



IAEA



Rays of Hope

Cancer care for all



Half of cancer patients who need radiotherapy in low- and middle-income countries do not have access to it. This is a sobering statistic. And it is unacceptable.

— Rafael Mariano Grossi,
IAEA Director General

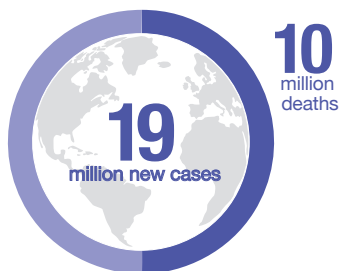


www.iaea.org/rays-of-hope

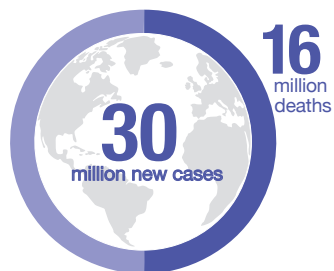
#CancerCare4All

The Global Cancer Burden

2020



2040



Over 70% of cancer deaths occur in LMICs.

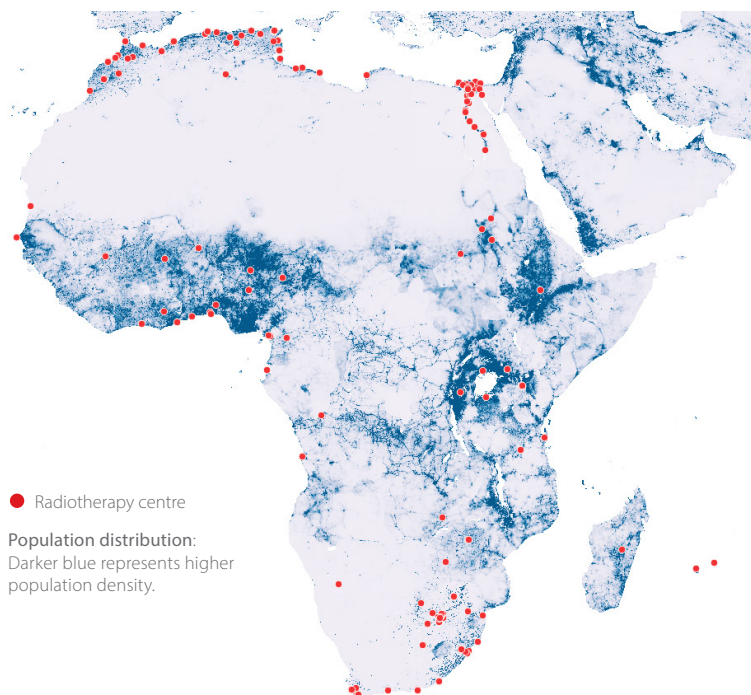
70%

Only 5% of global spending on cancer goes to LMICs.



About half of cancer patients require radiotherapy.

OVER 70% OF THE POPULATION OF AFRICA DOES NOT HAVE ACCESS TO RADIOTHERAPY.



In Africa, over 700,000 people died of cancer in 2020. More than 20 African countries have no radiotherapy treatment unit.

Cancer kills far too many people — particularly in Africa. Rays of Hope sets out to change that by supporting the establishment and expansion of radiotherapy services, with a particular focus on the more than 20 IAEA Member States that completely lack facilities for radiation treatment.

Cancer cases will increase as Africa's population grows and economic progress raises life expectancy. The situation is most acute in the countries that lack facilities and trained personnel in radiotherapy altogether.

Even though the assistance provided by the IAEA has enabled many countries to establish and/or strengthen safe, secure and effective radiation medicine (radiotherapy, radiology and nuclear medicine) capabilities, the IAEA needs more resources to bridge the enormous shortfall in equipment and highly skilled and well-trained personnel in low- and middle-income countries (LMICs).

THE IAEA'S ROLE IN FIGHTING CANCER

The IAEA has six decades of experience in helping countries fight cancer. From procuring equipment for diagnostic imaging, nuclear medicine and radiotherapy to training staff on its safe, secure and effective use and providing quality assurance services, the IAEA helps countries respond to the growing cancer burden. It has been doing so **in cooperation with the World Health Organization (WHO)**, whose experts participate in various IAEA projects.

Tackling the burden of cancer requires multidisciplinary, systematic, equitable, continuous and evidence-based strategies for prevention, early detection, diagnosis, treatment and palliation. These strategies have to be formulated into a national cancer control strategy. This requires inclusion of all elements across the cancer continuum, framed by health systems and supported by effective financing strategies, monitoring systems and quality management.

Rays of Hope will integrate the breadth of the IAEA's expertise to support Member States in the diagnosis and treatment of cancer using radiation medicine.

IMPROVING CANCER OUTCOMES THROUGH RADIATION MEDICINE

Radiotherapy is an essential component of both cure and palliation of cancers. It uses ionizing radiation emitted by a radiation source to attack and destroy cancer cells. Meanwhile, a safety and security infrastructure is paramount to protect patients, staff, the public and the environment from the potential harmful effects of ionizing radiation. The selection of appropriate therapy — surgery, chemotherapy, radiotherapy or their combination — is based on precise diagnosis, as well as evaluation of the location and spread of the disease, through information that is provided by medical imaging and nuclear medicine.

Package 1

Estimated value:
US\$ 7.5 million

Capital costs and operating costs over two years, including participation in ongoing learning and research activities and support from a regional anchor centre of excellence

- Optimal as entry package for countries that lack radiotherapy and have limited financial and human resources.
- It can treat optimally up to 500 cancer patients per year and is scalable with a second treatment unit for a total of 1000 cancer patients per year.

Includes:

1. Two bunkers
2. One conventional simulator
3. One teletherapy cobalt unit
4. One high dose rate (HDR) brachytherapy afterloader

Features:

- Less dependence on water and electricity infrastructure
- Maintenance needs are lower, leading to less expected downtime
- Shorter learning curve required to operate

Package 2

Estimated value:
US\$ 12.5 million

Capital costs and operating costs over two years, including participation in ongoing learning and research activities and support from a regional anchor centre of excellence

- Optimal as entry or expansion package for countries with trained human resources and enough financial capacity to sustain maintenance costs.
- It can treat optimally up to 1000 cancer patients per year. Equipment configuration can be upgraded to tailor to future needs.
- Requires reliable electricity and water supply.

Includes:

1. Two bunkers
2. One CT-simulator
3. Two single-energy LINACs
4. One HDR brachytherapy afterloader

Features:

- No need for exchange of radioactive cobalt source, therefore logistics of long-term operations is easier; no need for specific nuclear security arrangements
- Requires reliable infrastructure
- Longer learning curve / prior knowledge and training desirable to operate

Package 3

Estimated value:
US\$ 16 million

Capital costs and operating costs over two years, including participation in ongoing learning and research activities and support from a regional anchor centre of excellence

- Optimal as expansion package for countries with previous experience in radiotherapy service delivery and enough financial resources to sustain it.
- It can treat up to 1000 cancer patients per year with the more advanced techniques but higher maintenance costs. Needs reliable electricity and water supply, as well as resource-intensive quality assurance programme.

Includes:

1. Two bunkers
2. One CT-simulator
3. Two multi-energy LINACs
4. One HDR brachytherapy afterloader

Features:

- Greater versatility in tailoring procedures to individual patients' needs
- Requires reliable infrastructure
- Longer learning curve / prior knowledge and training required to operate
- Higher ongoing maintenance costs the recipient country will eventually need to bear

Complementing the ongoing efforts of the IAEA to assist Member States improve their cancer care capacities, Rays of Hope focuses on countries most in need: those that lack radiotherapy services altogether or have a poor coverage. Rays of Hope will directly contribute to the fulfilment of the 2030 Agenda and the Sustainable Development Goal 3 (Good Health and Well-Being), Indicator 3.4 to reduce premature mortality from non-communicable diseases by one third.

The projects included in Rays of Hope, based on sustainability, will build or strengthen radiation safety legislation and infrastructure and provide quality control, guidance, training and equipment. Rays of Hope combines several elements into a set of interventions that build on and complement each other in order to maximize impact. Through a sharp focus on countries without radiotherapy or with inequitable access, Rays of Hope will initially focus on prioritizing a limited number of high-impact, cost-effective and sustainable interventions in line with national needs and commitment.

INVESTMENT NEEDS

In order to ensure the sustainability and maximize the impact of Rays of Hope, the IAEA is mobilizing additional resources, advocacy and partnership opportunities.

The indicative packages above comprise optimal combinations of equipment and are built on decades of experience of the IAEA in assisting countries in the development of safe, secure and effective radiotherapy

facilities. The funding needs listed here are for building the facility, purchasing the equipment and training the personnel. Also included are the operating costs for two years to better support planning of services and sustainability.

The IAEA will also support the development and strengthening of national radiation safety and nuclear security infrastructure, as appropriate. The packages include innovation and support for regional anchor centres, which are established and experienced radiotherapy centres working closely with the IAEA.

Innovative approaches are essential to ensure available resources are used to scale up quality access to radiation medicine. It includes the participation of recipient country experts in online training events and professional discussions, as well as in innovation such as research to increase the cost effectiveness and efficiency of interventions. Regional anchor centres will provide much of the training and quality assurance to countries nearby. However, these anchor centres need to first improve their educational and quality assurance infrastructure and be provided with tools to support continuous improvement in the region.

The packages will also contribute to advancing donor development priorities, including gender equality, reducing health inequities for women and children, enhancing education and training, and fostering socio-economic inclusion.

PARTNERSHIPS AND RESOURCE MOBILIZATION MODALITIES

The IAEA is focusing on forging new partnerships and tapping into diverse funding sources, including from governments, international financing institutions and the private sector to ensure maximum reach, impact and sustainability of Rays of Hope. By organizing a coalition of donors and partners, in collaboration with Member States who want to implement these activities, we can best support the enhancement of radiation medicine and save lives.



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More information on the indicative packages listed in this document, including detailed calculations, are available on request.

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