Rays of Hope: Expanding access to cancer care requires innovative financing models

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The Rays of Hope (ROH) initiative was launched by the International Atomic Energy Agency (IAEA) to address global inequities in radiation medicine. Using a multi-pronged approach ROH seeks to support the development and expansion of cancer care and academic infrastructure within low- and middle-income countries (LMICs), as well as support the financing structure to fund these efforts. By leveraging a strong international community and innovative financing techniques, the IAEA hopes to support LMICs in developing and strengthening a sustainable, integrated system to provide quality cancer care.

Rays of Hope (ROH) *(1)* was developed by the International Atomic Energy Agency (IAEA) to address the global geographic inequities of radiation therapy delivery in the context of comprehensive cancer control. Drawing on its international resources and infrastructure, the IAEA aims to support low- and middle-income countries (LMICs) in developing or expanding a system to provide comprehensive and sustainable cancer care. This initiative will contribute directly to the reduction of premature mortality from noncommunicable diseases (NCDs), which is a component of the 2030 Sustainable Development Goal of healthy lives and well-being for all *(2)*.

Cancer care from diagnosis to management is a resource-intensive process requiring a wide range of specialties and access to both technologic and human resources. Diagnostic imaging and nuclear medicine are both integral parts of cancer detection and prognostics. Radiation therapy, an essential modality required in a majority of curative and palliative cancer cases, also requires an extensive infrastructure for access and delivery *(3)*. Despite the importance of both diagnostic and therapeutic radiation modalities, there is a vast global disparity in the availability of both.

The rapid rate of technological advance also necessitates the development of a strong academic infrastructure. This ensures cancer care that involves the most recent advances in technology and equipment, corresponds accordingly with the research. To aid this goal, ROH will designate "anchor centres", which will serve as sources of support and expertise for facilities in the region.

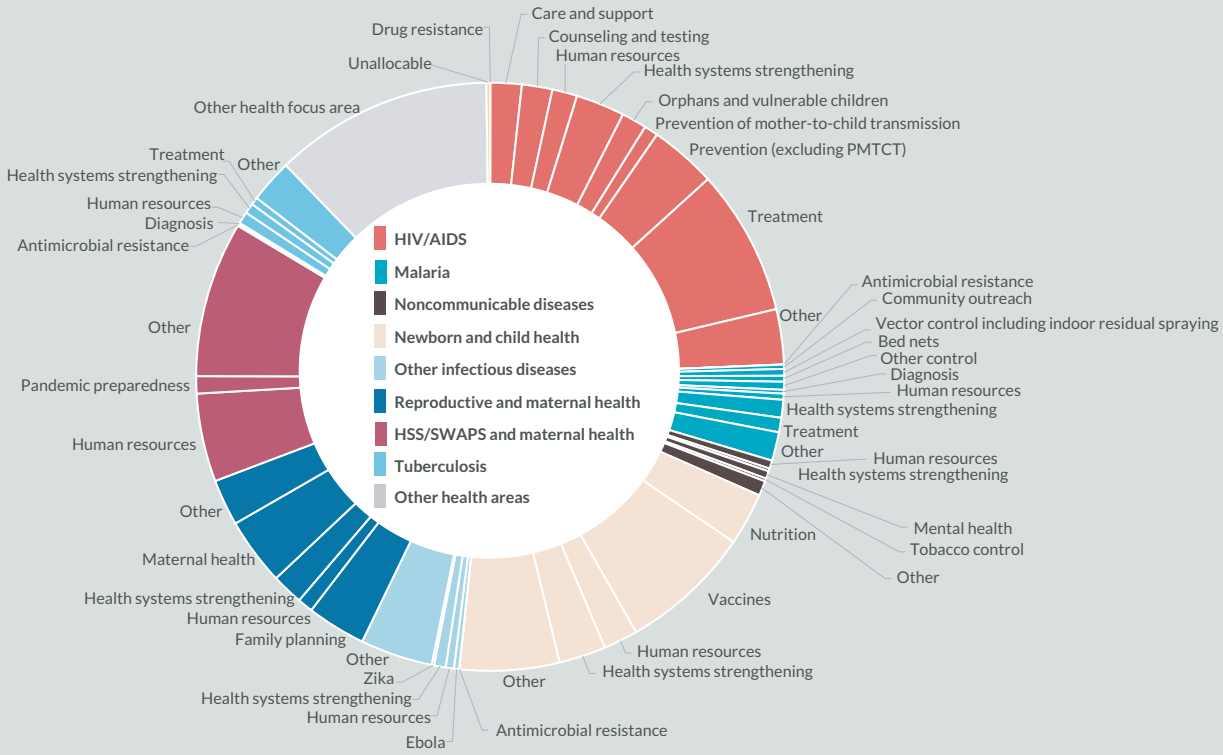
Novel approaches to financing these investments are sought under the ROH umbrella. The key to this approach is the engagement of the IAEA Member State initiating or expanding radiotherapy access to ensure appropriate local implementation and integration into the cancer care infrastructure and the health system at large.

Rays of Hope infrastructure

The early detection of cancer and the delivery of evidence-based cancer care requires a comprehensive array of tools and expertise. Diagnostic tools required for the timely detection of cancer include, among others, diagnostic imaging and nuclear medicine. The early detection of cancer not only increases the probability of curing the disease, but furthermore decreases the overall individual and societal cancer burden by preventing downstream morbid interventions and inpatient-based care. In addition to their roles in early detection, these modalities also play a role in guiding accurate treatment decisions and techniques.

Radiation treatment itself also requires an extensive logistical infrastructure. Experts in the field are required to determine

Figure 1: Official development assistance in health 2000–2018 *(8)*. The total development assistance for health has seen an overall increasing trend since 1990, ranging from less than US$ 8 billion in 1990 to over US$ 38 billion in 2017 and 2018 *(10)*. However, NCDs, including cancer (represented in black) accounted for only 2% of the total share over the 2000–2018 period



the clinical necessity of radiation therapy and ensure the safe and accurate delivery of treatment. The technology used to deliver treatment requires frequent maintenance and quality assurance.

ROH will use available information on comprehensive national cancer control capacity, including imPACT Review *(4)* and IAEA databases (Dirac, Numdab and Imagine) *(5,6,7)*, along with discussions with Ministry of Health officials. All inputs to assess the level of support required for the country's cancer programme in radiation medicine are considered and integrated into the existing cancer care infrastructure and strategies. In addition, innovative approaches to resource optimization, education and anchor centres are an essential part of ROH. The IAEA hopes to support Member States to establish their first radiotherapy centre or to strengthen and upgrade their existing centres to increase access to care. Monitoring and evaluation programmes will provide feedback on the programmes and offer insights into methods of improvement.

By providing support for the cancer care infrastructure, ROH hopes to assist Member States with augmenting their current facilities and increasing capacity, thereby providing sustainable, resource-optimized management of cancer using radiation medicine. Strengthening the diagnostic radiology, nuclear medicine and radiation therapy infrastructure would significantly optimize cancer care diagnosis and treatment delivery, therefore addressing some of the gaps in cancer management affecting their population.

A robust academic infrastructure is also required to provide quality cancer care, as the rapidly evolving field of oncology requires continuous education and training of skilled professionals. Cancer centres should be equipped with technology and software to deliver high-quality care, and the patient care team should similarly be kept abreast of evidence-based medicine to deliver appropriate and effective care.

ROH plans to establish "anchor centres" and support their role within the region. Anchor centres are expected to exhibit long-term commitment to cancer care delivery within their region and support of IAEA activities. They must demonstrate established capabilities in providing comprehensive cancer services, as well as dedication to furthering the formal education of their care teams.

While education and training are important to optimize the human resources delivering quality care, research and innovation are also critical to helping contextualize a cancer programme to the specific region. Through ROH, Member States may develop applied research projects that can be reviewed and discussed through the Coordinated Research Programme (CRP).

By providing support for the academic infrastructure of

a Member State, ROH plans to help increase the human resource capacity to deliver the highest quality care to the region. Identifying anchor centres and enhancing their capacities would allow them to serve as a valuable resource for regional cancer facilities. In addition, supporting current and new research efforts would help provide innovative solutions to provide efficient and contextualized care for its population.

Addressing challenges in financing cancer care

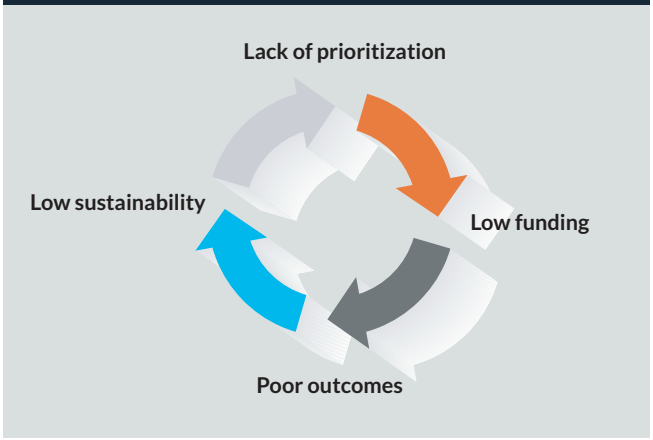
The needed infrastructure mentioned above requires investments an order of magnitude or more above current IAEA Technical Cooperation Project budgets. Therefore, IAEA is reaching out in partnership with our Member States to our traditional donors, as well as approaching non-traditional donors, to develop innovative approaches to finance these activities. This need for expanded funding is in the context of limited development assistance for NCDs and the funding required for COVID-19 recovery.

Out of the total development assistance provided in healthcare to countries from 2000 to 2018, NCDs received only 2% of the share (Figure 1; black bars in the pie chart) *(8)*, which is in stark contrast to the growing burden of disease accountable to cancer and other NCDs *(9)*. Cancer, one of the NCDs considered in the funding chart, accounted for a negligible share of development assistance. In addition, these funds are often directed to prevention and screening. Investments in cancer diagnosis and treatment, therefore, remains grossly underfunded in LMICs.

Much needed attention and prioritization for investing in resources for cancer care has been affected by a "cancer is expensive" mindset among policy-makers and budget holders (8). This is not surprising given the amount of time, effort and investment required to adequately implement resources for comprehensive cancer control, especially in low-resource settings. However, lack of prioritization coupled with low funding often leads to poor outcomes and low sustainability, further reinforcing the lack of prioritization in cancer care (Figure 2).

The IAEA contributes to increasing the prioritization of cancer care through country-level cancer control assessments and recommendations in collaboration with national and international partners, including the World Health Oragnization (WHO) and the International Agency for Research on Cancer (IARC) *(4)*. As a follow-up to the assessment reviews, IAEA, WHO and IARC also provide advisory support in integrating the recommendations into comprehensive national cancer control plans and strategic funding documents (bankable documents) to consider available resources and possibilities to reduce the cancer burden *(11)*. This ensures that ROH is implemented within a comprehensive cancer care delivery system, with a greater likelihood of sustainability and overall impact on the cancer burden.

Figure 2: Challenges in funding cancer care. Lack of prioritization at national and international levels can lead to low resource allocation and funding for cancer care. That compromises impactful outcomes and sustainability, which in turn can reinforce prioritization in other areas of health that generates short-term health impacts and deprive much-needed funding for cancer control



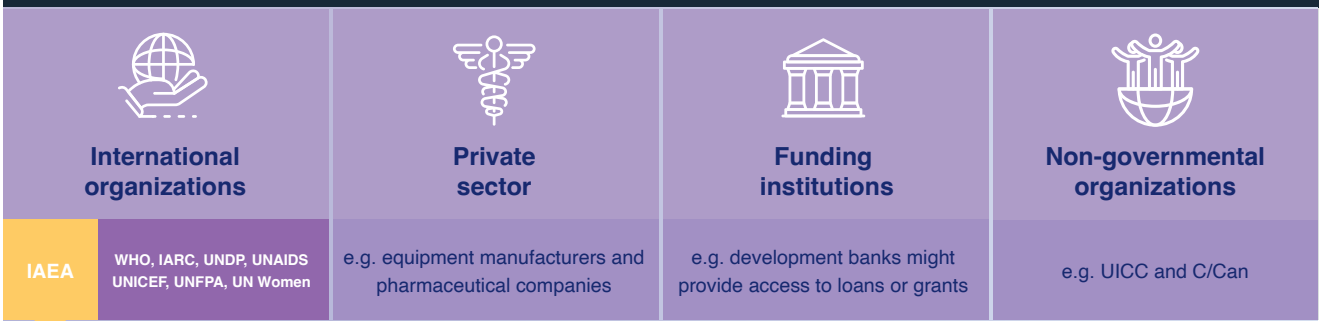
ROH aims to overcome the challenges in funding by strengthening existing IAEA donor engagements and exploring opportunities with new partners. Significant resources are needed to improve global equity in access to life-saving cancer treatment. The goal of ROH is to bring together a global coalition of partners, both traditional and non-traditional, to support countries to establish and sustain radiotherapy centres and scale up existing capacities *(12)*. This way, IAEA targets all the aspects shown in Figure 2 to create a virtuous cycle of improved financing and cancer control outcomes in recipient countries through ROH.

Traditional and non-traditional donor engagement

The IAEA has a long history of providing cancer control training, advisory support and equipment to Member States through its Technical Cooperation Programme. Funding is available largely through contributions from IAEA Member States, which has been relatively consistent over the years. However, the annual financing gap needed to achieve the health targets of the UN Sustainable Development Goals (SDGs) exceeded US$ 370 billion in 2017 *(13)*. And, as more countries express interest in joining forces under ROH, the funding needs specifically for radiation medicine will also grow. Therefore, it is imperative to build upon existing donor engagements, as well as exploring new opportunities and mechanisms for funding the gap in cancer care in LMICs.

In that vein, IAEA is seeking to expand its partnership with international financial institutions (IFIs), which are a major source of funding for developing countries. For example, the Government of Uzbekistan was able to secure concessional loan amounting to US$ 80 million from the Islamic Development

Figure 3: **Global coalition of partners for Rays of Hope comprising international organizations, donor countries, private sector, funding institutions and NGOs *(22)*. The coalition also includes traditional donor Member States. The identified needs of Rays of Hope countries will be matched with partner priorities to provide lifesaving equipment and human resources training in countries with low access to radiotherapy and related technologies**



Bank (IsDB), an IAEA partner, to support expansion of access to cancer diagnostics and treatment, in addition to other cancer service enhancements. This loan is coupled with a US$ 40 million government contribution for the improvement of oncology services *(14)*. The IAEA and WHO provided technical support to the Government of Uzbekistan in conducting a detailed feasibility study and to develop a bankable document, which was used to secure the concessional loan from IsDB. The IAEA is reaching out to other IFIs and regional development banks to expand this type of non-traditional financing mechanism for meeting the targeted needs of ROH.

In July 2022, IAEA also signed a new partnership agreement with GE Healthcare, one of the major private providers of healthcare technology and consulting, under ROH *(15)*. Within the framework of this partnership, GE Healthcare will provide in-kind support in training radiologists and nuclear medicine professionals from ROH countries in diagnostic imaging to detect cancer. To build upon this private sector partnership and expand the coalition of partners for ROH, IAEA has welcomed discussions with the relevant entities in the private sector. This includes through Corporate Social Responsibility opportunities, through associations of private sector members (International Federation of Pharmaceutical Manufacturers and Associations, [IFPMA]) *(16,17)*, and foundations (Global Access to Cancer Care Foundation, [GACCF]) *(18)*.

Building a coalition of funding partners

In July 2022, the IAEA organized a high-level donor roundtable for ROH, which was attended by Permanent Representatives and senior officials from Permanent Mission of IAEA Member States in Vienna. In the first roundtable of its kind after the launch of the initiative, six countries pledged more than €9 million to the initiative *(19)*. Since then, the number of countries interested in ROH has continued to grow, with more Member States expressing interest in participating. The IAEA has received additional pledges from donor countries, and the pool of available funds for allocation has continued to grow.

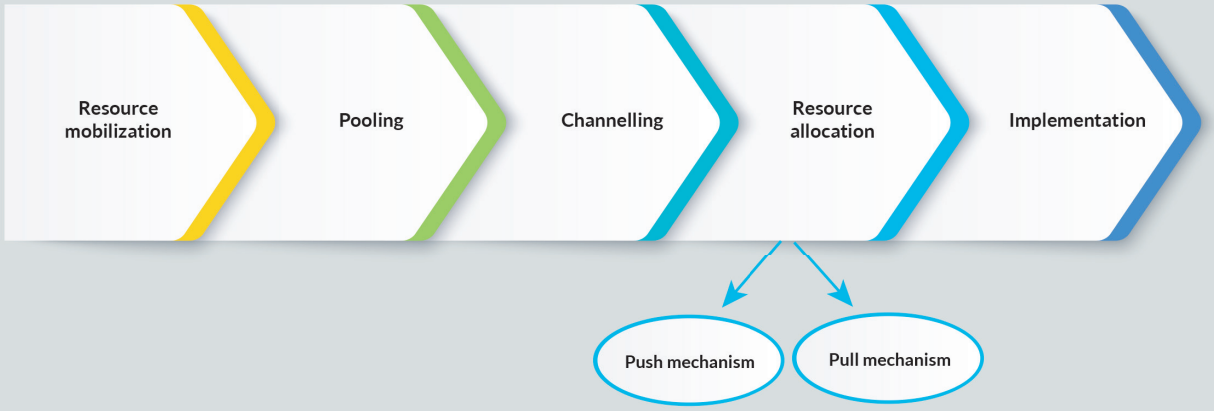
The coalition of partners for ROH is envisioned to comprise donor Member States, international organizations, private sector, international funding institutions, and nongovernmental organizations (NGOs) (Figure 3). The donor coalition, as represented in Figure 3, would also provide an opportunity to fund ROH countries through a multi-stakeholder, blended financing, which brings together a diverse set of organizations from the public and private sectors, including financial institutions, to mobilize additional finance towards achievement of the SDGs in developing countries *(20)*. With increasing interest in the health sector (SDG3) *(21)*, blended finance is likely to play a crucial role in filling the increasing funding gap as more countries become part of ROH.

With this envisioned approach, ROH provides an opportunity to innovate financing approaches. With a global coalition of donors from diverse sectors, ROH continues to identify and welcome new sources of funding, pooling funds to support governments based on their needs. This already presents a significant step towards innovation along with resource mobilization, pooling, and channelling in the value chain framework for ROH (Figure 4) *(23)*. As the initiative matures, careful thought will be given to exploring innovative mechanisms across resource allocation and implementation of projects in specific countries, aspiring to utilize available mechanisms that improve effectiveness and efficiency of development projects in the health sector in international settings.

Conclusion

The IAEA created ROH to address the lack of equity in access to cancer care, specifically radiation medicine, in LMICs. By using a multi-pronged approach, the IAEA will continue to use its expertise to empower and partner with Member States to address the cancer epidemic by providing equipment and training to initiate new centres or upgrade existing ones. In addition, ROH will support innovation for resource optimization, as well as anchor centres to serve as regional resources. All of this will only be possible through a focused effort to bring new partners, with new financial resources, to

Figure 4: **Value chain framework for innovative financing** *(23)*



the table. The Member State seeking to enhance this capacity needs to be at the centre of these partnerships to ensure implementation in accordance with local needs. Through this coalition with Member States and partners, the IAEA seeks to narrow the gap of cancer care delivery around the world. ■

Victor Sapkota is an international development enthusiast with professional working experience in Austria, Nepal, United States and Zambia in international non-profits and organizations within the UN system. Most recently, he worked with the Programme of Action for Cancer Therapy at the International Atomic Energy Agency to support resource mobilization of technical cooperation projects related to cancer control in its Member States, with a particular emphasis on low- and middle-income countries. With a graduate degree in International Political Economy and Development from Fordham University, New York, USA, he is passionate about addressing needs of developing countries through international cooperation to ensure inclusive and sustainable development.

Becky Lee is an intern with the Division of Human Health at the International Atomic Energy Agency. She is also the Chief Radiation Oncology Resident at Loma Linda University in California, USA. Having studied global health at the Harvard T H Chan School of Public Health, she has a strong interest in cancer centre development and expansion in low- and middle-income countries. Most recently, she served as co-Chair of the Global Health Subcommittee in the Association of Residents in Radiation Oncology, where she strived to promote interest and education in global oncology among radiation oncology residents.

May Abdel-Wahab joined the International Atomic Energy Agency (IAEA) in October 2014 as the Director of the Division of Human Health (NAHU). She has served as a member and chair, on various national and international committees, including the United Nations Interagency Task Force Steering Committee (UNIATF) on Prevention and Control of Non-Communicable Diseases (NCDs), which coordinates UN-wide activities in NCDs and was Chair of the ASTRO Committee for Healthcare Access & Training and co-Chair of the Integration of Health Enterprise in Radiation Oncology (IHE-RO) Planning Committee, working on interconnectivity issues at various levels of patient care. Dr Abdel-Wahab is a member of the UN Joint Programme on the Cervical Cancer Control Steering Committee, working at the global and national level with participating countries to support a national comprehensive cervical cancer control programme. She is co-lead author on the Lancet Oncology Commission report on Imaging and Nuclear Medicine and the current co-leader of the radiotherapy and theranostics Lancet Oncology Commission.

Lisa M Stevens joined the International Atomic Energy Agency (IAEA) in June of 2019 as the Director, Division of Programme of Action for Cancer Therapy (PACT). Her experience in partnership building and National Cancer Control Plan development drew her to this position. Prior to joining the Agency, Ms Stevens spent 24 years in various roles at the US National Cancer Institute (NCI). Lisa co- founded the International Cancer Control Partnerships in 2012 to organize multiple global partners working with stakeholders in cancer control. This partnership focused on collating published cancer control and NCD plans as well as other tools. In September of 2018 a global review of plans was published in Lancet Oncology.

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