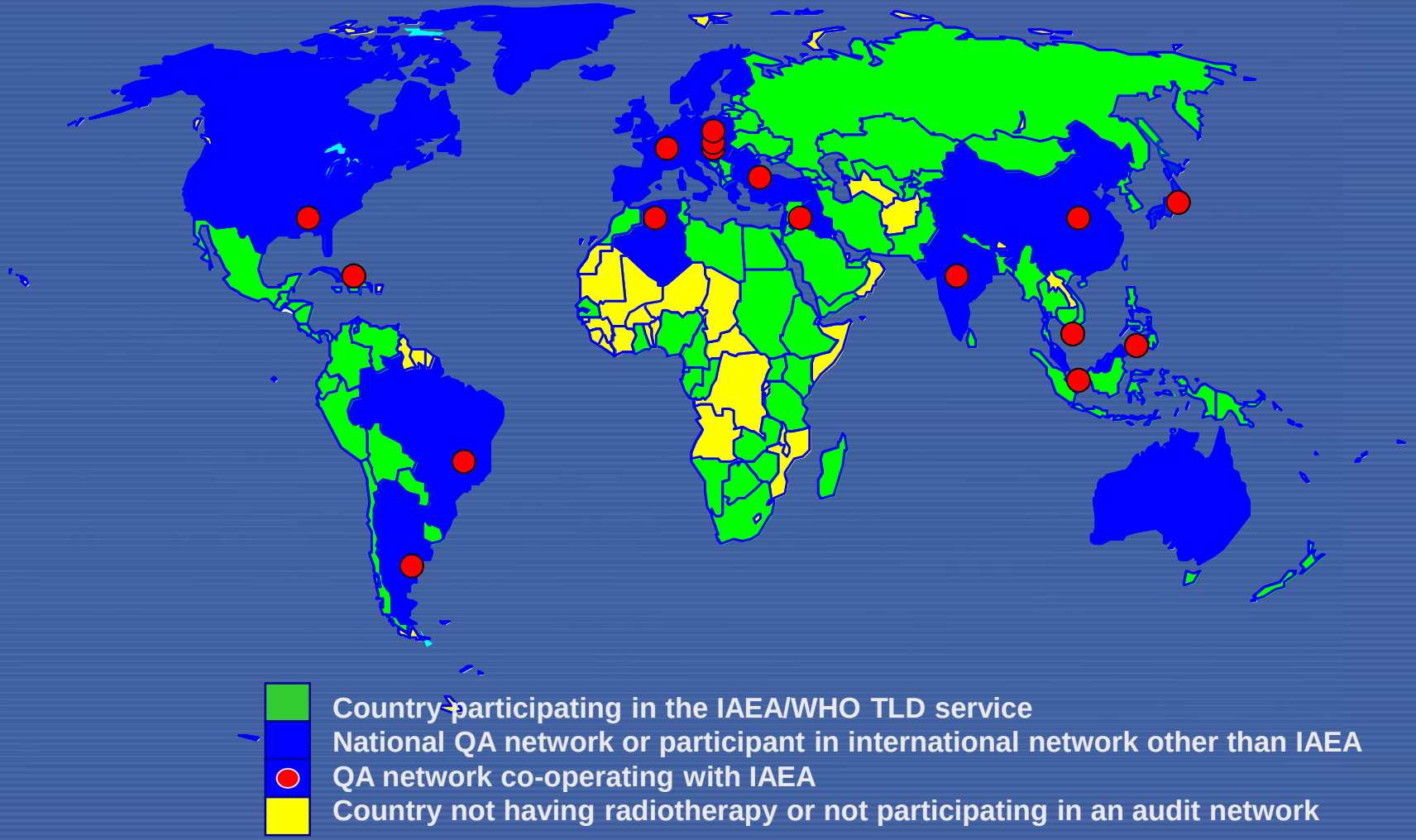
Dose audit networks for radiotherapy



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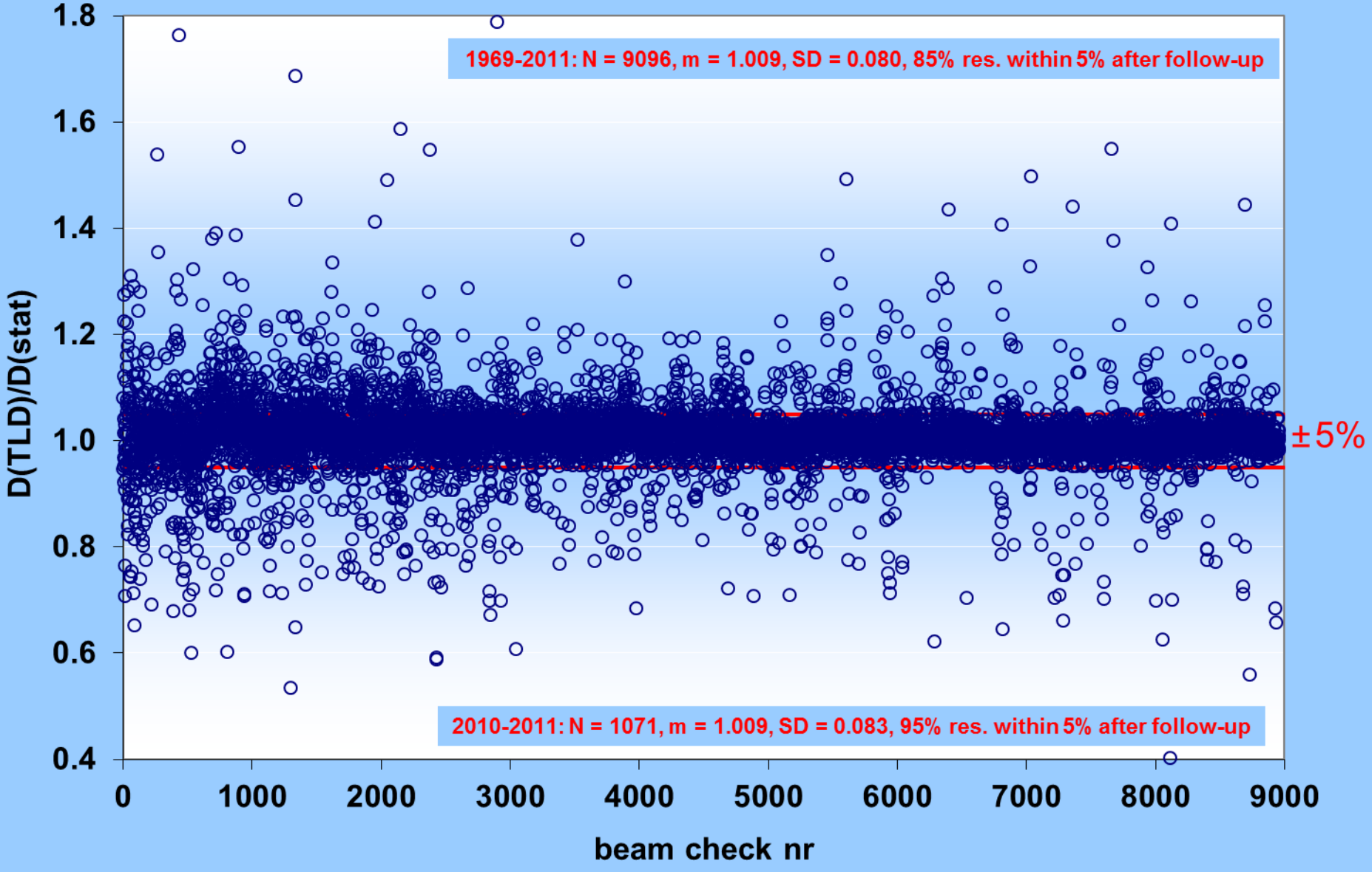
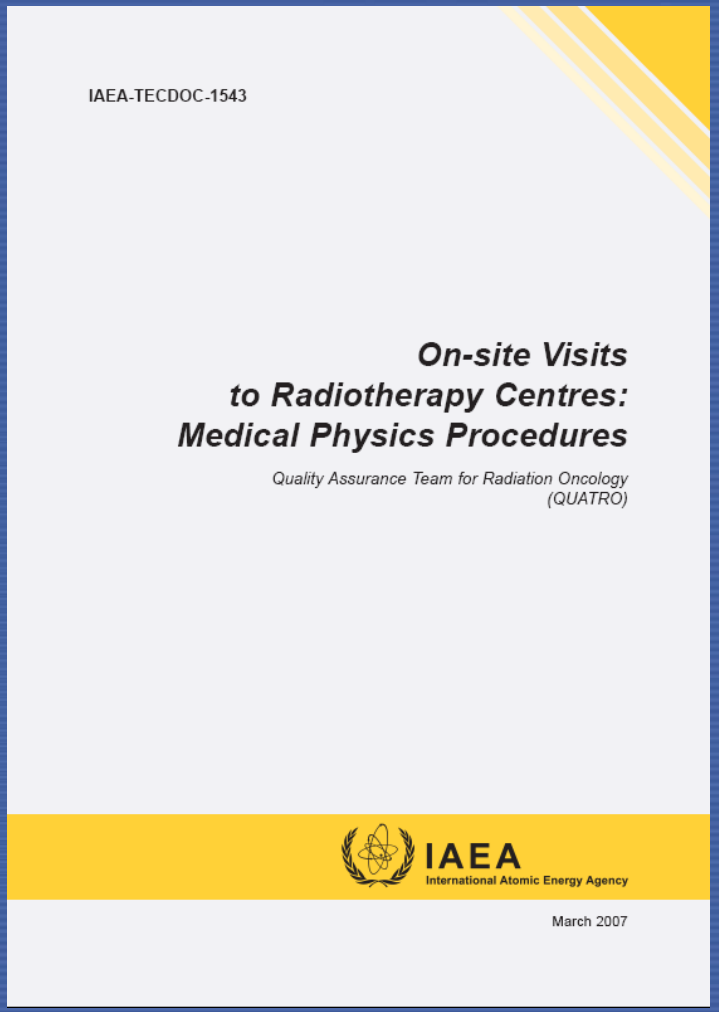
IAEA/WHO TLD results for Co-60 and high energy X rays 1969-2011



Follow-up of poor TLD results

The IAEA dosimetry travel kit used for QA missions to radiotherapy hospitals



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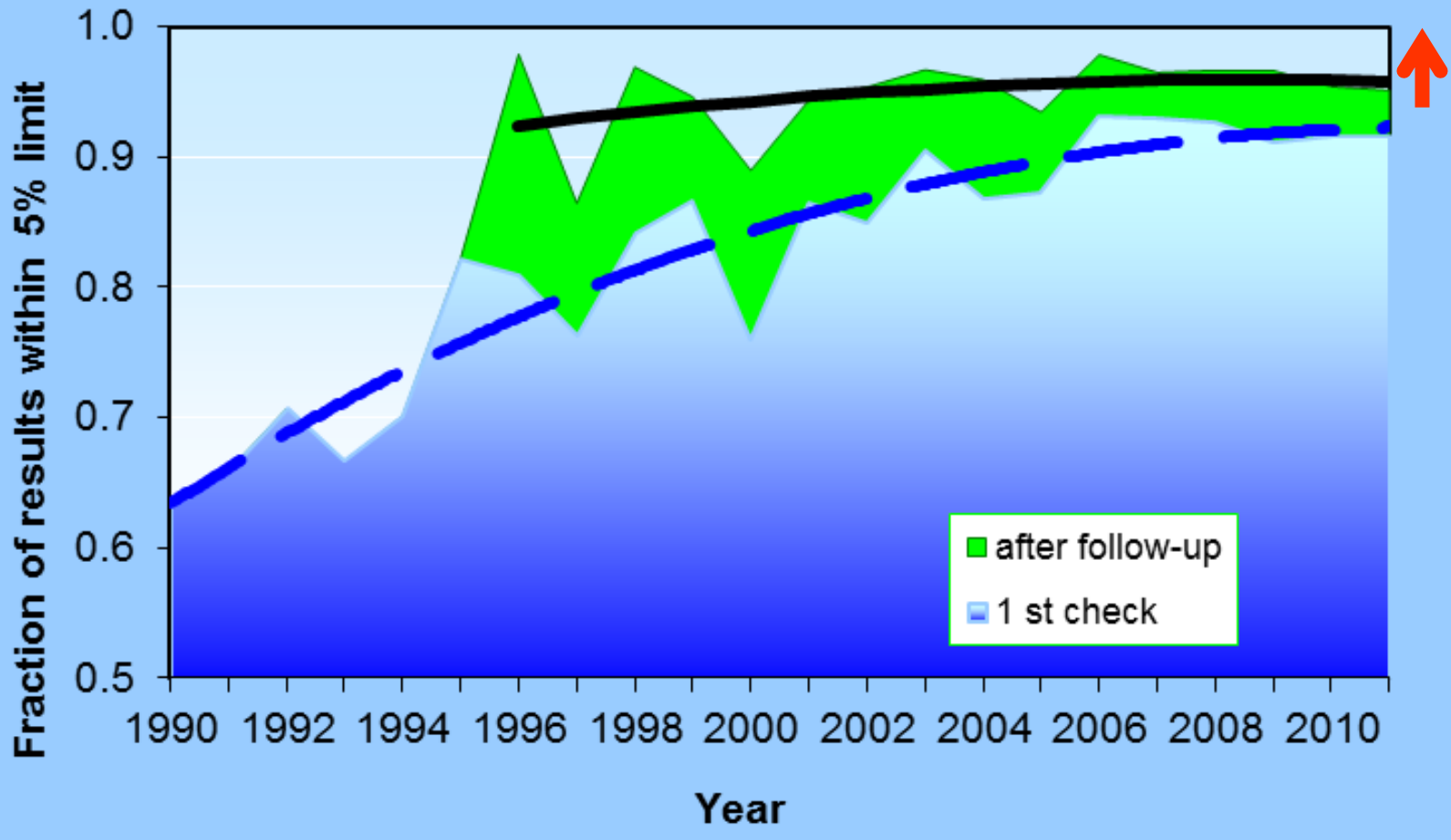
TLD results within the 5% limit (1)



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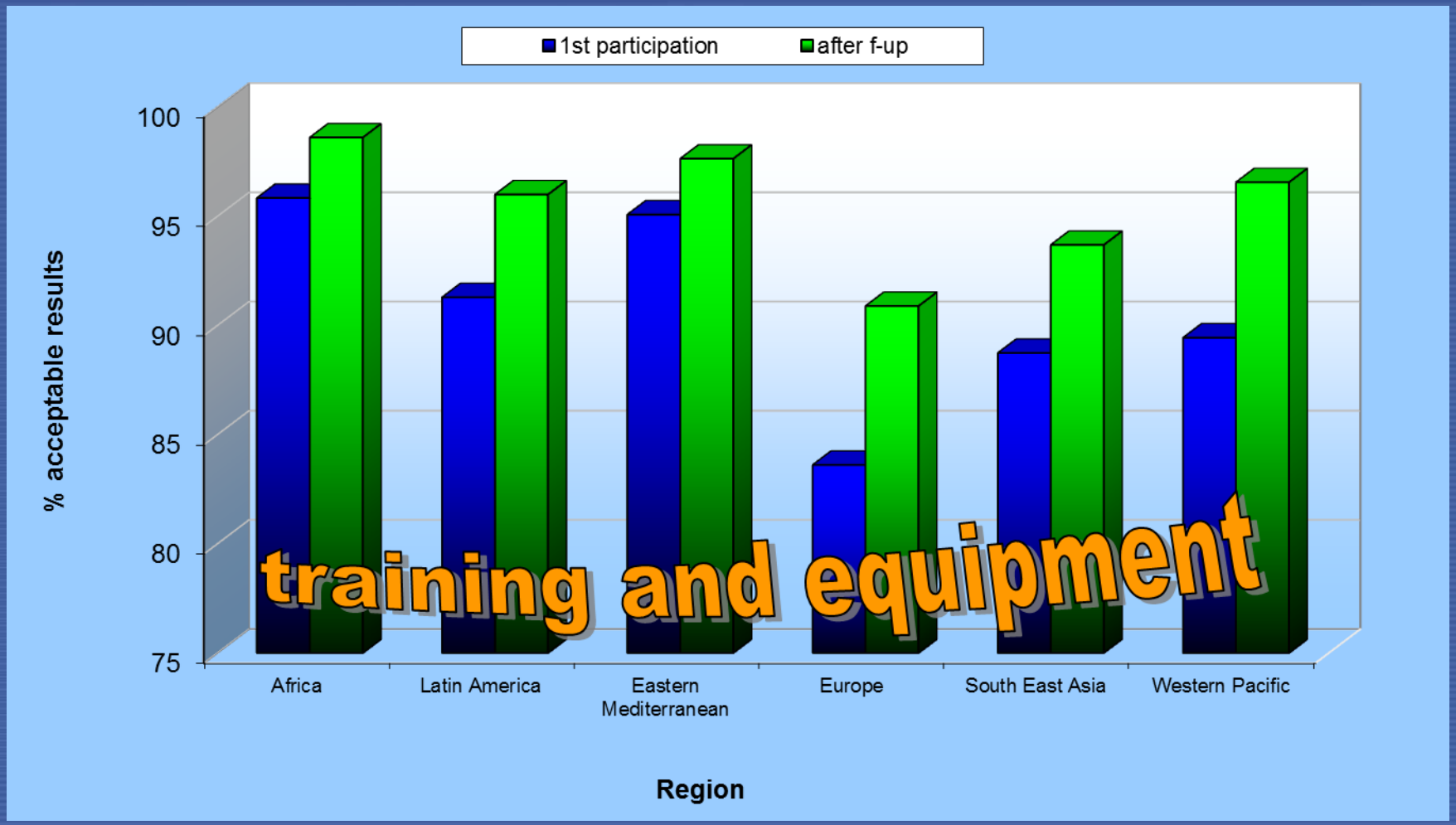
TLD results within the 5% limit (2)



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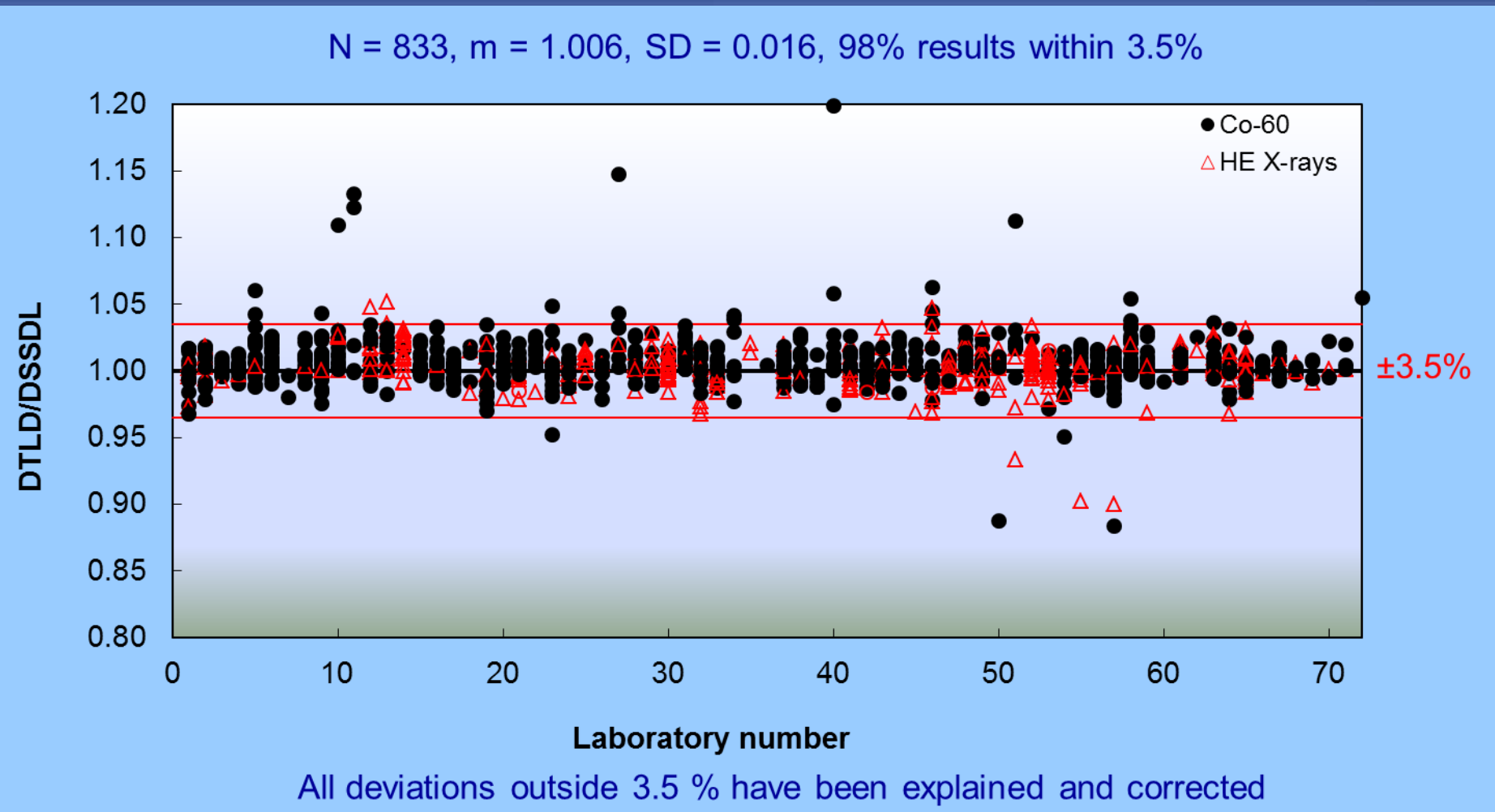
In 2000-2011, 5491 beams were checked with 538 TLD results followed-up (EU ~ 47%, AM ~ 25%, WP ~ 14%)

TLD results for SSDLs: 2000-2011



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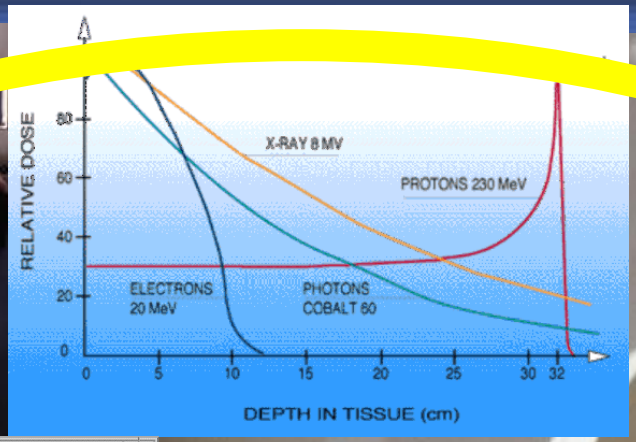
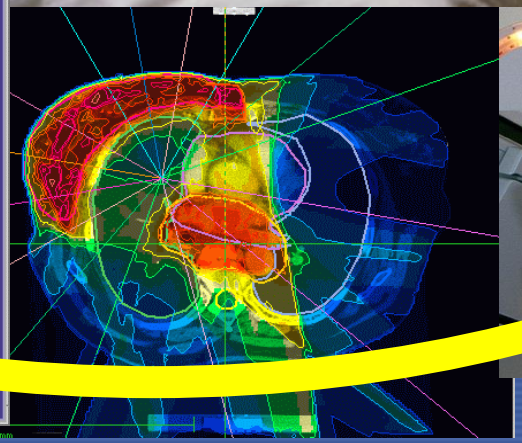
Comprehensive RT audit: QUATRO





On-site audit procedures

- Typically 5 days per RT department
- Entrance briefing
- Assessment: complete tour of facility, staff interviews, review & evaluation of procedures and documentation, measurements, tests of procedures, observation of practical work
- Exit briefing: feedback to the department, preliminary recommendations, questions, discussion.

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QUATRO audits: summary

- Regional workshops have been organised to train auditors
- So far more than 70 missions have been conducted and more are planned
- Most audits have been in Europe
- QUATRO Audit assessed adequacies in:
  - Infrastructure
  - Patient related procedures
  - Equipment related procedures
  - Training programmes
  - Staffing

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Recommendations by QUATRO

- Support staff continuous education
- Strengthen QA programmes and procedures
- Equipment: get more, use better
- Increase staffing level: MP, RO, RTT
- Better trained staff: RTT, RO, MP
- Improve treatment protocols
- Improve structure and organization of cancer centres

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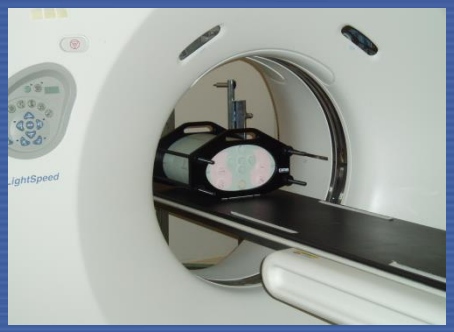
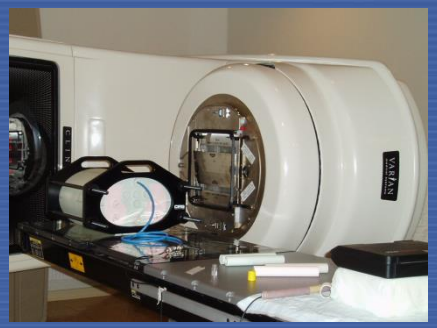
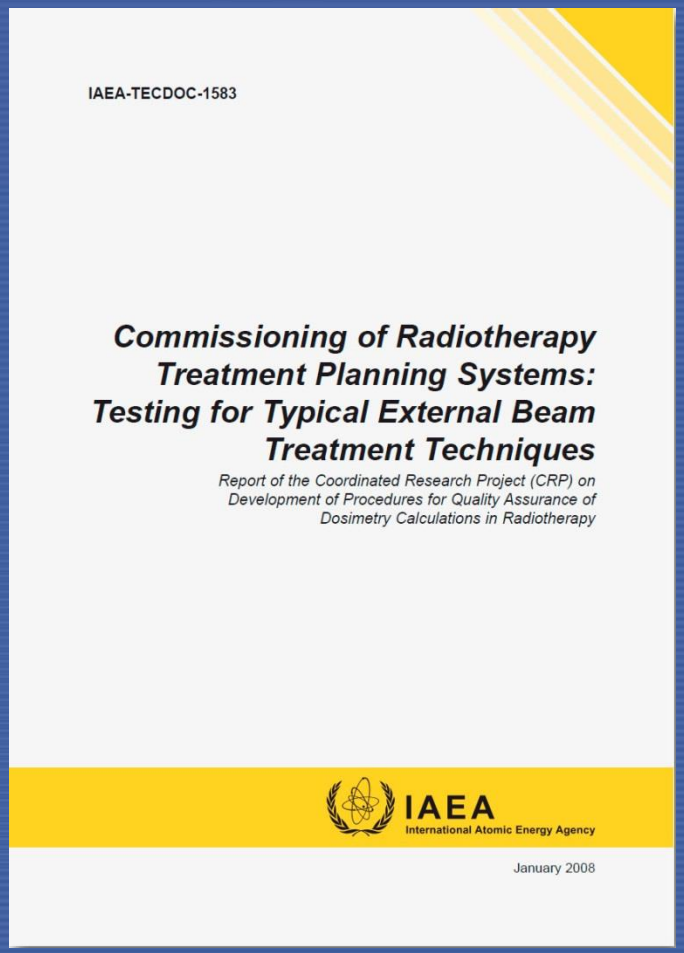
New IAEA procedures: TPS audit





Set of practical tests for dosimetry calculations reflecting typical treatment techniques in a radiotherapy department



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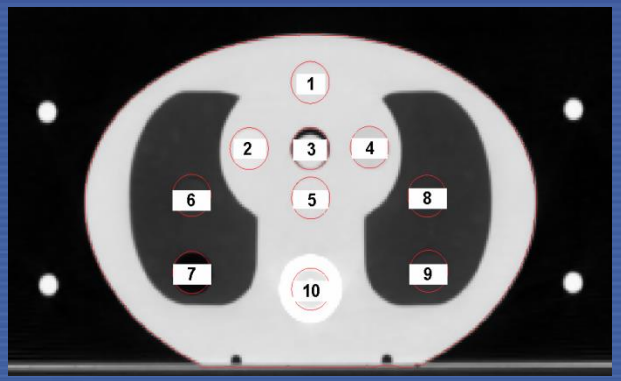
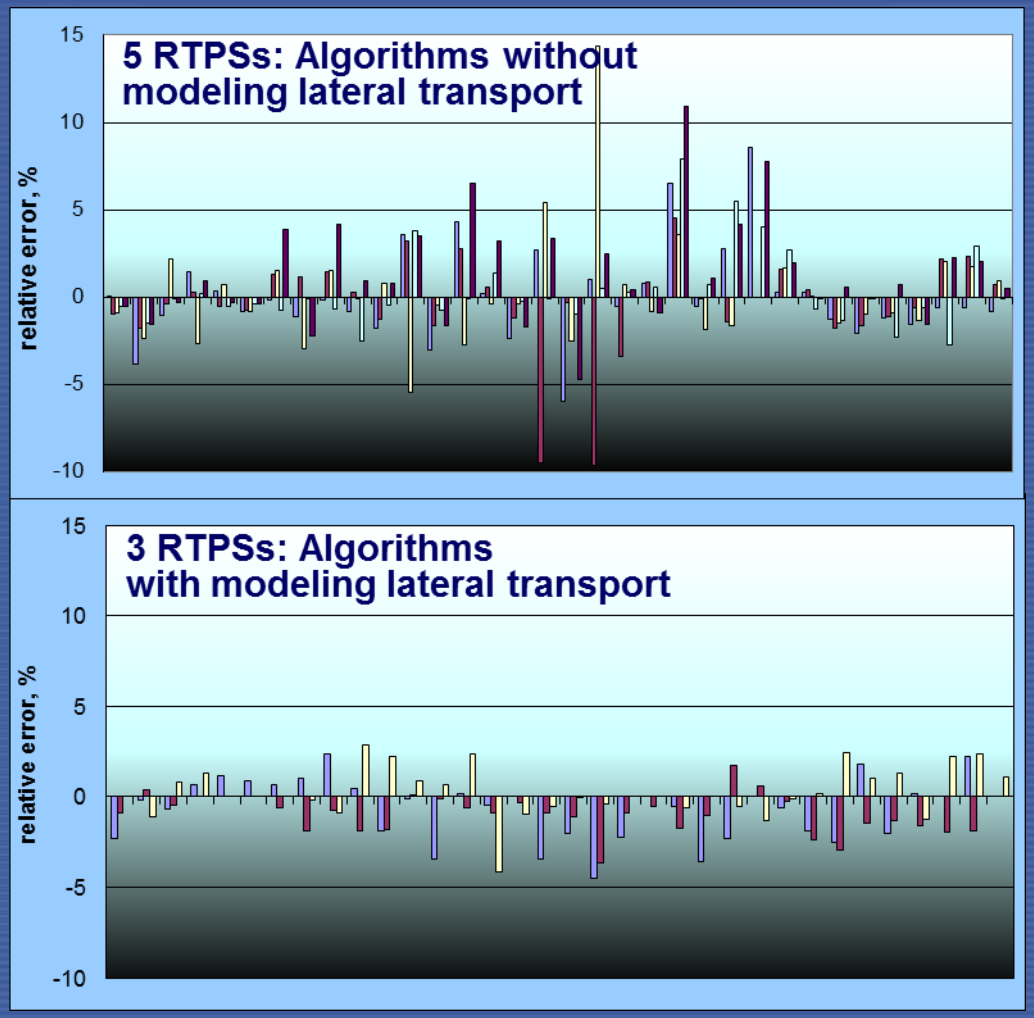
Implementation of TPS audit





Steps in implementation of TPS audits:

1. IAEA multicentre pilot study
2. TPS test audit runs in Baltic countries and Hungary
3. National TPS audit exercises supported by IAEA (Europe)

TPS audit package is available from IAEA on request.

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Conclusion

- The IAEA/WHO TLD audits contribute to the improvement of the status of radiotherapy dosimetry worldwide
- QUATRO is a useful tool for peer reviewing radiotherapy practices; it documents weak links in hospital operations and procedures, and offers recommendations to address them.
- TPS audits help the physicist appreciate limitations of treatment planning systems and the importance of independent verification of plans before treatment.

RESULT: QUALITY IMPROVEMENT
SAFETY FOR PATIENTS

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