



Overview

Mobilising Expertise and Resources to Close the Radiotherapy Gap in Cancer Care



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Abstract

Closing the gap in cancer care within low- and middle-income countries and in indigenous and geographically isolated populations in high-income countries requires investment and innovation. This is particularly true for radiotherapy, for which the global disparity is one of the largest in healthcare today. New models and paradigms and non-traditional collaborations have been proposed to improve global equity in cancer control. We describe recent initiatives from within the radiation oncology community to increase access to treatment, build the low- and middle-income countries' radiation oncology workforce, mobilise more professionals from within high-income countries and raise awareness of the global need for equitable cancer care.

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Statement of Search Strategies Used and Sources of Information

This article was written in collaboration with radiation oncologists working within global health settings and reflect expert opinion. No formal search strategy was employed.

Introduction

Low- and middle-income countries (LMICs) are estimated to have only 5% of cancer care resources, yet account for 80% of the disability-adjusted life-years lost to cancer [1].

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Although radiotherapy is one of the essential cancer treatment modalities used in more than half of all cancer cases in high-income countries (HICs), over 90% of individuals in low-income countries have no access to radiotherapy [2,3]. Even in resource-rich countries, radiotherapy and other specialised oncological services are typically concentrated in large urban settings, leaving populations living in rural or remote settings vulnerable to cancer disparities [4–7].

As we begin to develop evidence to support long-term investment in radiotherapy for LMICs [8], we must also carefully consider the long-term sustainability of physical and human capital required by radiotherapy programmes in resource-limited regions. This includes developing and supporting global initiatives that have been created to engage with non-governmental organisations (NGOs), governments, industry partners and academic institutions. Here we describe current efforts to sustainably foster

medical expertise and robust radiotherapy centres in LMICs and remote areas of HICs. We review the existing challenges to mobilising expertise and resources to these regions and highlight potential innovative solutions.

Mobilising the Radiation Oncology Community

Unsubstantiated assumptions about the affordability and feasibility of radiotherapy in low resource settings have severely limited efforts to improve access. For this reason, the Board of the Union for International Cancer Control convened the Global Task Force on Radiotherapy for Cancer Control (GTFRCC) in 2013 to raise awareness about the dramatic inequalities in radiotherapy access and to develop an economic platform to support national and international investment. The GTFRCC published a report in *Lancet Oncology* in 2015 that detailed the demand for radiotherapy, the cost of building infrastructure and training professionals to deliver radiotherapy, and the financial return on investment at a macroeconomic level [8]. This report was the culmination of a collaborative effort of over 100 experts from around the world across radiotherapy, industry, cancer control and economics. Building on the momentum generated by the report, the European Society for Radiation Oncology (ESTRO) is developing a global partnership of organisations to continue to work on improving radiotherapy investment in LMICs.

One of the Calls to Action in the GTFRCC report was for 7500 radiation oncologists, 20 000 radiation therapists and 6000 medical physicists to be trained for LMICs by the year 2025. Accomplishing this will require a creative and substantial multipronged effort, a research and implementation challenge as significant as that of the more classical academic research tracks. At present, many LMICs lack appropriate education and training programmes and do not have the expertise, resources or personnel to provide practical on-the-job training. Success in the creation of an educational programme to develop a trained workforce will require collaboration among international, national, regional, local and NGOs [9].

Global Health as a Career Path in Radiation Oncology

It is yet unclear how LMICs will find educators to train more radiation oncologists, physicists and radiation therapists to fill this important need. Although many retiring oncologists have devoted their post-practice years to this calling, the clinical and financial demands on those who are still in practice often preclude dedicated global health work. Furthermore, despite growing interest among oncologists, global oncology is still not well recognised and supported as a career path [10]. As a result, the engagement of trainees and early career faculty in resource-poor settings has often been limited to self-funded, small-scale projects. This model of global health work in largely uncoordinated single-person silos during ‘free time’ is minimally effective and not sustainable.

‘Value’ in HIC oncology departments has traditionally been quantified by revenue and research generation. Yet, growing recognition of the global inequities in cancer care resources has led many to reconsider how to support and assign ‘value’ to radiation oncologists addressing this important problem. Academic centres with global health departments are now beginning to pursue multidisciplinary partnerships to make sustainable and impactful contributions. One such example is University of Pennsylvania’s commitment to support one of their staff radiation oncologists to work full-time with the local team at Princess Marina Hospital in Botswana to develop oncology research, teaching and clinical care infrastructure.

Academic careers in global oncology have expanded to fields such as implementation science, care coordination, epidemiology, cancer biology and the development of low cost and point-of-care interventions. This work can be partially carried out on the ground in LMICs or may take place remotely when personal or professional commitments do not allow such time away from the home base. Faculty members who are on the ground in locations distant from their home site require professional support, which may occur through telemedicine access, case review, data management and statistical resources, remote didactic lectures, and multidisciplinary input on training plan protocols and care guidelines. A more robust academic approach, with quantification and publication of findings, will help build an evidence base that can be more broadly appreciated.

Opportunities for trainees to engage in global health are also expanding. The Global Health Rotation Initiative was launched in 2015 by US and Canadian radiation oncology residents to facilitate international educational exchanges for trainees [11]. A database of global radiation oncology organisations with resident elective opportunities is hosted on the online radiotherapy community website, www.globalrt.org [30]. Radiation oncology residents can rotate at diverse sites. For example, the Christie NHS Foundation Trust in Manchester, UK, the Cancer Diseases Hospital in Lusaka, Zambia and Walking Forward, which works with indigenous populations in the USA.

Partnerships to Improve Training within Low- and Middle-income Countries

The development of educational initiatives within LMICs has also been gaining momentum. For many years, the International Education Subcommittee of the American Society for Radiation Oncology (ASTRO) has run an eContouring Ambassador Initiative programme in which designated experts coach others on how to delineate organs and tumours on three-dimensional images [12]. Varian’s educational programme, ‘Access to Care’, prepares staff to operate the equipment that their respective centres have acquired [13]. Varian is now establishing multiple training sites throughout the African continent and individual projects have been implemented with the goal of training the workforce in LMICs. A pilot curriculum for institutions transitioning from two-dimensional to three-dimensional breast conformal

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