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Factors Affecting Sustainability of Global Oncology Interventions

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With more than 19 million new cancer cases and 10 million cancer deaths estimated worldwide in 2020, cancer is now the second leading cause of death.¹ The incidence is projected to surpass 30 million new cases by 2040.² The majority of cancer cases occur in low- and middle-income countries (LMICs), where barriers in access to cancer services – including prevention, screening, diagnosis, treatment, and palliative care – are a major challenge.³ Barriers also exist in high-income countries (HICs); however, access is disproportionately lower in LMICs, with more than 90% of HICs reporting that cancer care services are generally available, as compared to 30% of low-income countries (LICs).^{4,5} In recent years, cancer, along with other non-communicable diseases (NCDs), has become a priority issue in global health, with increasing initiatives related to cancer control. Importantly, these initiatives feature cancer treatment, including radiation therapy. Additional challenges are now facing the cancer community since many resources have been used to address the Covid-19 pandemic. While virtual interventions have increased, even these have limitations and are only appropriate in certain scenarios.⁶

The International Atomic Energy Agency (IAEA) organized the International Conference on Advances in Radiation Oncology (ICARO-3),

which took place February 16-19, 2021, and was held virtually (<https://iaea.mediasite.com/Mediasite/Channel/2fb08c0afdb44d-baa981513266acff8a5f>). The conference was the third of its kind, with its predecessors ICARO-1 and ICARO-2 held in 2009 and 2017, respectively. The ICARO conferences address recent advances in radiation therapy techniques and current clinical applications to radiation oncology, radiation biology, and medical physics, and provide a platform to discuss challenges in implementation of cancer care.

Within the conference was a panel session titled *Opportunities in Addressing Global Cancer Challenges*, which had an objective of examining challenges and associated solutions in implementing cancer care in diverse settings globally (<https://iaea.mediasite.com/Mediasite/Play/d6dd1dc4f2834d80a7c8a92eae18c-39c1d>). The panel was designed to represent a variety of settings where sustainable success of cancer centers and their programs have occurred. The panel included examples from HICs, LMICs, as well as multiple international and globally reaching organizations.

Several common themes emerged during the panel discussion, including coordination of efforts; political support, local engagement, and funding; human resources; decentralized care; education, research, and information technology; and quality assurance and safety.

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Factors that limit the sustainability of cancer care interventions were discussed. In addition to describing challenges, the panel also sought to offer solutions to these commonly encountered barriers based on their own experiences in implementing cancer services.

Coordination of Efforts

One theme that emerged from the panel was the need for better global coordination of efforts to facilitate a more efficient use of resources. Coordination can occur at the local, national, regional, and global levels. Programs initiated by international organizations can improve coordination of efforts globally. For example, the WHO Global strategy to accelerate the elimination of cervical cancer is the first initiative that focuses on eliminating a specific cancer, and addresses the full spectrum of disease, from prevention and diagnosis to treatment.⁷ Additionally, the United Nations (UN) Joint Programme on Cervical Cancer Prevention and Control, a multi-agency collaboration of 7 UN agencies, has the same common goal.⁸ Other recently launched initiatives include the Global Breast Cancer Initiative and the Global Initiative for Childhood Cancer.⁹ These initiatives may lead the way for other cancer-related initiatives and facilitate a cohesive global approach to addressing cancer control care. In addition, global implementation of projects through various agencies including the IAEA is essential in realizing progress on the ground.¹⁰ Local coordination through multi-stakeholder engagement that is approved by the local government can support the cancer control plan, coordinate donations, and provide technical support in accordance with priorities of specific cities through initiatives such as the City Cancer Challenge (C/Can),

A second approach to unify efforts is through Lancet Commissions. The Lancet Commissions seek to identify large topics of importance and address them on a global scale and can be used to meet the challenges that were presented by the panel. In total, 70 Lancet Commissions have been published, of which 11 have been published by the *Lancet Oncology* journal, with each commission containing multiple publications relevant to the topic.¹¹ Commissions have ranged from addressing global access to radiation therapy, medical imaging and nuclear

medicine, pediatric cancer care, palliative care, and region-specific cancer care, among others.¹¹ Each of the Lancet Commissions has had a wide-reaching impact and is cited frequently in global cancer care publications, and initiatives and can be used as a resource by policymakers.

Political Support, Local Engagement, and Funding

Obtaining political support and funding, and engaging with the local community, was another theme that arose as an important factor to sustainable interventions for cancer care. Funding is a necessity in any program or intervention, as is political will, and these often go hand in hand. The importance of trying to align goals with those of the local government and the national comprehensive cancer control plan and considering a financial model prior to developing services was emphasized.

Different cancer services around the world have different models of funding, which vary widely. As a possible solution, in addition to government-funded programs, the panel presented a model of philanthropy-based funding, which allows all patients to be treated free of charge or can supplement existing funds. While many hospitals and cancer centers around the world receive some funding from philanthropic sources, a few receive significant funds from philanthropic sources. Examples of primarily philanthropically funded hospitals include the Children's Cancer Hospital Egypt 57357 and King Hussein Cancer Center in Jordan.

When considering local partnerships and engagement, nongovernmental organizations (NGOs) play an important role in cancer care models and as community partners, particularly in the context of long-term partnerships. The panel described examples of partnerships with NGOs, both smaller local NGOs as well as larger international NGOs that resulted in increased donations and sustained collaborations in general.

Human Resources

Human resources availability emerged as another common barrier to cancer care in many settings. Repeatedly, the panel described that often the variety of human expertise



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required to provide oncology services is not available. One major reason for this is that trained personnel may move to find better opportunities for career advancement or earning potential, a phenomenon known as human capital flight, or brain drain.

Several approaches to overcome human capital flight were found to be successful in the different settings represented by the panel. For example, offering an appropriate salary and benefits to health care personnel creates stability and a significant impact on retention. An important issue is the allocation of sufficient funds as a first step to offering competitive and fair salaries. In addition, the panel highlighted the importance of rewarding good outcomes through a value-based health care approach. Enhanced retention of health care providers was also achieved by creating an environment where teamwork is encouraged, such as through implementation of disease-specific teams.

Decentralized Care

Cancer care is often focused within major urban centers, with rural populations experiencing decreased access to care. This is true of both HICs and LMICs, though this disproportionately affects patients in LMICs due to already limited resources. One approach to address this is the hub-and-spoke model, which has been successfully implemented in India. The model revolves around “hubs,” which are larger hospitals with advanced facilities and technologies capable of treating rarer cases, and “spokes,” which are smaller hospitals connected to “hubs,” which are equipped to treat the most commonly diagnosed cancers.¹² The model has been implemented by Tata Memorial Centre, with plans to expand throughout India to each state.

There are multiple benefits of the hub-and-spoke model. The model provides access to treatment for a substantially larger number of patients than was previously possible. It addresses several barriers typically present with rural populations, namely costs and barriers related to transportation needed to access cancer care.¹² Other benefits include improved consistency across centers, increased efficiency, and enhanced quality. As described by the panel, each “hub” and each “spoke” facility will enable every individual

to receive evidence-based treatment, with costs determined by ability to pay, including subsidized options.

Education, Research, and Information Technology

Education and research programs within cancer care models were recognized as especially important in ensuring the timely adoption of innovation and sustainability of interventions. While frequently considered too costly, they support continuous progress in cancer control efforts. In conjunction with this, embracing modern information and communication technology should be a priority, as it relates to e-learning platforms, data collection, information systems, hospital registries, medical records, and telehealth platforms, among others. Funding and regulation related to education and research can be fragmented because they often belong to different jurisdictions or ministries.

One approach is implementation or harnessing of virtual education, which has been especially useful during the Covid-19 pandemic. Virtual educational initiatives increase the number of attendees and reduce associated travel costs for trainers and trainees. While used pre-pandemic, these initiatives have been greatly expanded during the pandemic, and will likely be expanded in the future. Virtual care has also been instrumental during the Covid-19 era, especially for patients with otherwise difficult access to care.⁶

Accurate information is crucial for planning and outcomes assessment. Cancer registries represent an opportunity to collect important data and enable data storage, analysis, and guide cancer programs in a region or specific center.¹³ Registries are critical for facilitating epidemiologic research, outcomes, policy and programmatic planning. Both hospital-based and population-based cancer registries play important roles.¹³

Resource-sparing research can provide many opportunities to enhance access to care. In addition, exploring low-cost interventions, including repurposing of drugs, and harnessing the relationship with industry to manufacture state-of-the-art equipment can make technology and medications more affordable.

Quality Assurance and Safety

A final theme that emerged was the importance of quality assurance and safety. Quality assurance and safety are priority considerations in all settings, and multiple guidelines for quality assurance and safety have been published by the IAEA such as in radiation therapy and nuclear medicine.^{14,15}

Solutions presented by the panel represent approaches that have been successfully utilized in different real-life settings both in HICs and LMICs. These solutions were developed in response to challenges affecting sustainability of oncology services. Dissemination of effective solutions is necessary to work toward the common goal of providing all patients across the globe access to evidence-based, high-quality cancer care. Despite the many common challenges that we face as a global oncology community, this panel has illustrated that the collective momentum in improving cancer care for all is unprecedented and that the multiple challenges can be overcome to improve access to cancer care and attain sustainability.

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