Bridging science and global cancer

Werner Burkart, Prof. Dr.
Deputy Director General
Head, Department of Nuclear Sciences and Applications

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IAEA
International Atomic Energy Agency

The IAEA Mission

“Atoms for Peace”

Maximizing the contribution of nuclear technology to society, while verifying its peaceful use

Three pillars:

- Safeguards & verification
- Safety & security
- **Science & technology**

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Department of Nuclear Sciences & Applications

Contributing to sustainable development through the use of nuclear sciences and their applications

- **Human health**
  + **Programme of Action for Cancer Therapy** (with WHO)
- Food and agriculture (with FAO)
- Water resource management
- Protection of marine and terrestrial environment
- Industry

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Human Health Programme

Enhancing capacity of Member States to meet human health basic needs using nuclear sciences

- **Education** in nuclear sciences applied to human health
- Coordination of **research** projects
- **Quality assurance** and dosimetry services in radiation medicine

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Human Health Programme

- **Education:**
  Building capacity in nuclear knowledge for human health *(train the trainers, seminars, workshops, international/regional conferences, teaching materials, technical and scientific publications)*
- **Coordinated research:**
  Organising Coordinated Research Projects in Member States *(some including PhD grants)*
- **Services to Member States:**
  Providing dosimetry, QA of equipment and good practice of medical imaging and radiotherapy

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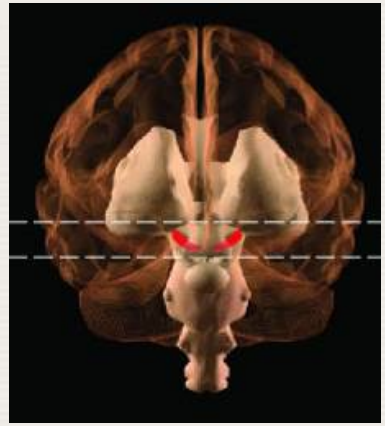
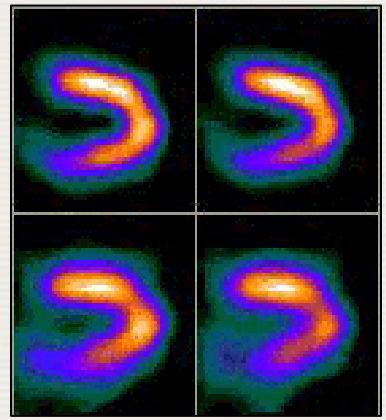
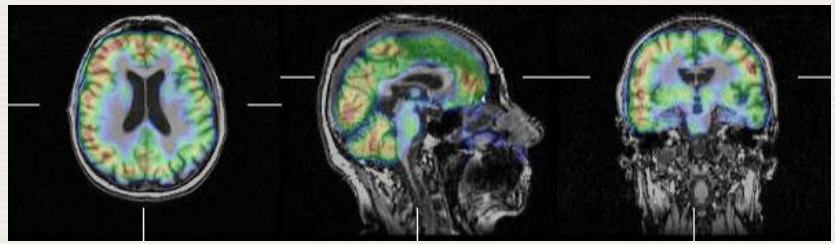
IAEA Radiation Medicine in Human Health

- Communicable diseases
- Non-communicable diseases:
  - **Cancer**
  - Cardiovascular
  - Musculoskeletal
  - Metabolic







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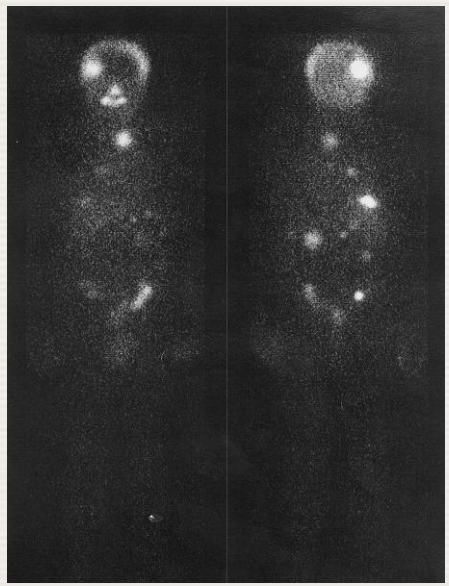
Nuclear Medicine and Medical Imaging

Nuclear Medicine

Diagnosis

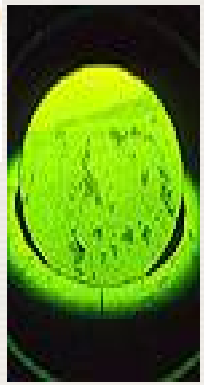
Oncology
Cardiology
Neurology

Therapy



Laboratory

Tumor markers
Molecular biology
Gene expression



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Role of Radiation Medicine in Cancer Management

DIAGNOSIS

CLINICAL ASSESSMENT

STAGING PROGNOSIS

TREATMENT

FOLLOW UP

CT
PET
NM

CT
MRI
US
XRay
NM
PET

Chemotherapy, Radiotherapy, Surgery

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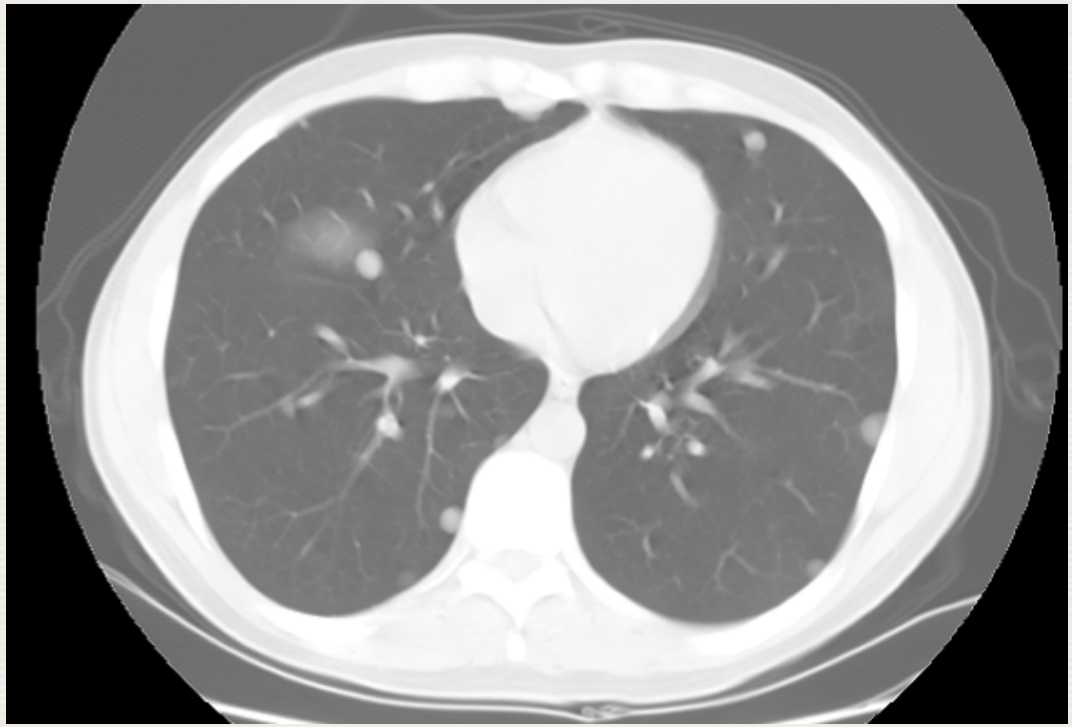
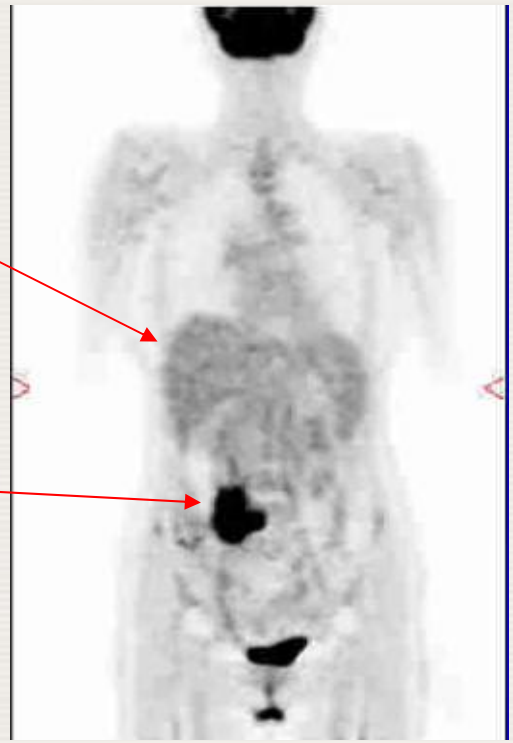
Role of Radiation Medicine in Cancer Management:
Staging



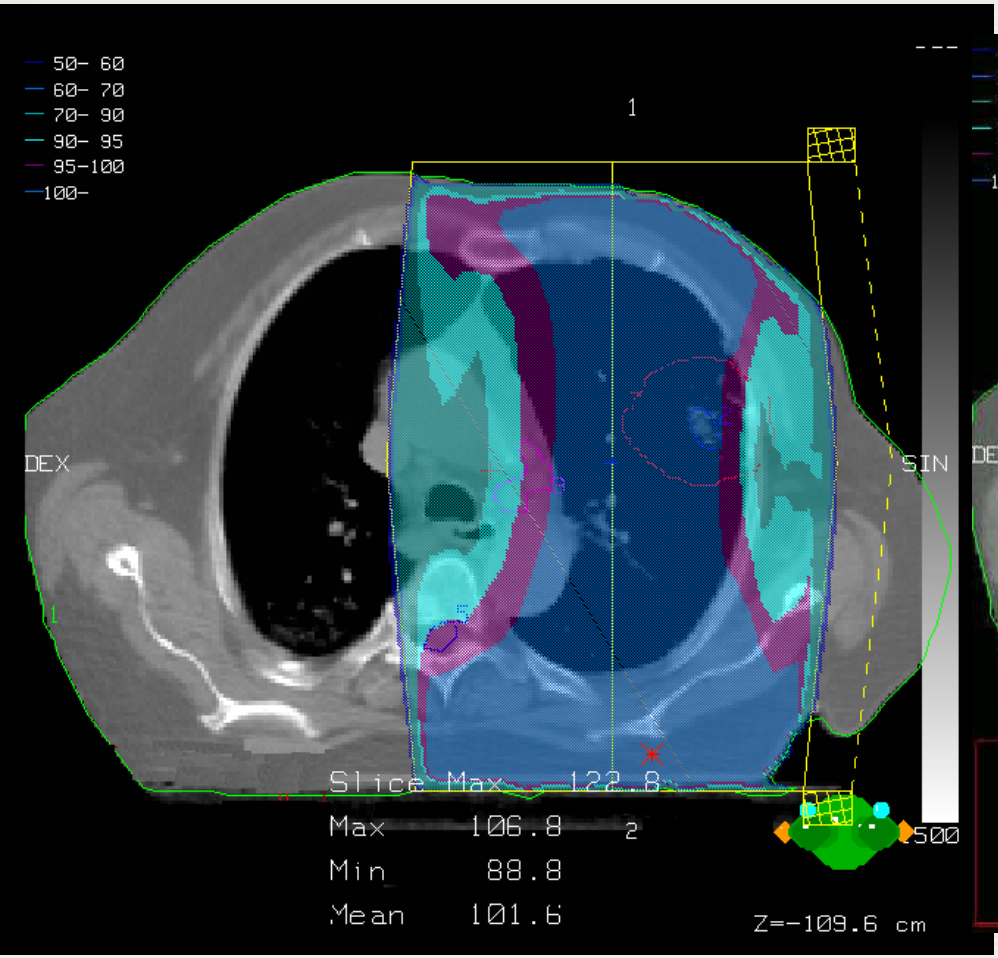
Metastases

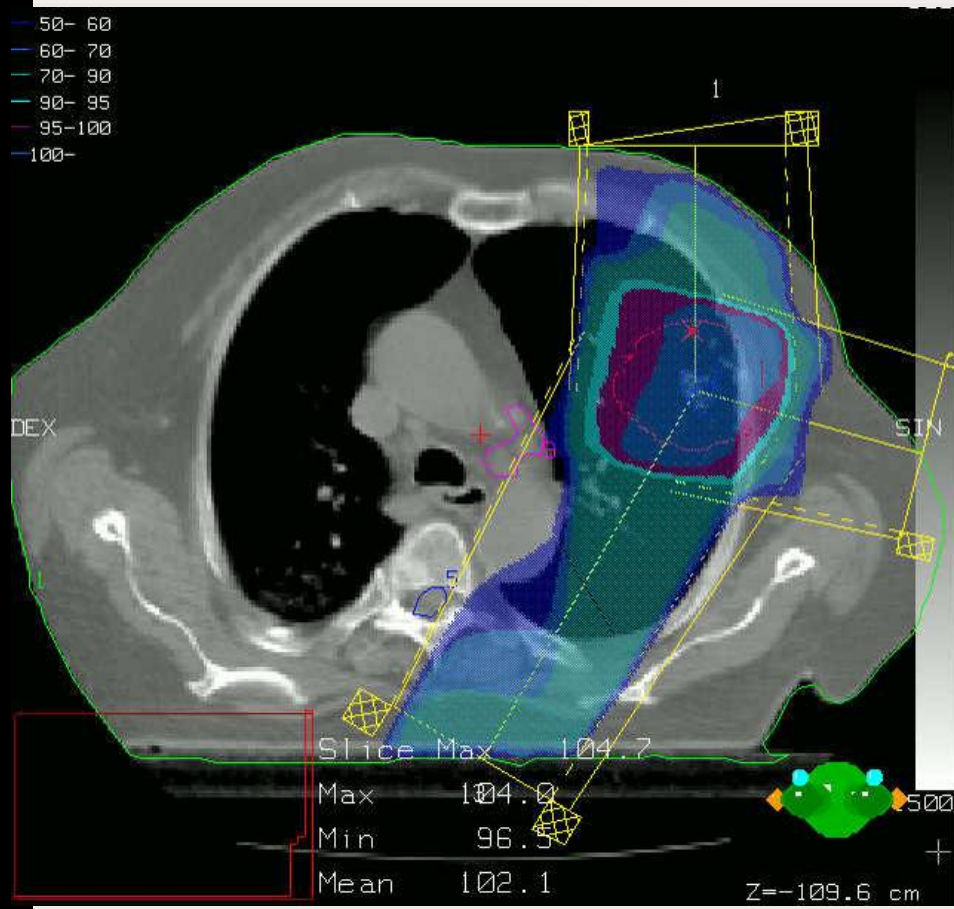
Role of Radiation Medicine in Cancer Management:
Staging



PET and CT

Role of Radiation Medicine in Cancer Management:
Planning Treatment





CT *versus* PET/CT

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Role of Radiation Medicine in Cancer Management:
QA in Diagnostic Radiology

IAEA New X-ray calibration facility

QC check

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Role of Radiation Medicine in Cancer Management:
QA in Radiation Oncology

QA Team for Radiation Oncology (QUATRO):

- ✓radiation oncologist
- ✓medical physicist
- ✓RTT

The IAEA dosimetry travel kit for

QUATRO missions

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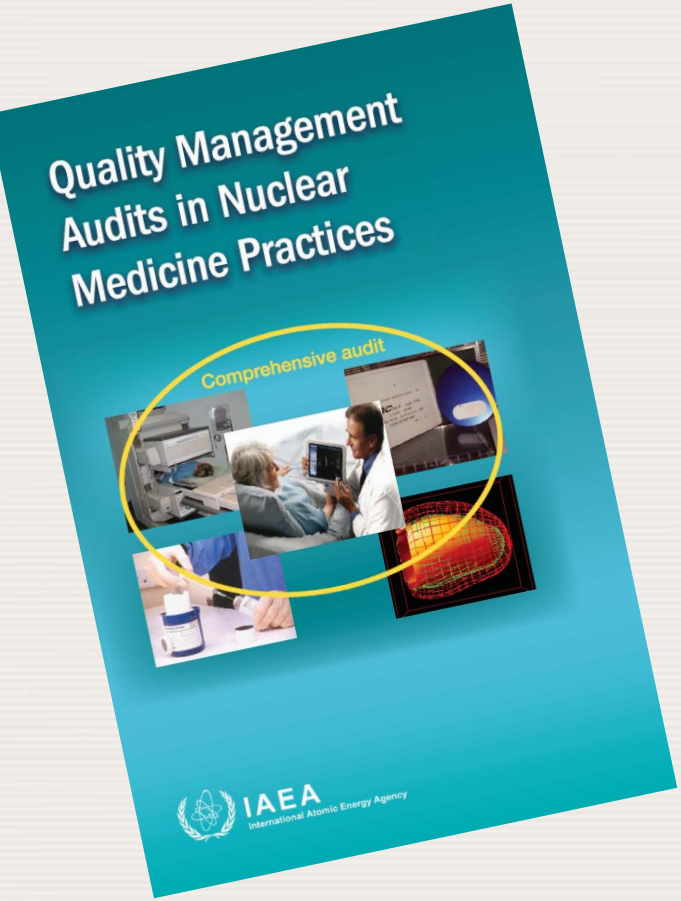
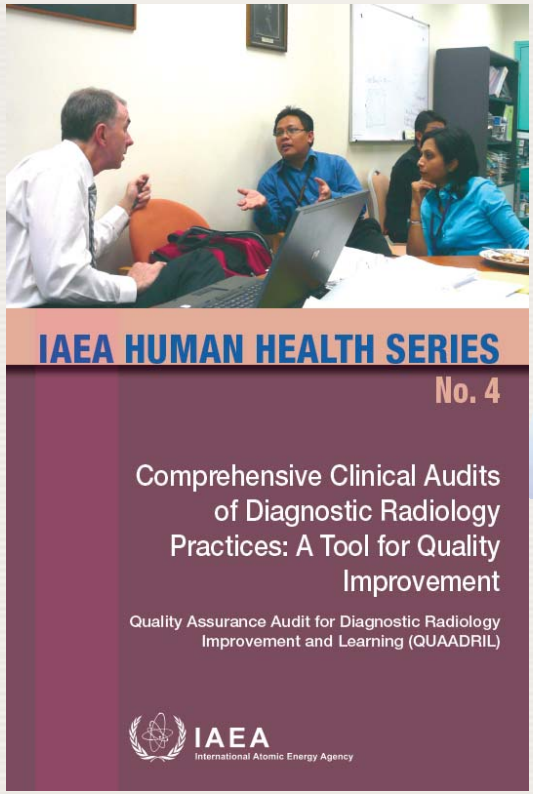
Role of Radiation Medicine in Cancer Management:
QA Publications





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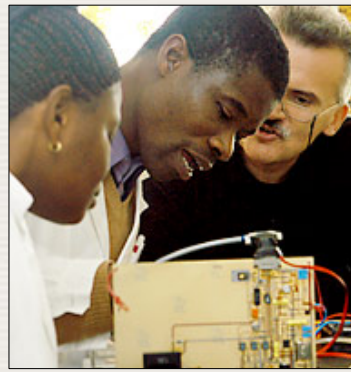
Department of Technical Cooperation

Promoting tangible socio-economic impact by contributing directly to the major sustainable development priorities of each country

- Transfer of nuclear-related technology when and where it has a comparative advantage
- Human capacity building
- 112 recipient countries in 2006



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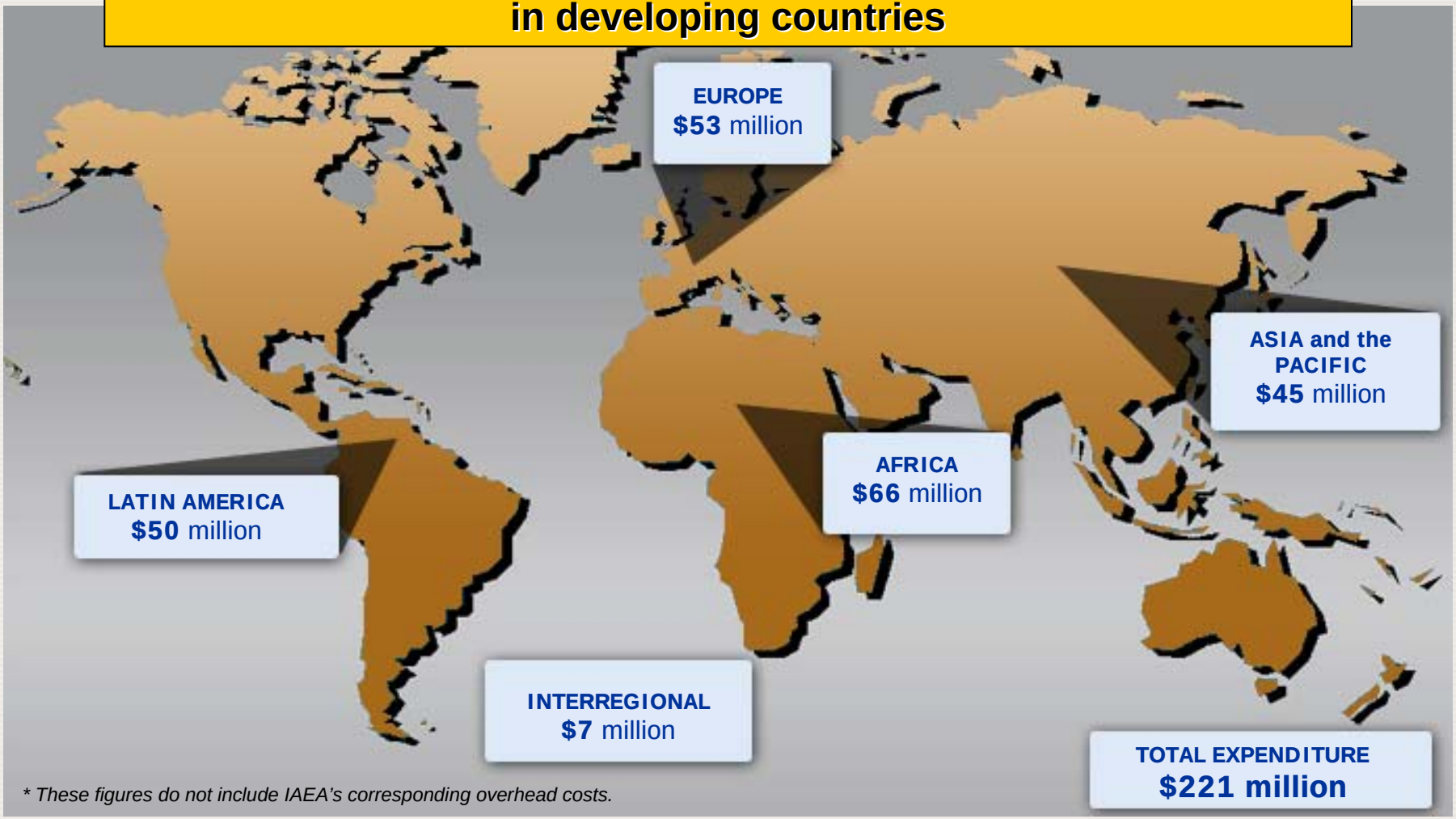
IAEA & Radiotherapy Capacity Building

Decades of building radiotherapy capacity (for cancer treatment) in developing countries



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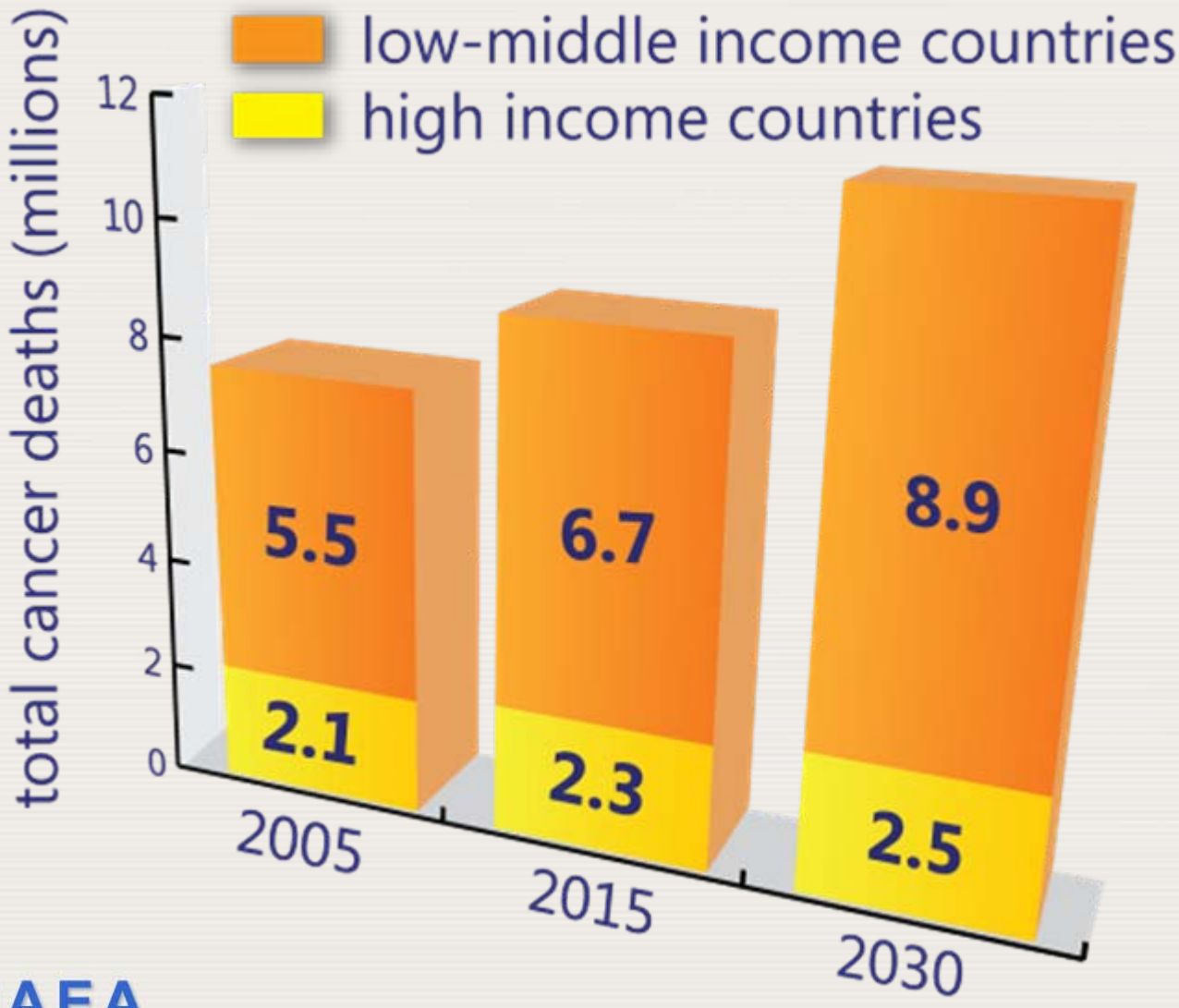
Expenditure on Cancer TC Projects 1980-2009

Cancer: a Growing Epidemic



* Chart courtesy of WHO

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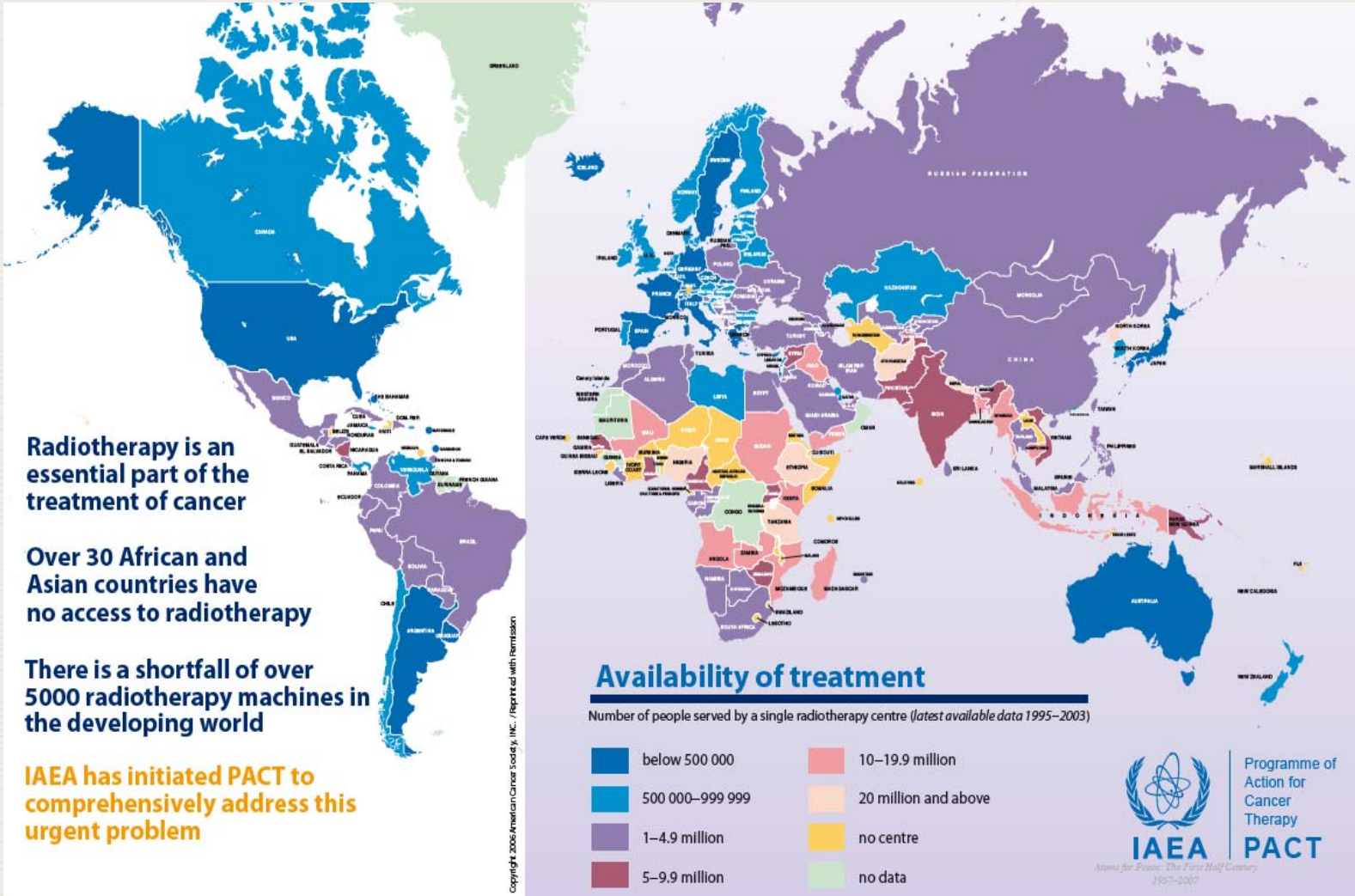
Shortage of Radiotherapy in the World



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2005 Nobel Peace Prize and IAEA Response to Cancer Control

To the IAEA and its Director General

"for their efforts to prevent nuclear energy from being used for military purposes and to ensure that nuclear energy for peaceful purposes is used in the safest possible way."

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Programme of Action for Cancer Therapy (PACT): Mission and Milestones

To improve cancer survival in low-resource countries by integrating radiotherapy investments into public health systems

2004-05 **PACT** established as the IAEA flagship programme to address full spectrum of cancer control, using radiotherapy as an anchor, in response to WHO call for global action.

2006 **PACT Model Demonstration Sites** (PMDS) established in 6 pilot countries

2009 **WHO-IAEA Joint Programme** on Cancer Control

WHO country office, Uganda (photo J.P. Cayol)

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PACT:
Comprehensive Approach of Cancer Control

Prevention

Early detection

⇨ Mammography

Diagnosis & Treatment

⇨ Nuclear medicine
⇨ Radiation diagnostic
⇨ Radiotherapy

Palliative care

⇨ Palliative radiotherapy

IAEA
radiation medicine (+radiation protection)

PACT
(IAEA+WHO+ partners)
comprehensive cancer control

WHO/IAEA Joint Programme on Cancer Control

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PACT:
Innovative Approach of Cancer Control (1/2)

- **Building partnership** with key cancer control organisations, WHO, IARC, UICC… to complement IAEA expertise in radiation medicine (>50 partners to date)
- **Mobilizing resources** for Member States from non-traditional sources (>$27 M to date)
- **Promoting** establishment of **National Cancer Control programmes** in developing Member States

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PACT:
Innovative Approach of Cancer Control (2/2)

- **Advocating** to place cancer on global health agenda (revision of MDGs)

- **Promoting** regional **education, training** and **e-learning** for cancer professionals

(photo ESA)

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PACT:
Three Stages of Implementation

1. On site comprehensive cancer control needs assessment (***imPACT***) (>72 MS requests)

2. PACT Model Demonstration Sites (***PMDS***) showcasing synergies with partners (7 PMDS)

3. Regional cancer training networks for capacity building & virtual university for cancer control (***VUCCnet***) (pilot in Africa)

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Cancer treatment in Indonesia: a Long History

1927

- **1st radiology service/cancer treatment at Copto Mangunkusumo General Hospital in Jakarta, by Dr B. Van Der Plaats**

2010

- **Asian Oncology Summit in Bali to lead into the future**

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Thank you

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