RADIATION ONCOLOGY—ORIGINAL ARTICLE

A collaborative approach to meeting oncology challenges in island communities in the Asia-Pacific region

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Abstract

Treatment of cancer in small island communities is frequently challenged by the isolation and scattered nature of target populations, limited economic resources and overburdened healthcare systems. Strategies that have been successful in improving access to nonsurgical treatment in Fiji, Papua New Guinea, Solomon Islands and West Timor include balancing centralised location of scarce resources (particularly health professionals) with minimisation of patient travel, in-country training by teams of oncology professionals from high-income countries (HICs), sending health professionals to train in HICs, sharing and adaptation of treatment protocols, and telehealth initiatives. A common feature of successful initiatives is a collaborative approach. Cancer service design and implementation needs to be led by local health professionals with the collaboration of local health authorities and government. There is greater scope for collaboration between low- and middle-income countries and for the use of virtual meetings, distance learning, and remote technical support.

Key words: chemotherapy; delivery of health care; developing countries; melanesia; radiotherapy.

In low- and middle-income countries (LMICs) cancer is now a major cause of morbidity and mortality and the global burden of cancer is increasingly falling on people living in these countries. In 2012, 65% of cancer deaths were in LMICs; by 2030, this is predicted to rise to 75%.[1]

Oceania and South-East Asia is home to 9% of the world's population.[2] The region includes some of the world's most affluent countries, but it also includes poorly resourced societies, many of which are island communities that face common challenges. A recent Lancet Oncology series of articles on cancer control in small island nations noted that these challenges include geographically dispersed and isolated populations, fragile ecological and economic situations, vulnerabilities to climate change and natural disasters, poor access to treatment and palliative care, and overburdened healthcare systems.[3] Suggested strategies to improve cancer control included prioritising regional collaborative approaches, development of targeted treatment capacity, using innovative approaches to delivering cancer care, maintaining adequate health workforce, and clear referral pathways.

This article describes approaches being taken in Fiji, Papua New Guinea, Solomon Islands and West Timor to improve cancer control, with a particular emphasis on nonsurgical treatment. We hope that this experience can inform efforts in other low-resource communities in the region.

Approaches to meeting oncology challenges in the Pacific

A common feature of successful initiatives is a collaborative approach. High-income countries (HICs) in the region can collaborate effectively with LMIC

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communities, contributing technical expertise, training and equipment. However, differing cancer incidence, distinctive cultures, availability of trained health professionals and economic limitations mean that approaches to cancer management in HICs are not necessarily effective in LMICs. Cancer service design and implementation needs to be led by local health professionals with the collaboration of local health authorities and government.

The case studies below show that successful strategies have included

- balancing health resources and patient travel in determining location of treatment delivery
- telehealth initiatives
- sharing and adaptation of treatment protocols
- scholarships and fellowships for training of LMIC health professionals in HICs
- visits of teams of oncology professionals from HICs to provide in-country advice and training

Fiji

The Republic of Fiji is an upper-middle-income country with a population of approximately 900 000 (57% indigenous Fijians; 37% Indo-Fijian).[4] Most people live on the two main islands, but there are more than 100 other inhabited islands, challenging access to health care. This has been addressed by developing specialist services, including oncology, in divisional hospitals. Ongoing education of health staff through training, oncology unit rotations and specialist outreach programmes has also improved case detection and timeliness of biopsies, diagnosis and management.

A plan for a radiotherapy facility was endorsed by the government in 2014, the need for which has been supported by international organisations, including the International Atomic Energy Agency (IAEA), the World Health Organization and the International Agency for Research on Cancer. A subsequent study suggested that costs may exceed benefits[5], but it has been noted that it did not account for the benefits from promoting health sovereignty, universal health coverage and treating patients from the wider region[6].

In the absence of a radiation therapy facility, the focus is on maximising surgical and chemotherapy facilities. These are available within the three divisional hospitals, with specialists either travelling between centres or communicating through MDTs and IT forums. Specialist teams have also developed international networks stemming from relationships established during training years, through specialist colleges and through regular visits of overseas multidisciplinary teams to Fiji. These networks, mainly involving New Zealand, Australia, India, Korea and New Caledonia, have greatly assisted with clinical decision making and developing management guidelines.

The knowledge and skills gained through training and from external input are also shared with Pacific Island neighbours. This is made possible through pre-existing professional relationships between many of the senior health leaders in the wider Pacific Island community from training through the Fiji National University (FNU) College of Medicine, Nursing and Health Sciences, which is one of the oldest institutions of its type in the Pacific. The resulting networks have facilitated regional collaboration and Pacific specialist colleges set up within the Pacific Island Countries and Territories (PICTs) provide forums where experiences and knowledge are regularly shared, Pacific based training is undertaken, and specific management protocols are updated. The Pacific Community (SPC) plays an integral role in supporting and developing the functions and goals of these organisations.

Despite increases in human resources, demand on health services continues to rise, so specialists still perform general roles while developing their speciality units. Although this has meant slower growth of the oncology unit, adequate staff numbers are maintained for the ever present demand in the general arena. Nevertheless, oncology has been earmarked as an important area to be developed through MOUs with institutions abroad (Australia) for specialist nursing training. The Pacific Islands Program of the Royal Australasian College of Surgeons (RACS) and the Australian Government Department of Foreign Affairs and Trade (DFAT) have facilitated medical oncology training of physicians in Australia and New Zealand. Through other international initiatives, staff have also been able to attend training courses and attachments in specialist centres overseas (India, Korea, and China). Skills gained from these programmes are utilised nationwide and the eventual aim is to have an adequately resourced, dedicated and sustainable oncology team.

Solomon Islands

Solomon Islands is a lower-middle-income country with a population of 686 000 distributed over 9 provinces and 347 inhabited islands. Tertiary medical services are concentrated at the National Referral Hospital (NRH) in the capital city of Honiara on the island of Guadalcanal. Plain x-ray radiology and ultrasound facilities are available and a CT scanner is expected to be commissioned in the next year. The nation does not have a magnetic resonance imaging (MRI) or nuclear medicine service. There are limited histopathology services, no radiotherapy facilities and no intensive care support.[7] Cancer treatment services have been strengthened through collaboration of local health professionals with Australian counterparts, local and Australian NGOs, and Australian oncology facilities.

Prior to a scoping visit of the cancer services in Solomon Islands, funded by the John James Foundation (JJF)[8] in 2016, the administration of chemotherapy was not coordinated. A limited range of chemotherapy was given on the wards without adequate personal protective equipment (PPE) by the registrars under the supervision of the

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respective consultants of the teams that the patients were under. Protocols used were adapted from oncology units in Fiji, Papua New Guinea and Australia.

The Solomon Islands Cancer Registry was staffed by a medical registrar and two nurses.[7] A plan was made to train the registrar to be the nation's medical oncologist and to centralise the chemotherapy administration in one day unit location at the NRH with treatments to be given by the two nurses. The JJF supported a Travelling Fellowship in 2017 for the trainee to undertake a medical observership in the oncology inpatient and outpatient facilities in Canberra and also subsequently for the two oncology nurses in 2019. The Foundation has also awarded a scholarship to the trainee to undertake a Master of Cancer Sciences degree at the University of Melbourne.

The DFAT/RACS Pacific Islands Program funded a multidisciplinary mission of a medical oncologist, haematologist, oncology nurse and oncology pharmacist to visit the NRH in order to build capacity and capability for the NRH Oncology staff in September 2018. [9] In collaboration with the local staff and an AVI (Australian Volunteers International) pharmacist the team reviewed all the treatment protocols being used at the NRH and also developed the Solomon Islands Oncology Guidelines that have been made available on the Therapeutic Guidelines Ltd Solomon Islands Guidelines Host app for smartphones. The team gave priority to protocols that were curative and assisted in making the case for essential drugs to be added to the National Formulary to enable more of these cancers to be treated. Equipment and supplies for giving chemotherapy donated by local and Australian institutions were transported to the NRH by the JJF in collaboration with DAISI (Doctors Assisting In South Pacific Islands)[10]. In-country training was carried out with workshops, lectures, demonstration of workflows especially with complex protocols and use of PPE.

A second DFAT mission was carried out in May 2019 and many of the recommendations of the first mission and initial scoping visit had been adopted. Mentorship of local staff has continued. Other nursing staff have been trained to be able to administer chemotherapy in order to help provide a sustainable workforce. A breast cancer multidisciplinary team meeting has also been recently re-established.

Papua New Guinea

Papua New Guinea (PNG) is a lower-middle-income country with a population of more than eight million. The health service is relatively centralised but only 13% of people live in urban centres[11] and the significant financial burden of transportation and accommodation for patients is generally borne by families.[12] Centralisation of pathology services in Port Moresby also contributes to delays in diagnosis, with reports often being received months after biopsy. There are plans to decentralise cancer diagnosis and treatment with four regional cancer centres, but funding remains a challenge.

Financial and workforce constraints have resulted in discontinuation of previously established cancer-related services. Immunohistochemistry is not available currently, due to a lack of specialists and the high cost of consumables. A WHO-funded pilot project for a national cancer registry in 2014 was not extended, although hospital-based registries continue. Radiotherapy has been provided in PNG since 1953, but there have been interruptions due to reliance on overseas-trained radiation oncologists and visiting overseas physicists. There has been no radiotherapy service since 2016. Furthermore, a Bachelor of Science in Radiation Therapy programme at the Papua New Guinea University of Technology in Lae was discontinued in 2018, since cancer services had not evolved to provide anticipated employment for the graduates.

Collaboration with international partners has been central to cancer control efforts. The IAEA has supported the National Department of Health to draft the Radiation and Safety Control Act and an accompanying regulatory framework, which will allow the IAEA to facilitate replacement of the decayed cobalt source for the teletherapy unit. Novel funding approaches involving multiple government departments and donor agencies have provided the country's first MRI scanner, have supported installation of CT scanners in regional hospitals and are funding a histopathology laboratory, chemotherapy drugs and the recruitment of foreign specialists for the NCC.

In order to standardise cancer treatment and account for local resource constraints, Guidelines for the Treatment of Cancer in Papua New Guinea were published in 1975 and were last updated in 2007.[13] They are still widely used but need revision. More recently, the Paediatric Society of PNG has collaborated with the Royal Children's Hospital (Melbourne) and the National Children's Cancer Network Pacific Island Workstream (New Zealand) to publish standard treatment guidelines.[14]

PNG has well established undergraduate and postgraduate medical programmes at the University of Papua New Guinea (UPNG) School of Medicine and Health Sciences (SMHS), but human resources continue to constrain the development of cancer services. In response, the SMHS is incorporating histopathology into its Master of Pathology programme and a clinical oncology programme is under consideration.

International partners have been engaged to re-establish the radiotherapy service. Australasian radiation oncology professionals have participated in IAEA advisory missions. IAEA fellowships are supporting two medical doctors and two radiation therapists from PNG to undertake specialist clinical oncology training and radiation therapist upskilling at the Zambia Colleges of Medicine and Surgery. The IAEA has also supported medical physicist training in Australia, Malaysia and Italy. PNG's first linear accelerator has been purchased for a new cancer centre under construction at Port Moresby General Hospital.

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West Timor

West Timor forms part of the eastern Indonesian province of Nusa Tenggara Timur (NTT) and has approximately 1.6 million inhabitants. It is one of the most impoverished territories of Indonesia with poor access to medical care.[15]

The Flinders Overseas Health Group (FOHG) is an Australian voluntary group committed to promoting sustainable health through education in NTT for over 20 years.[16] In 2014, an oncology initiative was commenced as part of a programme from FOHG for upskilling in the area of oncology across medicine, nursing, pharmacy, surgery and pathology. The programme aimed to enhance oncology services in West Timor, particularly at the Professor Johannes Hospital (PJH) in Kupang.

The FOHG oncology initiative has included education of oncology service providers from PJH through a sponsored preceptorship programme that brings West Timorese to Adelaide. A corollary component of the programme involves a multidisciplinary team from Australia, comprising experts in medical oncology, oncology nursing, pharmacy and pathology, travelling to Kupang. This team arrives with the support of the hospital and regional health authorities. Achievable goals and resource conscious recommendations are established through on-site evaluation, with engagement of local healthcare providers and administrators. FOHG activities and recommendations have included assessment of available medicines and subsequent development of a Cancer Drugs Policy, a drug supply and procurement policy, a safe drug handling strategy and a clinical pharmacy resource. There has been a focus on coordination of chemotherapy production with pharmacy and a pathway to ensuring optimal timing of treatment delivery and strategies for safe and effective management of chemotherapy and other biohazardous waste. A dedicated oncology ward has been established, with medical led tumour specific multidisciplinary meetings, covering the most common tumours. FOHG has also assisted in the development of pathology services at PJH, including an anatomical laboratory, tele-initiatives for assistance in establishing cancer pathology diagnoses and upskilling of specialist pathologists, to greatly enhance the ability to receive timely diagnoses of cancers. Assessment of hospital infrastructure (with expert assistance from an engineer volunteer) has led to repair of the biohazardous waste disposal system.

Engagement with local government and health administrators in order to achieve change is a critical component of the initiative. Frank discussions allowed identification of areas of need and priority within the hospital for upgrading and support. Local government funding to enhance cancer services have followed meetings with provincial government representatives.

The long-term association of FOHG with PJH, with stakeholder engagement and relationship building, is a key aspect of the initiative. With each visit, relationships are reinforced and consolidated. There remains much to be done but there is a sense of great optimism within the teams of FOHG and PJH.

Common challenges

Small island communities face daunting challenges in providing cancer treatment for their populations. There are general challenges to health care as noted in the introduction. Dispersed populations with limited resources for travel would benefit from decentralised services that can offer cancer diagnosis and treatment close to where they live. However, centralised oncology services require fewer resources to administer, allow accumulation of expertise within staff groups, facilitate training and allow close interaction with other specialist services. A lack of population-based national cancer registries adds to the difficulty in planning service location, as well as prioritising cancer treatments. Capital costs for major equipment, such as scanners and radiotherapy machines, and operational costs for maintenance, chemotherapy drugs and laboratory consumables limit the treatments that can be provided. There is a need for more resource-adapted treatment protocols to ensure that the best use is made of the facilities available. Often the major limitation is not related to finance, however, but to workforce. Local healthcare professionals need to be trained and provided with continuing professional support and education to ensure sustainability of services, which can often be threatened by the migration of skilled staff to wealthier countries. Provision of radiation treatment, in particular, is affected by all these challenges and none of the island communities described has a functioning radiotherapy service, although recent modeling[17] suggests that 29 megavoltage machines are needed to meet current demand in PICTs.

Future developments

There is greater scope for collaboration between LMICs in meeting regional oncology challenges. Examples of successful collaboration include sharing of resource-appropriate treatment protocols, training of health professionals and establishment of transnational specialist medical colleges. The IAEA promotes 'South-South' Technical Cooperation between developing countries[18] and is supporting the training of professionals from PNG in Zambia. Future training of oncology professionals may be able to build on existing relationships between regional educational institutions, such as the UPNG School of Medicine and Health Sciences and the FNU College of Medicine, Nursing & Health Sciences.

The difficulty of travel in the COVID-19 era will also influence future collaborative efforts. Distance learning, attendance at virtual meetings and remote technical support will need to increase if international collaboration is to continue to be effective.

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Teleconferencing and video conferencing technology allows clinicians from Australia and New Zealand to attend Multidisciplinary Meetings and Tumour Boards in a number of LMICs. The experience of the COVID-19 pandemic has normalised such styles of remote working in both HICs and LMICs, and it is likely that they will be used increasingly to support the management of individual patients. A system of Virtual Tumour Boards is being established by the IAEA, with New Zealand as lead country, to promote peer support between radiation oncologists in Asia-Pacific LMICs.

The lack of radiation treatment facilities in these communities is a major gap in cancer services, although slow progress has been made in re-establishing them in PNG and in establishing one in Fiji.

The examples above demonstrate the dedicated activity of many oncology professionals in the region over many years. Often major improvements in cancer services have been achieved through the enthusiasm of professionals from individual institutions, who form personal relationships that sustain progressive development over long periods. There may be opportunities to increase the influence of such work by coordinating parallel projects to minimise duplication and sharing lessons about effective (and ineffective) strategies. A recent IAEA Technical Meeting on Challenges in Global Cancer Care proposed that international efforts to improve access to radiation therapy be registered on the IAEA ORION database. An Asia-Pacific Interest Group within the Clinical Oncology Society of Australia has also been proposed to provide formalised and sustained collaboration between researchers, clinicians and stakeholders.[19]

In conclusion, collaboration between oncology professionals and administrators has resulted in advances in the care of cancer patients in low-resource communities in the Asia-Pacific region, but access to care remains a major challenge for most. The development of services needs to be driven by local health professionals but collaboration with in-country peers and those from regional LMICs and HICs provides the best opportunity to meet this challenge.

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