

AGaRT

The Advisory Group on increasing
access to Radiotherapy Technology
in low and middle income countries



Programme of
Action for
Cancer
Therapy

PACT

A Global Radiotherapy Shortage

Radiotherapy, diagnostic radiology, nuclear medicine and medical physics are essential for detecting, diagnosing and treating cancer. Radiotherapy, the treatment of cancer by radiation, can, in many instances, save lives. Even in cases where the disease is too advanced to be cured, radiotherapy can provide palliation that allows patients to live out their lives as comfortably as possible. In high income countries, between 50 and 60% of patients diagnosed with cancer will be administered radiotherapy at some point during their treatment. For many living in low and middle income countries (LMICs), radiotherapy remains an unattainable treatment option, **with only 25% of radiotherapy patients in LMICs having access to the radiotherapy treatment they need to increase their chances of survival.**

Today, over 25 countries have no available radiotherapy units, leaving cancer patients living in those countries to spend enormous sums of money to be treated abroad, or, more commonly, to go without treatment. However, even when radiotherapy is available, it is often inadequately resourced for the number of cancer patients in need of care. Most high income countries have at least one radiotherapy unit available for every 250 000 people. In contrast, in nearly 20 LMICs, each unit must provide services for more than 5 million people, and in some cases for 20 million people or more. But more than just greater availability of equipment is required to address the issue of global access to radiotherapy. **In some countries, even if radiotherapy services are available, economic or geographic barriers can prevent treatment.** In others, inadequate staffing, the acquisition of unsuitable equipment or poor equipment maintenance can leave cancer patients without proper access to treatment. Until LMICs can acquire the proper capacity for providing radiotherapy, millions of cancer patients throughout the world will continue to be deprived of an essential element of cancer treatment and palliation.

The Advisory Group

To address the shortfall of radiotherapy services in LMICs, the International Atomic Energy Agency (IAEA) established the **Advisory Group on increasing access to Radiotherapy Technology in low and middle income countries (AGaRT)** in 2009 under the Programme of Action for Cancer Therapy (PACT), with the technical support of the Division of Human Health and the Division of Radiation, Transport and Waste Safety. AGaRT acts as a neutral facilitator to bring together radiotherapy users in LMICs and major radiotherapy equipment suppliers, to encourage dialogue that will ensure that the unique radiotherapy service requirements of LMICs are met by the technology available. AGaRT provides an unprecedented platform to:

- Assess current radiotherapy opportunities and capacities, to increase access to radiotherapy technology;
- Identify gaps in the accessibility of radiotherapy services and the limitations in the delivery, operation and maintenance of radiotherapy equipment in LMICs;
- Review and recommend criteria for radiotherapy equipment that is affordable, effective and appropriate for the conditions of LMICs;
- Review and recommend minimum requirements to operate a radiotherapy facility safely and ensure its sustainability in LMICs.

It is envisioned that, through these activities, AGaRT will establish a mutual understanding among radiotherapy users and suppliers. Through addressing issues of cost, quality, availability, sustainability and complexity, AGaRT will encourage the selection of radiotherapy equipment that is affordable, sustainable and suitable for LMICs and, in so doing, increase access to radiotherapy.

Radiotherapy technologists with a cobalt-60 radiotherapy unit at Can Tho Oncology Hospital, Can Tho City, Vietnam.



Meeting the Needs of LMICs

Affordability

While in some high income countries external radiotherapy only accounts for 5% of the total cost of cancer care, for many LMICs the infrastructure for and capital costs of initiating radiotherapy are very high, sometimes reaching more than \$4 million per unit. When auxiliary costs such as training and maintenance are added, the total price is vastly increased. To make radiotherapy equipment more accessible, it is imperative that the equipment produced can be sold and maintained at a lower cost, without sacrificing safety or quality, thus making radiotherapy affordable to LMICs that could not otherwise afford it.

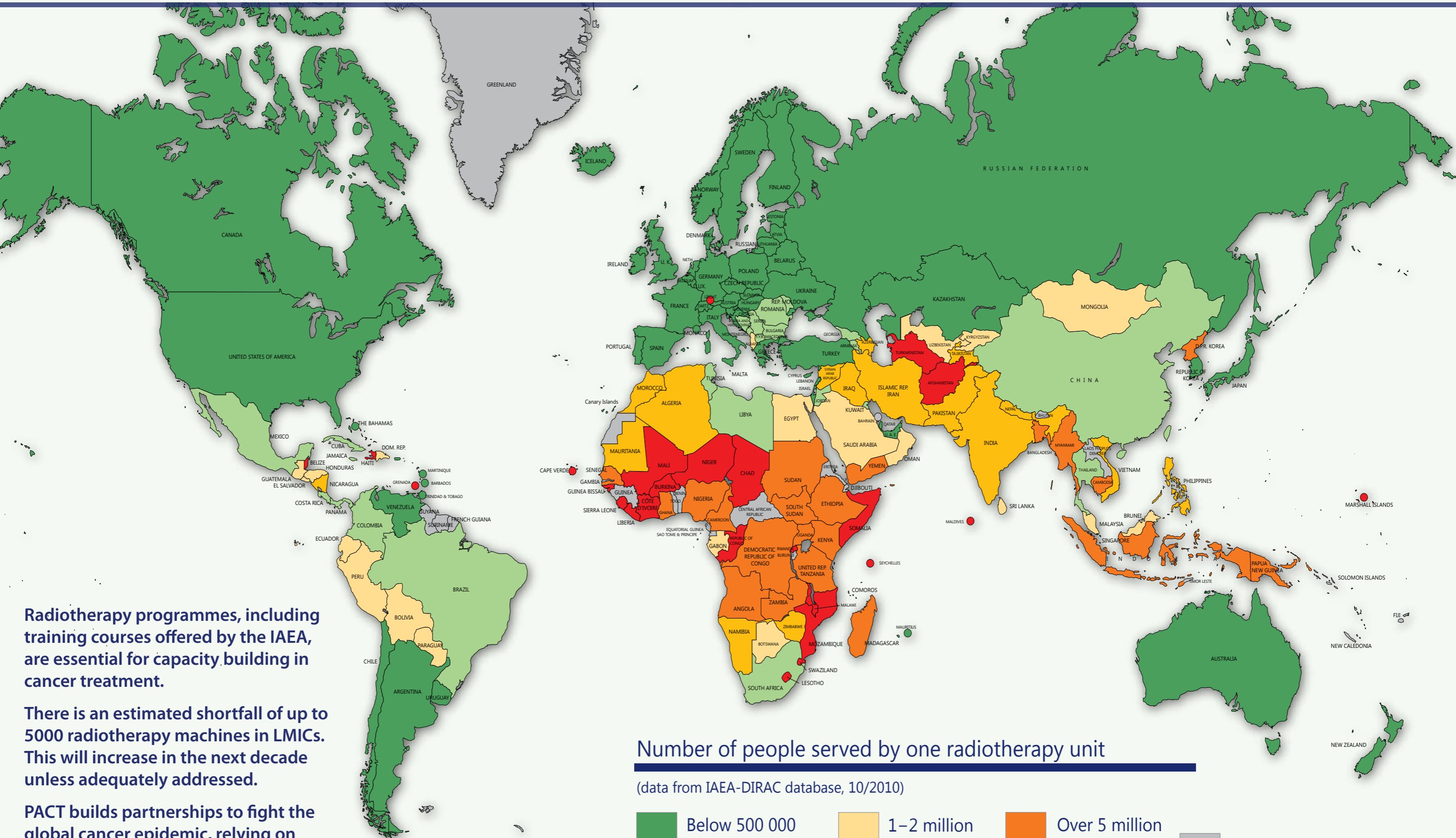
AGaRT is designed to foster a collaborative environment where participants from LMICs, the radiotherapy industry and regional radiotherapy experts can come together to produce guidelines on the sale and servicing of radiotherapy solutions. These guidelines will encourage users to properly balance medical, technical and economic aspects when selecting equipment for a radiotherapy unit, and challenge manufacturers to reduce the cost of machinery; to offer long term, cost-effective contracts; and to provide suitable training for equipment use. It is expected that the recommendations of AGaRT will help manufacturers to gradually adjust their technological developments, financial strategies and service policies to address the needs of emerging markets in LMICs, while at the same time enabling LMICs to develop realistic plans for investments in radiotherapy over the longer term, taking into account key issues such as equipment choices, contracting and human resource requirements.

Composition of AGaRT

Those participating in AGaRT include:

- Experts from IAEA regions, including Africa, Europe, Latin America, and Asia and the Pacific;
- Manufacturers of radiotherapy equipment;
- International organizations and other relevant institutes, including the IAEA, the International Electrotechnical Commission (IEC), the International Organization for Medical Physics (IOMP), the Korea Institute of Radiological and Medical Sciences (KIRAMS), the National Institute of Radiological Sciences of Japan (NIRS), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the University Cancer Center Hamburg, and the World Health Organization (WHO).

Access to Radiotherapy



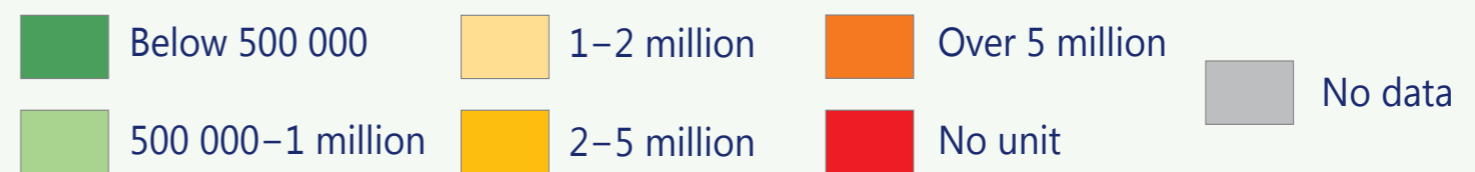
Radiotherapy programmes, including training courses offered by the IAEA, are essential for capacity building in cancer treatment.

There is an estimated shortfall of up to 5000 radiotherapy machines in LMICs. This will increase in the next decade unless adequately addressed.

PACT builds partnerships to fight the global cancer epidemic, relying on the IAEA's extensive experience in delivering radiotherapy technology and know-how.

Number of people served by one radiotherapy unit

(data from IAEA-Dirac database, 10/2010)



Sustainability

Another focus of AGaRT will be improving the sustainability of radiotherapy equipment in LMICs. Currently there is a major disconnect between the services and support required to keep the equipment running efficiently and effectively and the services and support available in LMICs. Often, when a machine purchased by an LMICs requires maintenance after the warranty period, the country must pay for the replacement of a part of the equipment or bring in an expert from abroad to make repairs. For LMICs, both of these options are frequently unaffordable. Similar problems can occur when replacing the radioactive source inside a teletherapy cobalt-60 unit, which must be done every five to seven years, or during the decommissioning of the unit itself after 10–15 years or more.

Adding to the difficulties of maintenance, regular changes in equipment designs frequently lead manufacturers to discontinue support for older models. For an LMIC in possession of these units, the change in maintenance support can force it to abandon an older, but otherwise operational unit due to an inability to acquire the parts necessary for repair. AGaRT encourages manufacturers to either support repairs for all functioning models or exchange old equipment for more updated models at a reasonable price.

To address these issues, **AGaRT has recommended the development of provisions for 'whole of life' support packages** from radiotherapy suppliers that will ensure affordable functionality for the entire life cycle of a unit, thus increasing the sustainability of radiotherapy technology in LMICs. Some aspects of this process that will be analysed include an evolution in the contracting of radiotherapy equipment to LMICs, the repatriation and resupply of radioactive sources, the development of regional expertise for radiotherapy unit repairs in low-resource settings, and financial planning that might make the initial procurement of equipment more expensive but that has the potential to reduce aggregate costs over time.

HDR brachytherapy unit at St. Luke's Medical Center, Quezon City, Philippines.



Although LMICs represent around 85% of the world's population, they possess less than 40% of the world's radiotherapy facilities.

The opening of the first meeting of the Advisory Group on increasing access to Radiotherapy Technology in low and middle income countries, held in June 2010 at IAEA Headquarters in Vienna.



Suitability

In order to utilize the radiotherapy equipment that is vital for cancer treatment and palliation, a capable and dedicated health workforce is needed. The number of adequately educated medical practitioners in LMICs is often lower than is required to run a basic radiotherapy clinic. The IAEA recommends around 20 staff members, including medical physicists and technicians, for each basic radiotherapy clinic with two radiotherapy units. Difficulties in building the necessary workforce for operating a clinic are exacerbated by the extensive specialized training that is required to utilize the equipment safely and effectively.

Through AGaRT, manufacturers and radiotherapy experts will discuss and review possible options for developing high throughput technology that can provide countries lacking in human resources with an opportunity to utilize the most appropriate radiotherapy equipment available. This will encourage LMICs to employ the machines that they need as quickly as possible, helping to control the cancer epidemic while it is more manageable. In parallel, the IAEA and its partners will continue to support education and training programmes in LMICs, particularly through modern IT, e-learning and virtual universities, as a means to increase training capacities at the national or regional level.¹

Over 25 countries have no radiotherapy services available.

The Path Ahead

To achieve universal access to radiotherapy services, a complete solution that can address all facets of radiotherapy acquisition and use must be developed. Urgent solutions are needed as, **by 2020, annual cancer cases in LMICs are expected to rise by 30%, to 10.3 million.** AGaRT is working to drive down the cost of radiotherapy and to provide more sustainable and efficient equipment to treat patients in LMICs by encouraging manufacturers to simplify their designs, while maintaining a consistently high level of safety and quality. However, AGaRT's efforts are only the first steps. International radiotherapy stakeholders need to continue to work together to ensure that AGaRT's outcomes are put to use as a complement to all other ongoing efforts, so that, eventually, radiotherapy will be accessible as an affordable, appropriate and sustainable technology for LMICs everywhere.

¹ More information on training can be found at <http://humanhealth.iaea.org>, <http://tc.iaea.org> and <http://cancer.iaea.org/vuccnet.asp>

"This is a tremendous opportunity for both users in low and middle income countries and equipment manufacturers to share their experience with the provision of radiotherapy. By matching requirements, improvements in access to safe and effective treatments can become available where it is needed most."

*Associate Professor Graeme Morgan, Director of Radiation Oncology, Royal North Shore Hospital, Sydney, Australia
Chair of the inaugural AGaRT Meeting, June 2010*



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