



The problem: Cancer in low and middle income countries

Cancer has reached epidemic proportions worldwide. Globally, it kills more than 7.6 million people every year — more than HIV/AIDS, tuberculosis and malaria combined. The majority of deaths occur in people living in low and middle income countries (LMIC), and the projections indicate that in these countries more than nine million people are expected to lose their battle with cancer annually by 2030. In addition to demographic and lifestyle changes, LMIC suffer from a **poor or non-existent cancer control infrastructure as well as shortage of properly trained human resources.**

More than one third of cancers can be prevented and one third are curable if detected early and treated properly, but in LMIC, about 70% of all cancer cases are **diagnosed too late** to be cured. If action is not taken now, 84 million people, many of them in LMIC, will die of the disease over the next ten years.

With the rising number of cancer cases in LMIC, an alarming number of cancer patients have **no access to early detection services, proper diagnosis, treatment and care (including radiotherapy).** Other socioeconomic factors such as **fear, stigma, and job and family demands** often prevent cancer patients from seeking treatment.

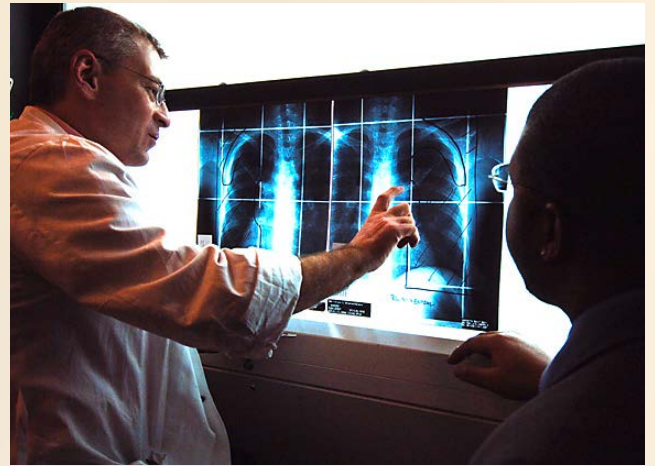


IAEA's Contribution: Radiation Medicine

Nuclear techniques are critical for the early detection, diagnosis, treatment and care of cancer. Often, they are the sole means of diagnosis and treatment, and are one of the most important and efficient methods for treating cancer.

Nuclear medicine and Diagnostic Imaging

Around 40 million nuclear medical examinations are conducted annually around the world using radiopharmaceuticals for diagnostic purposes. Conventional radiology technologies provide not only a large contribution to cancer diagnosis but also are crucial to direct the treatment before starting radiotherapy. Highly sensitive diagnostic images help diagnose major disorders such as cancer, enabling clinicians to administer the most appropriate treatment.



Radiotherapy or Radiation Oncology

Radiotherapy is an essential component in the treatment of cancer for both cure and palliation. It involves treating cancer by radiation through external beams or by brachytherapy, or in vivo therapy using radiopharmaceuticals. Alone, or together with surgery or chemotherapy, radiation therapy is estimated to be prescribed for more than half of cancer patients. In many instances, radiation therapy is an effective means to control symptoms in palliative cancer patients.

Dosimetry and Medical Radiation Physics

In radiotherapy, accurate dose measurement and delivery are critical for effective and safe treatment of patients. In diagnostic imaging, quality assurance processes permit accurate image generation with minimal radiation dose to patients and medical personnel. The IAEA contributes to ensuring the safe and effective use of radiation in medicine by: providing dosimetry calibration services through the IAEA-World Health Organization (WHO) network of secondary standards dosimetry laboratories; conducting independent dosimetry audits for radiotherapy centres with WHO; and offering comprehensive clinical audits to radiation medicine facilities around the world.



Building Partnerships to Save Lives

Expanding radiotherapy capacity alone is not enough to fight cancer. A comprehensive approach that includes **prevention, early detection, diagnosis and other cancer treatment modalities as well as palliative care** is needed to increase survival and to improve quality of life of patients and to ultimately reduce cancer mortality. This is why **coordinating efforts and working together with different partners** is crucial for making a **lasting impact in the fight against cancer**.



Through its Programme of Action for Cancer Therapy (PACT), and in partnership with WHO and the International Agency of Research on Cancer (IARC), the International Atomic Energy Agency (IAEA) is working to assist LMIC plan and evaluate their national cancer control programmes. The three organizations coordinate activities and resources to provide evidence based and sustainable support to comprehensive cancer control programmes in LMIC through a WHO/ IAEA Joint Programme on Cancer Control.

In addition to international organizations and agencies, the IAEA works with national cancer institutes (e.g. US National Cancer Institute (NCI), Institut National du Cancer of France (INCa), and non-governmental organizations (e.g. the Union for International Cancer Control (UICC)).

Together, we work to alleviate the world's cancer crisis.

How PACT Works

PACT services to IAEA Member States focus on four areas: assessing the cancer situation and needs, making radiotherapy accessible, promoting cancer control training and developing global partnerships. These services are carried out in collaboration with partner organizations and Member State governments to ensure that they meet the cancer control needs of individual countries or regions.

Integrated Missions of PACT - imPACT Review

Assessing the Cancer Situation

Through PACT, the IAEA offers the imPACT Review, a cancer control capacity and needs assessment service available to Member States of the IAEA and WHO.

Upon request from the Minister of Health, a multidisciplinary team of cancer control experts is assembled in consultation with WHO Regional Offices, IARC, IAEA partners and internal IAEA stakeholders. The expert team then implements a weeklong mission in the requesting Member State to conduct thorough site visits to institutions involved in all areas of cancer control.

Upon conclusion of the mission, the imPACT Review team delivers a comprehensive report of findings and recommendations to the Minister of Health. The recipient Member State may then use the imPACT Review report to improve its cancer control capacity and propose next steps towards possible future collaboration with the IAEA, WHO and partners.



Case study: Montenegro

In Montenegro, cancer is the second most common cause of death, with breast cancer the most common cancer among women.

At the request of the Ministry of Health, an imPACT Review mission took place in September-October 2010. The mission team included experts from the IAEA and WHO (Headquarters and Country Office) and made site visits to the Ministry of Health and institutions involved in all areas of cancer control. The mission resulted in a report which contained recommendations to the Minister of Health.

Since then, a National Cancer Control Programme (NCCP) has been completed and was adopted by the Government of Montenegro in July 2011. Additionally, planning for a population-based cancer registry is underway and an organized breast cancer screening programme has been set up.

As a specific follow-up activity, the Ministry of Health requested an assessment of its breast cancer strategy and screening programme to achieve sustainable and desired outcomes. The assessment was delivered in December 2012 in collaboration with the WHO Regional Office in Europe.

Under an IAEA Technical Cooperation project 'Upgrading the Quality Assurance and Quality Control Programme in Diagnostic Radiology for a National Breast Screening Programme' initiated in 2012, medical staff is being trained to ensure high-quality screening and diagnostic mammography in Montenegro.



AGaRT – the Advisory Group on increasing access to Radiotherapy Technology in LMIC

Making Radiotherapy Affordable and Accessible

To address the shortfall of radiotherapy services in LMICs, the IAEA established the Advisory Group on increasing access to Radiotherapy Technology in low and middle income countries (AGaRT) in 2009 under 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 a dialogue that will ensure that the unique radiotherapy service requirements of LMICs are met by the technology available.



Case Study: Low and Middle Income Countries (LMIC)

The existing radiation medicine infrastructure and available resources in LMIC can cover only a small portion of the needs. Currently, up to 70% of cancer patients needing radiotherapy have no access to the treatment. Equitable access to radiotherapy technology in LMIC may be hampered by: mismatches between highly sophisticated technologies; difficult environmental and resourcing conditions; prohibitive pricing and limited funding; restricted procurement capacities; shortage of trained workforce; and a lack of adequate radiation regulatory and safety framework.

The provision of a safe and effective radiotherapy service is complex. It needs substantial capital investment in radiotherapy equipment and specifically designed buildings. It also requires continuous maintenance and replacement of equipment, expert teams of doctors, therapists, and physicists, and sustained access to engineering support.

AGaRT representatives from Asia and the Pacific, Africa, Europe and Latin America are currently drafting equipment packages for low and middle income settings. The packages outline a comprehensive inventory of equipment necessary to provide standard radiotherapy services. For example, linear accelerator technology can be amplified with solar panels and can be scaled up with software upgrades to enable more sophisticated techniques.



VUCCnet – Virtual University for Cancer Control: Africa Pilot Project

Promoting Cancer Control Training

Cancer control programmes and services cannot be implemented without the support of a skilled and dedicated workforce. To increase the number of health professionals in LMIC, PACT initiated a pilot project called Virtual University for Cancer Control (VUCCnet) to support and strengthen programmes building human resource capacity in cancer control.

Funded by the Roche African Research Foundation, the US Government and the IAEA, VUCCnet Africa brings together four countries in sub-Saharan Africa, namely Ghana, Tanzania, Uganda, and Zambia. Egypt and South Africa are serving as mentors in the project, assisting in the development of cancer education and training in the pilot countries. It is envisioned that this regional solution will be replicated in other parts of the world.



Case Study: sub-Saharan Africa

There is a drastic shortage of accessible knowledge and quality training programmes in Africa for comprehensive cancer control. In particular, local capacity to train and mentor practitioners within the region is not sufficient to ensure sustainable cancer control and to counter the effects of brain drain. Combined with a lack of financial resources, this scarcity of training opportunities has resulted in a great shortage of trained health professionals, particularly in cancer diagnosis, treatment and care.

The VUCCnet platform has enabled trainees from Ghana, Tanzania, Uganda and Zambia to access a regionally standardized training programme in the area of cervical cancer prevention and early detection. More than 100 doctors and nurses from the four countries have completed the training to date and are now able to perform the life-saving cancer screening.

Training programmes contextualised to sub-Saharan Africa in palliative care, clinical oncology and pathology are currently in development under VUCCnet. These programmes will be accredited by existing local academic institutions.



PMDS – PACT Model Demonstration Sites

Building Global Partnerships

To demonstrate the advantages of a partnership approach to capacity building, the IAEA and WHO implemented an initiative called PACT Model Demonstration Sites (PMDS). PMDS bring together a multitude of partners in a Member State to provide guidance in the development of a cancer control programme. Interventions in a PMDS vary between model sites, in order to ensure that a country's individual needs are met.

By providing support and knowhow from leading cancer control organizations in all aspects of cancer control, PMDS are encouraged and guided in their efforts to move their cancer control programmes in the right direction. There are currently 8 PMDS countries: Albania, Ghana, Mongolia, Nicaragua, Sri Lanka, United Republic of Tanzania, Vietnam and Yemen.



Case study: Mongolia

Cancer ranks second as one of the leading causes of death in the country. Mongolia became the eighth PMDS in 2010, following an imPACT mission in 2009. The mission provided a comprehensive needs assessment of the country's cancer control capacity covering cancer information/registration, prevention, early detection, diagnosis, treatment and palliative care.

The Government's high level of commitment has resulted in considerable progress being made in cancer control. A "General Action Plan on Cancer Prevention and Control (2011-2021)" was prepared and endorsed, as well as a "Strategic Plan for the Development of Radiotherapy 2011-2021". The radiotherapy plan is aligned to the action plan and foresees the expansion of the National Cancer Center (NCC) located in Ulaanbaatar. Efforts have also been made in the area of palliative care to decentralize the services of the NCC in order to make care more available and accessible. The WHO Country Office has provided technical support in the implementation of cancer control activities.

Through PACT, Mongolia has received funding from the United Women's Guild (UNWG) for the construction of a playground for children with cancer at the NCC. In addition, Japan, the Principality of Monaco and the Republic of Korea contributed funds for the improvement of radiotherapy and for the expansion of national palliative care services.

Various health professionals have benefited from training opportunities, such as the cancer prevention and control summer course offered by the US NCI; and by participating in international meetings through IAEA and partners.



How YOU Can Help

*Join us in **Together against Cancer***

by supporting our services to low and middle income countries (LMIC):

imPACT – Integrated Missions of PACT

AGaRT – the Advisory Group on increasing access to Radiotherapy Technology in LMIC

VUCCnet – Virtual University for Cancer Control: Africa Pilot Project

PMDS – PACT Model Demonstration Sites



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