

# Radiation Oncology: A Global Perspective

Compiled by the Global Health Initiative  
Subcommittee (ARRO)

## Section II:

# Availability of Radiotherapy Services (Current)

# Current Availability of Radiation Equipment

- Over 50-60% of cancer patients will require radiation therapy as part of their treatment; however, in the developing countries, less than 20% of cancer patients will have access to radiotherapy
- Developing countries account for 85% of world's population, but only account for 35% of world's radiation facilities. Developed countries account for 15% of the population, with 85% of radiation facilities
- Total number of radiotherapy machines in developing countries: 4,400 (35% of world's radiation facilities)
- At least one radiotherapy unit for every 250,000 people is available in most high income countries; while, a survey of 20 low and middle income countries found that one radiotherapy unit to every 5 million people and sometimes, one unit for every 20 million people is available
- Currently, 30 countries (15 in Africa and Asia) do not have any radiation machine



## Relationship of Cancer Incidence and Shortage of Radiation Units in LMIC

Current incidence of cancer in developing low-middle income countries (LMIC): Eight million per year

Current radiotherapy units needed: 9,600

Current supply: 4,400

**Current Shortage: 5,000**

Table 2: Crude cancer incidence for the LMIC regions

Region	Crude cancer incidence/ million population	60% needing RT treatment	Add 23% for Re-treatment	Number of RT units/ million population
Africa	725	435	535	1
Asia	1,487	892	1,097	2
East Asia	2,370	1,422	1,749	>3
West Asia	999	599	737	>1
Latin America and the Caribbean	1,573	944	1,161	>2
Average All LMIC	1,280	768	944	2
Europe	4,381	2,629	3,233	6

## Distribution of Megavoltage Units per World region

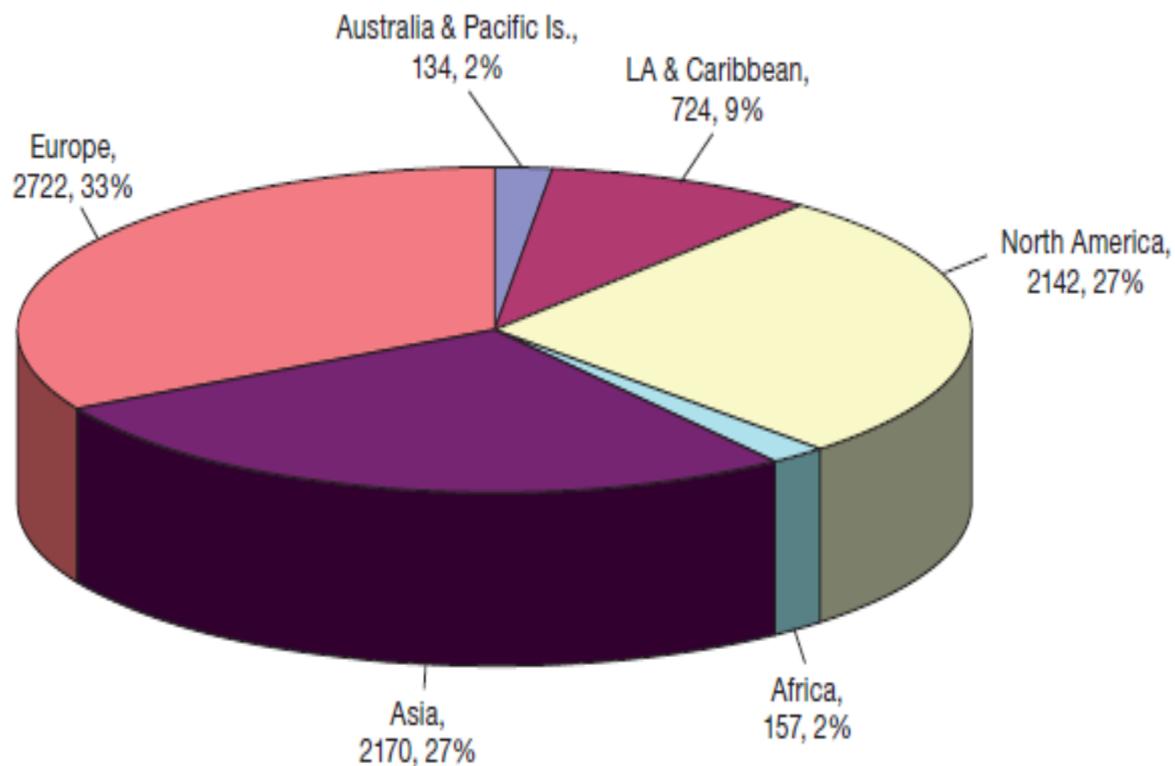


FIG. 2. Distribution of megavoltage units (linacs and <sup>60</sup>Co machines together) per region of the World. (Source: LAEA, DIRAC directory, 2006 [126]).

# Distribution of Megavoltage Units

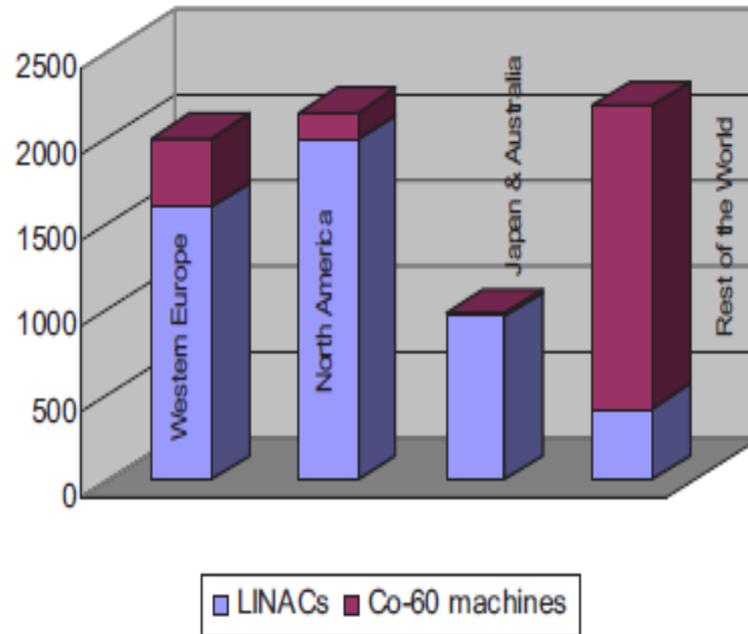


FIG.3. Distribution of megavoltage units (linacs and  $^{60}\text{Co}$  machines) considering their industrial development. (Source: Created with data from IAEA, DIRAC, 2006 [126]; Hitoshi, 2005[127]).

# Average Number of Megavoltage Units per Million

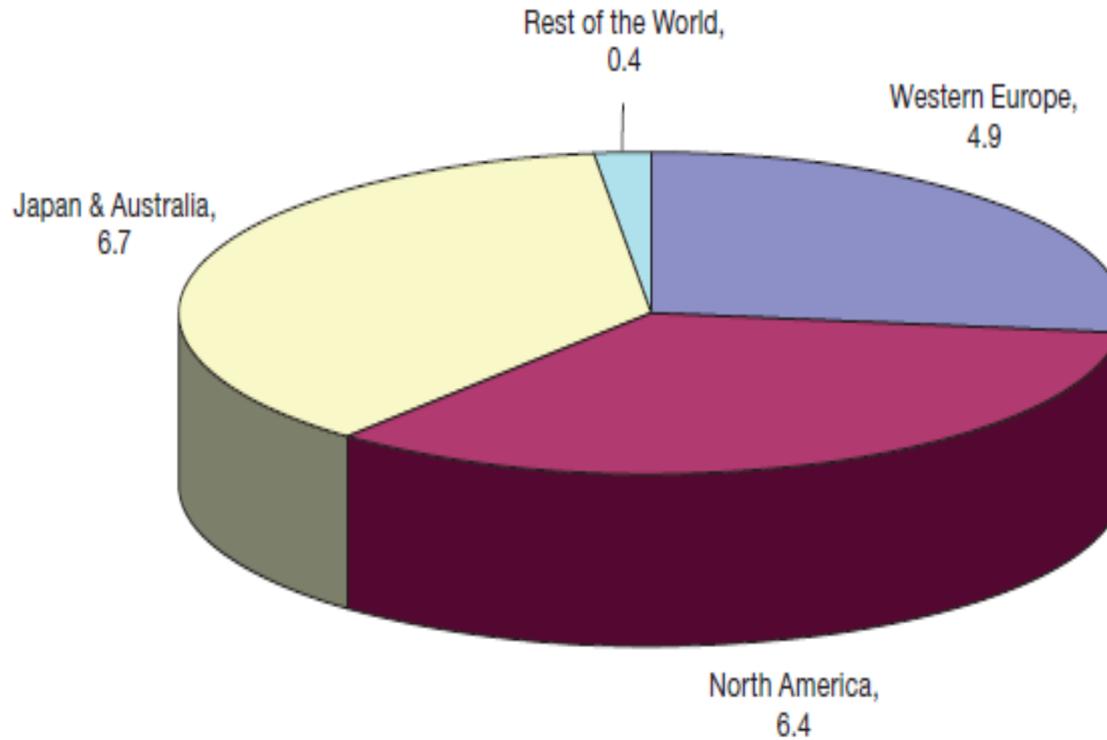


FIG. 4. Average number of megavoltage units per million. (Source: IAEA, DIRAC directory, 2006 [126]).

## Megavoltage Unit per Million Inhabitants (Country Specific)

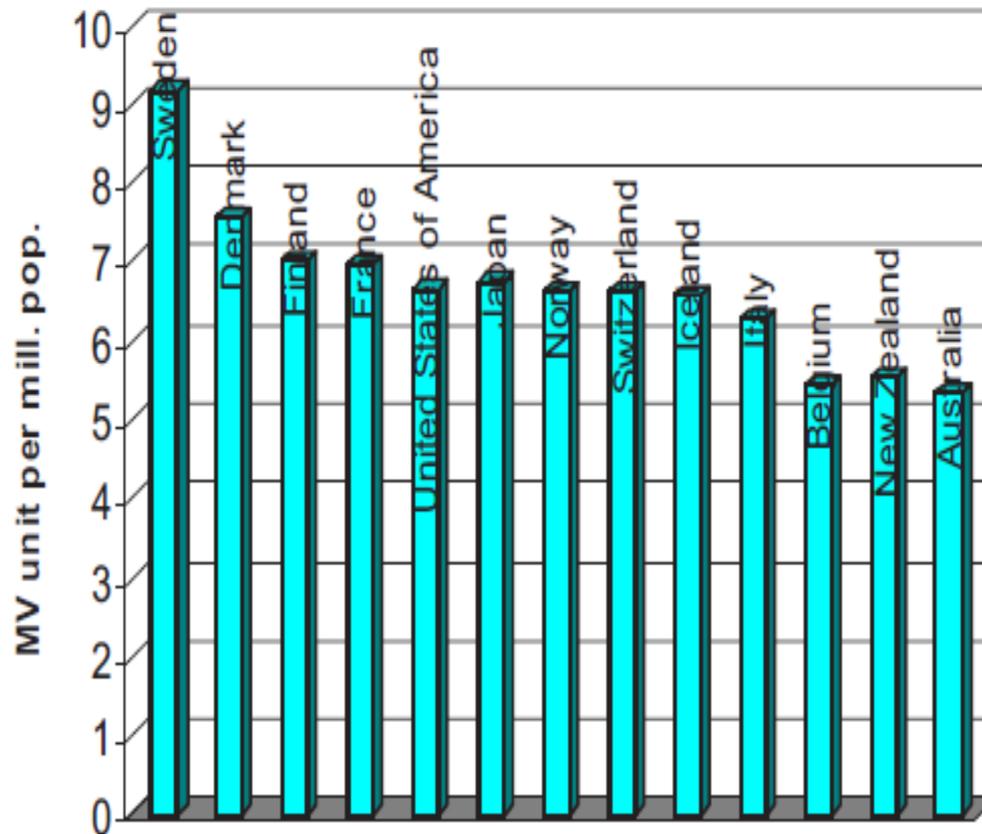


FIG 5. Countries with the highest average number of megavoltage units per million inhabitants. Source: IAEA, DIRAC directory, 2006 [126].

## Megavoltage Unit per Million Inhabitants (LMIC)

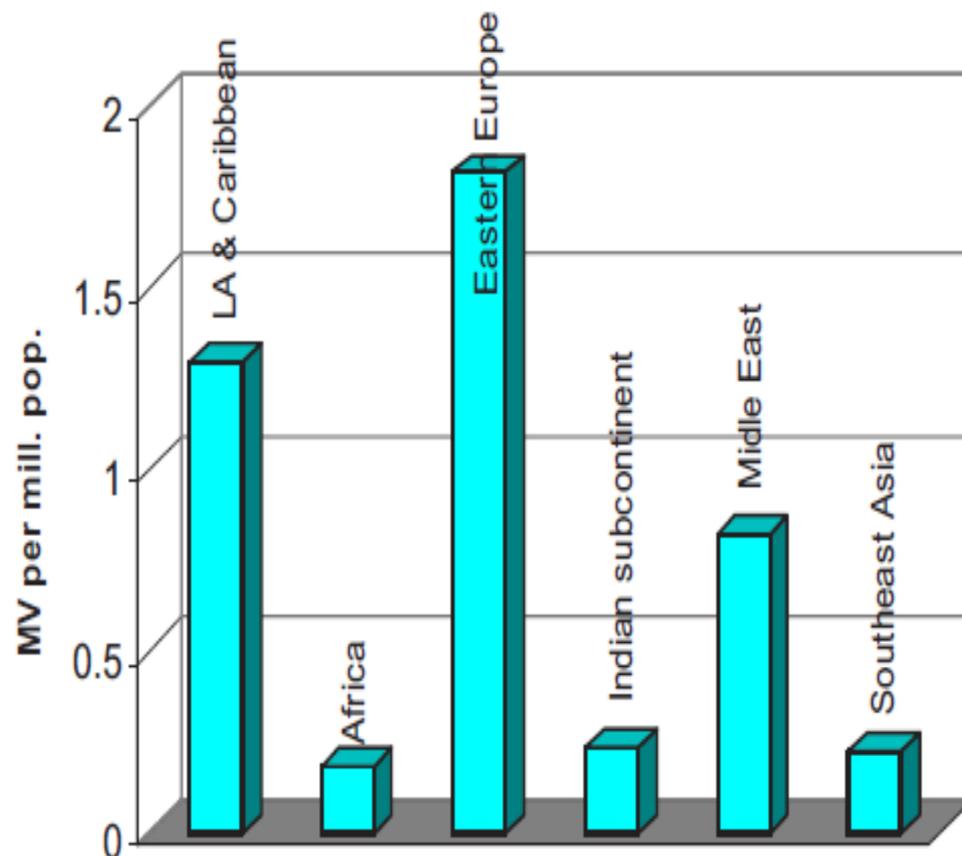


FIG. 6. Average number of megavoltage units per million inhabitants in regions of low and middle income countries. Source: IAEA, DIRAC directory, 2006 [126].

## Distribution of Brachytherapy Equipment

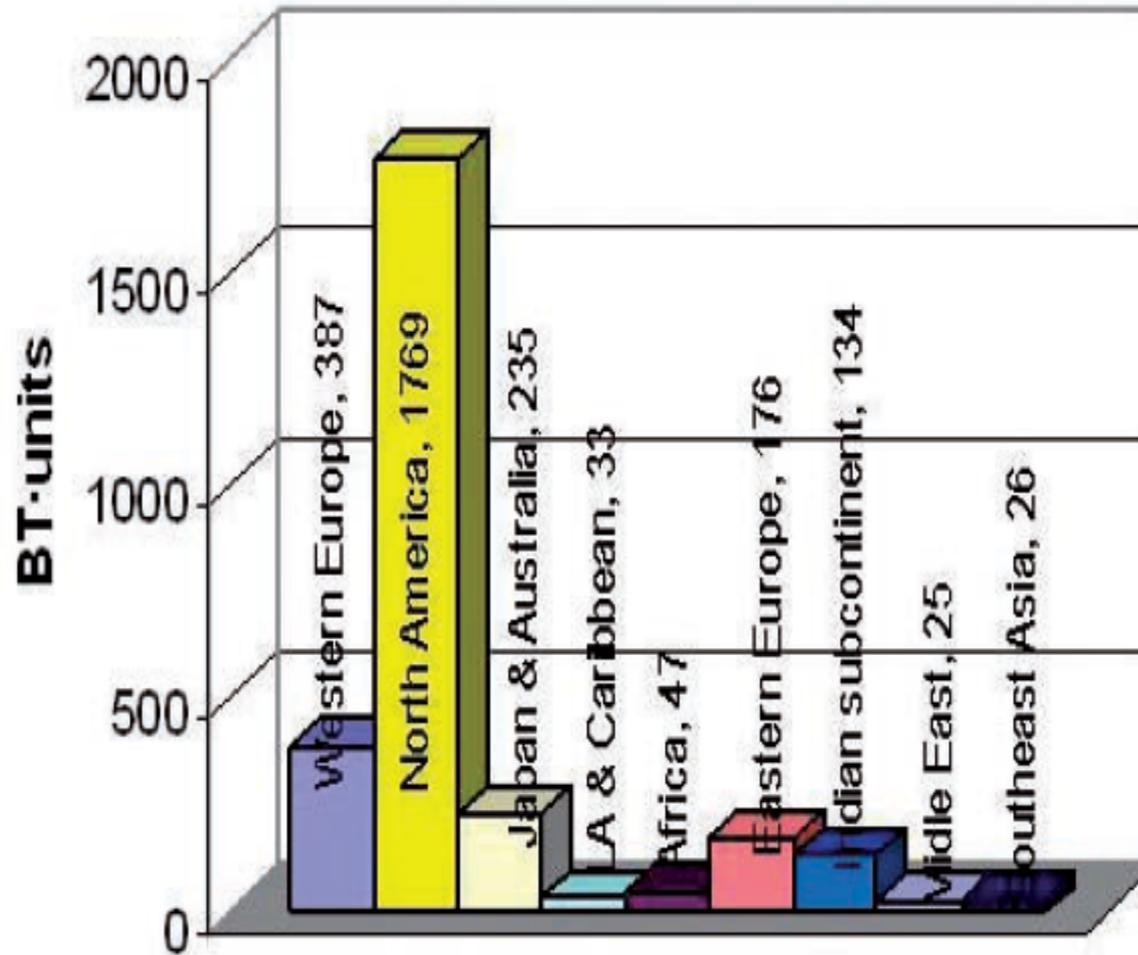


FIG. 9. Distribution of brachytherapy equipment (LDR manual and afterloaders, MDR, HDR) relative to industrial development. Source: Created with data from LAEA, DIRAC directory, 2006 [126]; Ferlay et al. 2004–GLOBOCAN 2002 [4]; IMV Medical Division, Nucletron, USA.

# Distribution of Megavoltage Units per World region

