IAEA DIRECTORY OF RADIOTHERAPY CENTRES (DIRAC)

J. Izewska, Y. Pynda, A. Friesenhengst, M. Kemppi, L. Luketin, D. Szegedi, J.A. Polo, E. Zubizarreta

International Atomic Energy Agency, Vienna, Austria

dirac@iaea.org
What is DIRAC?

• DIRAC is the only database of radiotherapy resources worldwide available today.
• DIRAC contains data on radiotherapy machines, radiation sources and related devices, and staff at radiotherapy centres.
• DIRAC is updated regularly based on voluntary data submission by radiotherapy centres.
DIRAC milestones

• 1959 IAEA starts registering radiotherapy centres
• 1968 first edition of the “Directory of High-Energy Radiotherapy Centres”
• 1976 2\textsuperscript{nd} edition of the directory
• 1995 IAEA launches the DIRAC project
• 2000 DIRAC available on CD ROM
• 2004 DIRAC available online
• 2006 online data entry by users
• 2016 IAEA launches a new and enhanced DIRAC platform with interactive maps
Data collection for DIRAC

• Individual radiotherapy centres
• Participants in the IAEA/WHO postal dose quality audits for radiotherapy centres
• IROC-Houston QA Centre
• National databases
• Participants in IAEA sponsored training
• Professional societies
• National coordinators officially nominated by governments
• Manufacturers of radiotherapy equipment
• IAEA field missions.
Current status of DIRAC data

• Data on over 7000 operational radiotherapy centers in 139 countries organized in 15 geographical regions

• Approx. 14000 operational teletherapy machines (~11500 linacs, ~2200 Co-60 units, >100 particle accelerators)

• More than 2500 brachytherapy units

• Approx. 6700 treatment planning systems, 3700 simulators, 3600 computed tomography systems

• Approx. 69000 staff (23600 radiation oncologists, 10700 medical physicists, 34700 radiation therapists)
Of the 55 African countries registered in DIRAC, only 24 operate radiotherapy services with 342 radiotherapy machines serving 1.2 billion population.
Most linacs are in HIC.
Most Co-60 units are in Eastern Europe and Asia.
Most new installations are linacs. Approx. 370 RT machines still in use are >30 years old.
DIRAC important facts

- DIRAC contains information on 196 countries and territories of more than 100,000 population; of these, 139 countries operate radiotherapy services.
- There is no radiotherapy in 36 countries and no information in DIRAC about further countries.
- LIC and LMIC have less than 10% of teletherapy machines which serve almost 50% of the world population, whereas HIC have over 60% of all teletherapy machines and 16% of the world population.
- There is a similar disparity trend regarding cancer incidence.
Summary

• The results of DIRAC data analysis highlight disparities across geographical areas and economy levels, and indicate deficit of radiotherapy equipment needed for cancer treatment in low and middle income countries.

• Efforts are being made to keep DIRAC data at a level of quality that it can be used for various radiotherapy data analyses.
Thank you

DIRAC can be accessed at the IAEA website at
https://dirac.iaea.org